- California Department of Forestry and Fire Protection
- California State Parks
- California Tahoe Conservancy
- Fallen Leaf Fire Department
- Lake Valley Fire Protection District
- Nevada Division of Forestry
- Nevada Division of State Lands
- Nevada Division of State Parks
- Nevada Tahoe Resource Team
- North Lake Tahoe Fire Protection District
- North Tahoe Fire Protection District
- South Lake Tahoe Fire Department
- Tahoe Douglas Fire Protection District
- Tahoe Regional Planning Agency
- United States Department of Agriculture Forest Service
- Tahoe Resource Conservation District
- Washoe Tribe of Nevada and California

Lake Tahoe Basin

Multi-Jurisdictional Fuel Reduction and Wildfire Prevention Strategy

August 2025

For More Information Contact:

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North Tahoe Fire Protection District	222 Fairway Dr. Tahoe City, CA 96145	April Shackelford	(707) 362-1378
South Lake Tahoe Fire Rescue	2101 Lake Tahoe Blvd. South Lake Tahoe, CA 96150	Jay Manning	(530) 307-3953
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Tahoe Resource Conservation District	870 Emerald Bay Rd. Suite 108 South Lake Tahoe, CA 96150	Annabelle Monti; TFFT Program Manager Cara Moore; GIS Specialist	(530)543-1501 X126 (530) 543-1501 X110
University of Nevada, Reno	1664 N. Virginia St. Reno, NV 89557	Christina Restaino; Director of Living with Fire Program	(775) 336-0272
Washoe Tribe of Nevada and California	919 Hwy 395 North Gardnerville, NV 89410	Serrall Smokey, Tribal Chairman	(775) 265-8680

Cooperating Agencies Letter of Support

July 22, 2025

Federal, state, and local leadership recognize and support the mutual benefits of working collaboratively to reduce fuels to restore resilient forest landscapes and create fire adapted communities throughout the Lake Tahoe Basin. We reaffirm the wide-ranging benefits of community protection work already completed, while recognizing the needed commitment to landscape-scale planning and implementation as the next strategic step forward.

The 2025 update of the Strategy emphasizes continued cooperative fuels treatment strategies to achieve both social and ecological benefits. Therefore, we the undersigned resolve to support and implement the Lake Tahoe Basin Multi-Jurisdictional Fuel Reduction and Wildfire Prevention Strategy with Basin Partners.

Erick Walker, Forest Supervisor U.S Forest Service – LTBMU	Gary Gerren, Fire Chief Fallen Leaf Fire Department
Mike Blankenheim 7/25/2025 Mike Blankenheim, Chief CAL FIRE Amador-El Dorado Unit	Chad Stephen, Fire Chief Lake Valley Fire Protection District
Brian Estes 7/24/2025 Brian Estes, Chief CAL FIRE Nevada-Yuba-Placer Unit	(acting for) Robert Griffith, District Superintendent California State Parks
Ryan Sommers, Fire Chief North Lake Tahoe Fire Protection District	Jason Vasques, Executive Director California Tahoe Conservancy
Steve Leighton 7/28/2025 Steve Leighton, Fire Chief North Tahoe Fire Protection District	Kacey KC, State Forester Firewarden Nevada Division of Forestry
Jim Drennan, Fire Chief South Lake Tahoe Fire Rescue	Robert Mergell, Administrator Nevada Division of State Parks
Scott Lindgren, Fire Chief Tahoe Douglas Fire Protection District	Mike Vollmer, Executive Director Tahoe Resource Conservation District
Julie Regan, Executive Director Tahoe Regional Planning Agency	Serrell Smokey, Chairman Washoe Tribe of Nevada and California
Charles Donahue, Administrator Nevada Division of State Lands	

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- Lahontan Regional Water Quality Control Board
- Lake Valley Fire Protection District
- Nevada Division of Forestry
- Nevada Division of State Lands
- Nevada Division of State Parks
- Nevada Tahoe Resource Team
- North Lake Tahoe Fire Protection District
- North Tahoe Fire Protection District
- South Lake Tahoe Fire Department
- Tahoe-Douglas Fire Protection District
- Tahoe Regional Planning Agency
- Tahoe Resource Conservation District
- USDI Bureau of Land Management
- USDA Forest Service, Lake Tahoe Basin Management Unit
- Washoe Tribe of Nevada and California

Roles and Responsibilities

Table 1 summarizes the roles and responsibilities of individuals and agencies involved with wildland fire management and prevention in the Basin. All individual landowners and most agencies have land management responsibilities. This includes identifying concerns on parcels under their ownership or administration and recommending and implementing actions that remedy those concerns.

Regulatory responsibilities include promulgating and enforcing laws and regulations related to fire mitigation treatments. Many entities provide funding to plan or implement projects. Programmatic oversight refers to the agencies that are responsible for program management related to fire mitigation projects.

Table 1: Summary of roles and responsibilities of agencies and individuals to implement the Strategy.

Agency	Land Management	Regulatory	Funding	Programmatic Oversight
Individual Landowners	X		X	
Tahoe Regional Planning Agency		X	X	X
USDA Forest Service-LTBMU	X	X	X	X
Fire Protection Districts & Departments	X	X	X	X
California Tahoe Conservancy	X		X	X
CAL FIRE		X	X	X
California State Parks	X		X	X
Lahontan Water Quality Control Board		X		
Nevada Division of Forestry	X	X	X	X
Nevada Division of State Parks	X		X	
Nevada Division of Environmental Protection		X		
Nevada Division of State Lands	X		X	X
Washoe Tribe of Nevada and California	X		X	X

Tahoe Fire and Fuels Team

The Tahoe Fire and Fuels Team (TFFT) was established in response to the 2007 Angora Fire. In the aftermath, the governors of California and Nevada convened the California-Nevada Tahoe Basin Fire Commission to assess the factors affecting fuels reduction in the Lake Tahoe Basin. Ultimately, recommendations fell into several categories including education and outreach, policy, funding, government structures, and environmental practices. The Commission's final report emphasized the importance of multi-jurisdictional collaboration to coordinate fuels reduction projects, secure and manage funding, and implement priorities outlined in the community wildfire protection plans.

Picture 1: Tahoe Fire and Fuels Team Logo

Eighteen years later, land management in the Basin has shifted significantly. Wildfire preparedness and fuels management remain top priorities, but the complexity of collaboration has increased. With extensive wildland urban interface (WUI) and record levels of visitation and recreation, the TFFT is focused on implementing strategic fuels treatments to protect critical infrastructure, creating contiguous buffers around the WUI and evacuation routes, and communicating and educating the public on the importance of fuels reduction and wildfire risk reduction activities.

Oversight of the TFFT is provided by the Multi-Agency Coordinating Group (MAC), composed of the chief executives of the signatory agencies to this Strategy. The MAC provides strategic direction and political leadership for the TFFT, approves annual work plans, and assists with identifying funding opportunities. The Fire Public Information Team (Fire PIT) is the communications arm of the TFFT and developed many well received public information campaigns to bring awareness to living in the WUI, wildfire preparedness, and highlighting the cross-boundary work that is occurring in the Basin.

Picture 2: The Fire PIT's "Get Defensive" campaign.

As wildfires across the West grow more extreme, the Basin has seen the emergence of new, cross-sector collaboration and partnerships. Traditional fire and land management agencies now work alongside non-profits and private sector partners to pursue adaptive, forward-thinking solutions. At the same time, the funding landscape remains unpredictable. Sustaining momentum will require a creative, thoughtful approach to identifying and securing diversified funding sources to mee the TFFT's mission.

Executive Summary

The destruction caused by wildfires in the Lake Tahoe Basin increased substantially in the last decade. In 2007, the Angora Fire burned 3,100 acres and destroyed 254 homes in South Lake Tahoe, California. The 2021 Caldor Fire burned 221,835 acres, with approximately 9,985 acres in the Lake Tahoe Basin (Meyers and South Lake Tahoe areas). The fire threatened more than 33,000 homes in South Lake Tahoe and prompted the evacuation of over 50,000 Tahoe Basin residents. While numerous structures were destroyed in the Caldor Fire (over 622 homes), no primary residences were lost in Meyers and South Lake Tahoe, now referred to as the "Christmas Valley Miracle". The successful defense of South Lake Tahoe was due in large part to the forest management and fuels treatments that had been conducted over the past 18 years by the Tahoe Fire and Fuels Team partner agencies. Fire crews fighting the Caldor Fire saw a significant reduction in wildfire intensity when the fire encountered fuels reduction treatment areas.

California, Nevada, and most of the western portion of the United States have seen a significant increase in large destructive and deadly wildfires over the past two decades. The Angora and Caldor Fires demonstrate that the wildfire risk to communities in and around Lake Tahoe is significant. Without active management in the wildland-urban interface, the risk of catastrophic wildfire will continue to increase in the years ahead. Values at risk of catastrophic wildfire include:

- Communities and public safety.
- Socioeconomic considerations.
- Recreation and scenic resources.
- Water quality, watersheds, and riparian zones.
- Wildlife habitat and forest vegetation.
- Air quality.

A Multi-Jurisdictional Strategy was collaboratively developed in 2007 to reduce the risk of catastrophic fire and protect the social and ecological values in the Basin as well as comply with the White Pine County Conservation, Recreation, and Development Act of 2006. The document combined existing fuel reduction plans and provided a framework to collaboratively treat hazardous fuels in priority areas on Federal, state, local, and private lands. In 2014, the Strategy was updated to facilitate the strategic decisions that must be made by land management, fire, and regulatory agencies to reduce the probability of a catastrophic wildfire in the Lake Tahoe Basin. It established a process for identifying and prioritizing projects that will have the greatest benefit for Lake Tahoe communities. The 2014 Strategy update adopted the three goals of the National Cohesive Wildland Fire Management Strategy (2014). The goals are to:

1. Restore and maintain fire-resilient landscapes.
2. Create fire-adapted communities.
3. Provide effective and efficient wildfire response.

Additional important updates made in 2014 included:

- An updated wildland-urban interface map, to recognize the lack of a clear boundary between communities and wildland fuels.
- A formal process for collaborative planning, tracking, and reporting fuels reduction projects.

- The inclusion of previously treated areas in the prioritization process, to recognize the need for additional treatments to meet fire behavior modification objectives.
- An analysis of the consequences of reduced demand for forest materials, and processes to increase carbon sequestration and decrease greenhouse gas emissions.

In 2017, the Strategy was amended to ensure the 2014 Strategy met the intent of the original 2007 Strategy to include all lands throughout the Lake Tahoe Basin (Basin); and also to ensure that the 2014 Strategy addresses general forest analysis through collaboratively developed, landscape-scale fuels reduction and forest restoration planning efforts, encompassing the WUI as well as general forest of the Tahoe Basin. Eighteen years of collaborative interagency fuels and wildfire prevention efforts guided by the 2007 and 2014 versions of the Strategy resulted in 78,000 treatment acres accomplished, at a cost of approximately $381 million, with an annual average expenditure of about $21 million.

The 2025 Strategy will guide the next 10-years of fuels reduction and wildfire prevention efforts in the Lake Tahoe Basin. The plan has been developed collaboratively by Lake Tahoe Basin agencies, including the USDA Forest Service, the Tahoe Regional Planning Agency, and the land managers and fire services of California, Nevada, and local jurisdictions. The full commitment by partner agencies to support and implement the Strategy will provide social and ecological benefits to all jurisdictions by protecting Lake Tahoe communities and forest resources.

Local knowledge and experience gained through implementation since 2007 and inclusion of new partners has led to important changes and revisions in this Strategy. Additions include:

- Development and completion of a Lake Tahoe Regional Evacuation Plan (2024)
- An updated Lake Tahoe Basin Community Wildfire Protection Plan (2025)
- Increased focus on fuels reduction efforts adjacent to critical infrastructure such as powerlines, water infrastructure and roads used for evacuation routes.

The treatment of hazardous fuels in the wildland-urban interface is projected to cost between $199 million and $215 million, with an additional $35 million to $48 million anticipated to implement phased treatments on previously treated areas. The Strategy identifies the need to develop and maintain a stable staff and contractor pool to implement the proposed projects. The benefits of implementing this Strategy include:

- Reduced wildfire risk.
- Reduced fire behavior.
- Increased defensible space.
- Increased forest resiliency.
- Wildlife habitat protection.
- Reduced risk of scenic quality impacts.
- Reduced potential for significant air quality impacts.
- Carbon sequestration and emission reductions.

Federal, state, and local land managers and fire agencies will continue in partnership with each other and the communities they serve to implement the Strategy and monitor its effectiveness. The continued commitment to coordinate, communicate, and collaborate will result in responsive and cost-effective wildfire prevention and fuels reduction that will protect the people and values of the Lake Tahoe Basin.

Section 1: Introduction

Background

The purpose of the Multi-Jurisdictional Fuels Reduction and Wildfire Prevention Strategy (Strategy) is to increase community protection from wildfire, improve landscape scale forest resilience to wildfire, identify potential fuel reduction treatments, and facilitate communication and cooperation among those responsible for project implementation. This updated Strategy for the Lake Tahoe Basin (Basin) continues to facilitate the strategic decisions that must be made by land management, fire, and regulatory agencies over the next 10 years to reduce the probability of a catastrophic fire in the Basin. Originally developed to comply with the White Pine County Conservation, Recreation, and Development Act of 2006 (Public Law 109-432 [H.R. 6111]), the 2025 Strategy incorporates collaborative landscape scale planning efforts such as the 2019 Lake Tahoe West Restoration Strategy and 2025 Lake Tahoe Basin CWPP tiered prioritized treatment areas (TFFT 2025; Figure 17a), as a framework to identify priority project areas and a strategy to work collaboratively on accomplishing treatments in the top tier areas over a 10-year period. Since the implementation of the Strategy, 38,000 project acres have been treated, with over 78,000 acres of treatments (multiple treatments on the same area to achieve the objective) since 2007 and 85,000 defensible space inspections since 2008. These projects have been in the highest priority areas identified in the community wildfire protection plans.

Since implementation began with the initial Strategy in 2007, important changes have occurred that change how fuels reduction work is implemented in the Tahoe Basin. Changes of particular importance include:

- A new, regional sawmill was built, and even more are being considered.
- Increased compliance with defensible space regulations.
- Planning future treatments that under a changing climate maintain the efficacy of previous completed forest health and hazardous fuel reduction treatments.
- Creation of a consistent and comprehensive tracking and reporting terminology that can be used for reporting accomplishments under the Environmental Improvement Program, among other reporting databases, and could provide a basis for collaborative and efficient planning of future projects.
- Alignment of the Strategy with the 2014 National Cohesive Wildland Fire Management Strategy.

In addition, improvements in mapping technology, fire behavior modeling, and local knowledge and experience have provided a much more comprehensive and inclusive wildland-urban interface boundary that better identifies areas to be considered for priority treatment based upon the updated community wildfire protection plans and recent Lake Tahoe Basin Management Unit Forest Plan Environmental Impact Statement.

The implementation of defensible space requirements on private property represents a significant investment in fuels reduction by both private landowners and fire agencies. The Basin fire districts/departments provide defensible space inspections and curbside chipping to property owners, and enforce codes and regulations related to defensible space and building construction. CAL FIRE has assumed the “Direct Protection Area” responsibility for the State of California State Responsibility Areas lands and provides greater enforcement capacity for defensible space compliance. Washoe and Douglas counties in Nevada, and the State of California have adopted codes requiring defensible space and ignition-resistant construction within the Basin which can now be enforced.

Compliance with defensible space requirements is impeded by several factors, including cost and time

constraints and property owners' perceptions of risks and benefits as examples (Toman et al. 2013). Retrofitting structures to be less prone to ignition and wildfire can be especially costly. Existing programs have increased compliance, but there is a need for continued outreach and education, expanded implementation assistance programs, and broader enforcement actions.

Since the development of the original Strategy, the National Cohesive Wildland Fire Management Strategy (Cohesive Strategy) has been developed by the Wildland Fire Leadership Council as required by the FLAME Act. The tenets of the Cohesive Strategy have been embraced by land management agencies and those charged with fire suppression at the local, state, and national level. The Cohesive Strategy has three broad goals to address the complex challenges of preparing for fire in the wildland-urban interface:

1. **Restore and maintain fire resilient landscapes.**
   Landscapes across all jurisdictions are resilient to fire-related disturbances in accordance with management objectives.

   This goal is at the heart of the Strategy, which recognizes and addresses risks to ecosystems under a changing climate at a landscape scale, as well as risks to life and property. The Strategy allows for the prioritization of projects that will have the greatest benefit to communities and landscapes, without regard of jurisdictional boundaries.

2. **Create fire-adapted communities.**
   Human populations and infrastructure can withstand a wildfire without loss of life or property.

   This goal is closely intertwined with the creation of defensible space and the need for public education, engagement, and enforcement. The Strategy promotes the development of consistent outreach and messaging, facilitates interagency cooperation, and strengthens communication and support between agencies and the public.

3. **Provide effective and efficient wildfire response.**
   All jurisdictions participate in making and implementing safe, effective, and efficient risk-based wildfire management decisions.

   The Strategy improves wildfire response by providing strategic treatments on the landscape designed to facilitate safer and more successful suppression. The improved tracking of completed fuels treatments improves the ability to inform risk-based management decisions as well as tactical suppression actions.

Implementing the forest fuels reduction portion of the Strategy has cost $381,842,449 since 2007, with an annual average expenditure of $21,213,469 per year. The work is ongoing and Federal, state and local program managers continue to treat the remaining priority areas, and maintain the significant investments of time and money that have been invested to ensure communities are protected into the future.

When the Strategy was developed, there were market outlets that served as cost offsets, including one large sawmill and several biomass facilities within the local area. Today, there is a sawmill located in Carson City, Nevada, and plans for other forest products facilities in the region are limited, which continues to contribute to an increased need to utilize prescribed fire to dispose of treatment residue that would have otherwise gone to the biomass facilities. The use of prescribed fire in the Basin is limited by a variety of factors, such as air quality restrictions, favorable weather conditions, and available resources—leading to a backlog of unburned piles. At the same time, prescribed fire is an important management tool in the face of restrictions on use of mechanical treatment, access, and lack of markets to dispose of woody biomass. As more projects are completed, the need for prescribed burning is anticipated to increase, leading to a much larger backlog of burning needs.

The implementation schedule identified in the original 2007 Strategy called for 5,000 acres of treatments annually to meet the desired goal of completing initial fuels entry in all wildland-urban interface acres. Since 2008, the average has been 4,532 acres of treatments completed annually. With the finalization of the 2025 Basin-Wide CWPP, additional priorities areas have been identified to continue fuels reduction work in the most critical areas.

There will continue to be a need to return to previously treated areas to maintain the efficacy of these treatments. Planning for, implementation of and prioritization of these additional treatments is underway. Treatments completed to date have focused on the highest priority areas, closest to the communities. As initial entry treatments begin to age, it will be necessary for land managers to weigh the hazard risk reduction benefits to be obtained by completing the initial entry on a project that is further from a community versus reentering a treatment unit that is closer to the community. With technological advances, modeling products such as Vibrant Planet's Land Tender have helped with streamlined project prioritization and will assist with future project prioritization.

Scheduling and coordination are increasingly important, because much of the future treatments to maintain desired fire behavior characteristics can be implemented at much lower costs/acre, especially when larger acreages are treated. Cost and implementation efficiencies can be recognized by scheduling and coordinating treatments and continued maintenance over time. Treatments have ancillary benefits related to improving forest structure and resiliency and reducing the potential for other catastrophic disturbances (such as, drought impacts, insect and disease, and climate change).

Wildland-Urban Interface

The *wildland-urban interface* is defined in the Healthy Forest Restoration Act of 2003 (The Act) as "an area within or adjacent to an at-risk community that is identified in recommendations to the Secretary in a Community Wildfire Protection Plan." The Act specified that it is the local community's responsibility to define the location of the wildland-urban interface and that Federal agencies are required to use the wildland-urban interface defined in the community wildfire protection plan development process. Communities identified as "at-risk" (most of the Basin communities are identified) are identified in *Federal Register* 66(160): 43384□43435.

Fuel treatment efforts are primarily applied to reducing wildfire risk within the WUI defense zone, which includes areas within the community and generally extends for 0.25 miles beyond the edge of a community, as well as the threat zone which is an extension of the defense zone. These areas are within and immediately adjacent to communities where lives, property, and infrastructure are concentrated. Fuel treatments in these areas are designed to reduce fire behavior to allow firefighters to operate in a more safe and effective suppression environment. However, landscape-level wildfire risk analysis may identify untreated areas outside the WUI which pose a significant risk to communities. Such areas may show elevated risk to a community due to many factors including a high density of historic fire ignitions, hazardous fuel accumulation, and topographic and/or dominant wind direction alignments. Treating areas of high risk in the general forest will increase the ability to stop or slow potential future fires before they reach WUI treatments that serve as the last line of defense to communities. Strategically placed large area treatments (SPLATS) implemented at a landscape scale in the general forest are effective at interrupting fire spread and reduce spread rates and fireline intensity (Finney 2001, Schmidt et al. 2008, Collins et al. 2010, Hudak et al. 2011, Fry et al. 2015).

In addition to reducing spread rates and fireline intensity, fuel treatments outside the WUI reduce crown fire activity. Reducing crown fire activity decreases ember production that can lead to spot fires or the direct ignition of structures at great distances downwind from the fire front. Spot fire distances in the Angora fire were estimated at ¼ mile downwind (Murphy et al. 2007). Under extreme fire weather

conditions spotting distances of over ½ mile are common. Spotting ignitions ahead of the fire can break established defense lines, which can result in unpredictable fire spread (Koo et al. 2010). Additionally, embers landing on and adjacent to homes and other structures can be a direct source of ignition resulting in damage or loss. The Angora Fire Assessment (Murphy et al. 2007) states that fuel treatment units effectively reduced the fire to a surface fire and reduced the number of embers impacting houses. "Without the fuel treatment, the ember impact zone would have been several hundred yards further into the subdivisions" (Murphy et al. 2007, page 15).

In the Lake Tahoe Basin, there is generally no clear boundary between wildland fuels and developed communities. Wildland fuels exist throughout Tahoe communities with sufficient continuity that a wildland fire would readily burn through the community as though it were burning in wildland areas. Only the presence of roads and impervious surfaces mitigates fire hazard; however, in dry windy conditions, spot fires would cause a fire to travel through the area regardless of the presence of homes or roads.

This Strategy contains an updated wildland-urban interface map, which includes developed areas within the defense zone to recognize the lack of a distinct boundary between communities and wildland fuels. Improvements in mapping technology, fire behavior modeling, and local knowledge and experience have provided a much more comprehensive and inclusive wildland-urban interface that better identifies areas to be considered for priority treatment based upon adopted community wildfire protection plans and recent Lake Tahoe Basin Management Unit Forest Plan (Figure 2). In some instances, jurisdictional boundaries extend beyond the watershed boundary of the Basin.

Community Intermix, Defense and Threat Zones

The Healthy Forest Restoration Act (the Act) provided guidance to communities on the location of the interior boundary of the wildland-urban interface, but did not provide guidance for communities to determine the outer boundary of the wildland-urban interface. The Act left these decisions to the local communities so that local fire managers could account for fuel loading, topography, and local weather when planning the location of fuels reduction projects. This Strategy identifies two zones within the wildland-urban interface.

- **Community WUI Intermix / Urban Core:** Community WUI Intermix is the built environment (also defined as "Urban Core" by the US Forest Service) and is a subset of the Defense Zone. This area refers to portions of this interface where structures are closely intermingled with wildland vegetation, increasing the risk of fire spreading from the natural environment to human-built structures, and vice versa.

- **Defense Zone:** 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. All areas within the defense zone are a priority for fuels reduction; specifically fuels reduction in wildland areas and defensible space within the built areas. The intent of fuels reduction within 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 provides an adequate area for firefighters to engage the fire before it can reach the built environment. Buildings and the defensible space around them form a critical component of the defense zone.

    - **Built Environment:** All new construction and substantial remodels must comply with either building codes or the International Wildland Urban Interface Code as required by state and local regulations. Owners of existing homes are encouraged to upgrade their homes to meet the intent of the relevant regulations and are required to upgrade their homes when certain conditions are met when remodeling a home or adding a home addition.

- **Defensible Space in the Defense Zone:** Developed properties, including homes and businesses, in communities within the wildland-urban interface are required to implement and maintain rigorous standards for fuels reduction. When structures are present, fuels should be modified following the standards identified in state and local regulations. The "Fire Adapted Communities" booklet published by the Cooperative Extension at the University of Nevada is a useful guide for homeowners to better understand the defensible space options for their homes and community:
  - ***Noncombustible Area:*** This area extends from the structure out to 5 feet. In this area no combustible vegetation or ground covers are permitted. Examples of nonflammable vegetation would be well irrigated flowers or succulent plants. Compost may be used; however, flammable mulches such as pine needles, shredded bark, bark, and woodchips are prohibited.
  - ***Lean, Clean, and Green Area:*** This area extends from the noncombustible area out to 30 feet. In this area single isolated specimens of flammable plants are permitted and plants are to be kept healthy and free of dead material. Combustible mulches may not be used as a widespread ground cover and may not be used in a manner that would carry fire (that is, a fire must self-extinguish in this area).
  - ***Wildland Fuel Reduction Area:*** This area extends from the lean, clean, and green area out to the wildland. In general, it is recommended that homeowners complete at least 100 feet of defensible space, but that distance may be increased up to 300 feet depending on slope and fuel types. In the wildland fuel reduction area, there must not be horizontal and vertical fuel continuity. Isolated patches of native shrubs, trees, and some patches of flammable ground covers are allowed; however, they cannot be continuous or capable of carrying fire to or from the home. Vertical fuel continuity (ladder fuels) is a condition where surface fuels are under small- or medium-sized trees which are then directly under the larger trees that compose the forest canopy. Ladder fuels enable surface fire to travel into the forest canopy and produce flame lengths far greater than what firefighters can safely engage.
- **Threat Zone:** The threat zone is an extension of the defense zone with the important distinction that not every area within the threat zone may be a priority for treatment. Area treatments within the threat zone are designed to reduce fuels in target areas where fires are known to start, where a fire start is likely to grow and threaten communities.

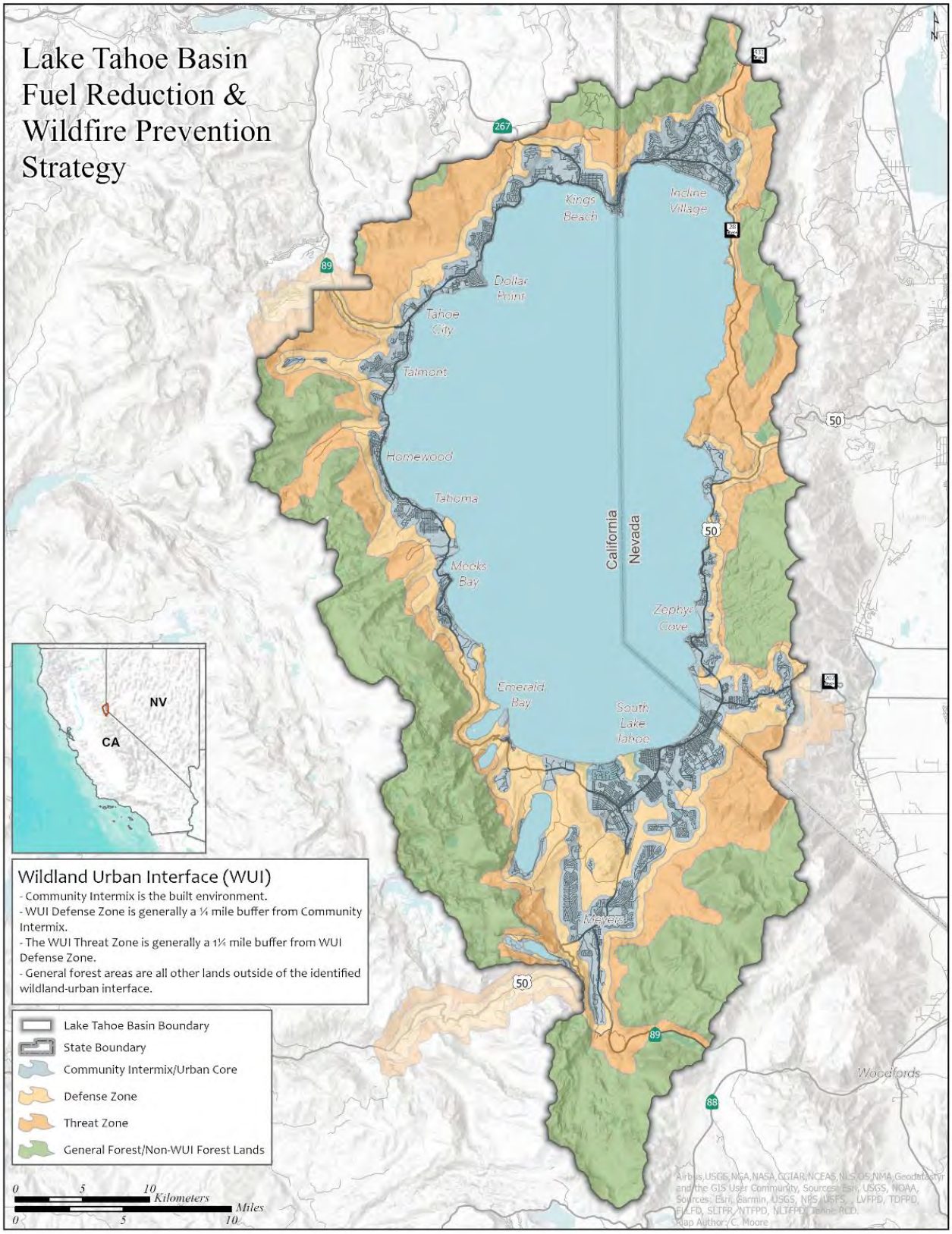


Figure 1: Wildland Urban Interface by Zone.

General Forest

General forest areas are all other lands outside of the identified wildland-urban interface that are not in wilderness. These areas are not specifically addressed in the Healthy Forest Restoration Act; however, treatments can be implemented there for fuels reduction, forest health, and ecosystem resiliency, and to address emergency needs (such as, windthrow, salvage, forest insects and disease, etc.) in addition to other management considerations.

Table 2:Wildland-Urban Interface Acres within the Tahoe Fire and Fuels Team WUI (refer to 2025 LTB CWPP).

Zones	**Acres**
Wildland-Urban Interface (Community WUI Intermix + Defense Zone + Threat Zone)	114,564
Community WUI Intermix	35,105
Defense Zone	32,739
Threat Zone	46,718
General Forest	88,783

Community Wildfire Protection Plans

The Lake Tahoe Basin released the 2025 Lake Tahoe Basin Community Wildfire Protection Plan (CWPP) update in February 2025. This is the third iteration of the Tahoe Basin CWPP with previous versions completed in 2004 and 2015. The 2025 CWPP was developed collaboratively with community input and within the context of the collaborative agreements and the guidance established by the Wildland Fire Leadership Council. The 2025 Lake Tahoe Basin CWPP was led by the Tahoe Resource Conservation District through Regional Forest and Fire Capacity Program funding provided by the California Department of Conservation (through a grant managed by the California Tahoe Conservancy). The 2025 CWPP established a CWPP Steering Committee composed of all Tahoe Basin Fire Protection Districts, federal and state land management and regulatory agencies and incorporated local community input through many outreach efforts including a Basin-wide online survey, social media, tabling at local events, and provided a 30-day comment period for the final draft document.

Community wildfire protection plans are created by local jurisdictions to meet three primary requirements as specified in the Healthy Forest Restoration Act:

(A) Collaboration: A CWPP must be collaboratively developed. Local and state officials must involve non-governmental stakeholders and federal agencies that manage land near the communities;

(B) Prioritized Fuel Reduction: identifies and prioritizes areas for hazardous fuel reduction and recommends the types and methods of treatment on Federal and non-Federal land that will protect [one] or more at-risk communities and essential infrastructure; and

(C) Treatment of Structural Ignitability: recommends measures to reduce structural ignitability throughout the at-risk community.

(D) The 2025 Lake Tahoe Basin CWPP contains four individual CWPPs, one for each quadrant of the Basin, North Lake Tahoe FPD, Tahoe Douglas FPD, North Tahoe FPD, and the South Shore division comprised of Lake Valley FPD, South Lake Tahoe Fire and Rescue, and Fallen Leaf Lake Fire Department. This plan also addresses water infrastructure for fire suppression, vulnerable communities, major evacuation route treatment areas, the importance of Fire Adapted

Communities, and is now a web-based interface using a GIS Hub/Story Map to increase the utility of the document as an educational tool for the public. For more information visit: https://tahoe-basin-cwpp-trcd.hub.arcgis.com/

Figure 2: Evacuation Corridors.

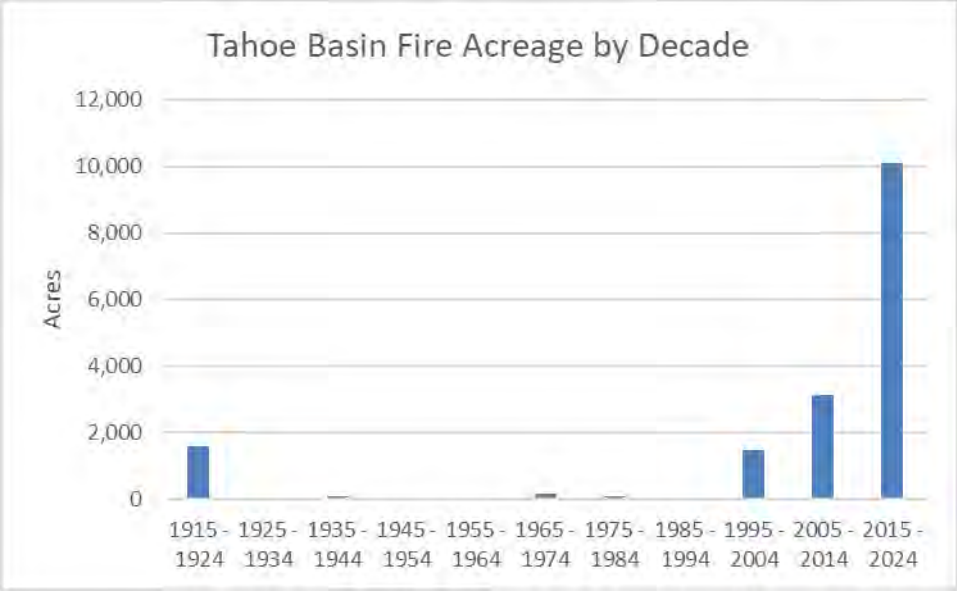
Section 2: Current Conditions and Hazards

Current Condition

The number of acres burned by wildfires in the Lake Tahoe Basin increased in each decade since 1985, including a ten-fold increase during the two last decades (Figure 3). Although the majority of fires were small, four fires grew larger than fires of the past 50 years. These were the Gondola and Showers fires in 2002, Angora Fire in 2007, and the Caldor Fire in 2021. The Angora Fire, which burned 3,100 acres and destroyed or damaged more than 254 homes, was the largest fire ever recorded in the Basin at the time. The Caldor Fire (2021) which burned approximately 9,985 acres in the Lake Tahoe Basin, has now taken the place of the Angora Fire as the largest fire ever recorded in the Basin. Weather conditions recorded at the Lake Tahoe Airport during the initial burning period of each of these fires are listed in Table 4. It should be noted that these recorded weather conditions are below the 90th percentile conditions to which the Basin land managers design fuel treatments. Even with highly effective suppression resources, the crown fire activity and sizes of these fires provide additional evidence that wildland fuel hazards in the Basin have increased substantially and will continue to increase in the years ahead (Lake Tahoe Basin Multi-Jurisdictional Fuel Reduction and Wildfire Prevention Strategy–December 2007).

The long history of fire suppression combined with incidences of drought and forest insect and pathogen-induced mortality has resulted in forest stands with a high concentration of hazardous fuels. This condition has increased the threat of large catastrophic fire and is indicative of a forest where many natural processes have been excluded.

Table 3: Wildfire acres burned in the Lake Tahoe Basin by decade (1915-2024).



Data from NIFC. (https://data-nifc.opendata.arcgis.com/datasets/nifc::interagencyfireperimeterhistory-all-years-view/abouthttps://data-nifc.opendata.arcgis.com/datasets/nifc::interagencyfireperimeterhistory-all-years-view/about).).

Table 4: Weather recorded on days when a large fire occurred in the Lake Tahoe Basin.

	Date	Maximum Temperature (°F)	Minimum Relative Humidity (%)	Average Afternoon 20-foot Wind (mph)
Gondola	3 July, 2002	77	18	9-13 with gust to 22
Showers	19 August, 2002	76	11	10-16 with gusts to 26
Angora	24 June, 2007	68	11	9-13 with gusts to 28
Tamarack	16 July 2021	84	11	5 with gusts to 23
Caldor	30 Augus 2021*	81	12	6 gusts to 18
Mosquito	7 September 2022	92	17	5 gusts to 17
90th percentile		85	5	25 (10-minute average)

Note: Data from National Weather Service; Lake Tahoe Airport. 90th percentile calculated from Meyers RAWS historical dataset May through October.

*Caldor Fire: Date fire entered Basin

Current Vegetative Conditions and Fire Regimes

Recent estimates indicate that lower elevation forests in the Lake Tahoe Basin have four times the density of trees (Figure 4), and higher elevation forests have twice the density of trees, when compared to forest conditions prior to 1870 (USDA Forest Service 2000a). High densities of trees increase competition for nutrients resulting in poor forest health. High rates of tree mortality (Figure 5) (particularly white fir [Abies concolor] but also some pine species), have increased the number of standing dead trees and downed logs. In addition to the accumulation of dead material on the forest floor, there are also smaller mid-story trees that create fuel ladders that allow fires to readily move into dense crowns. The lack of frequent, low-intensity fires has resulted in accumulations of dead fuels, increased understory shrubs, and dense young trees. As a result, flame lengths and rates of fire spread lead to higher intensity fires (Holl 2007). Residential, commercial, and infrastructure construction have also influenced today's vegetation patterns. Not only have large areas of vegetative cover been removed, but the composition of the remaining vegetation has changed through landscaping. In addition to the increased density of trees, the species composition has changed from species that are fire resistant (especially Jeffrey pine which has few branches close to the ground and thicker bark to insulate the bole), growing in open canopies with high sun exposure to species that tolerate shaded, closed-canopy environments. These species (especially white fir) are not fire resistant, having thin bark and branches close to the ground, growing in much higher densities underneath the overstory canopy.

Picture 4: Dense Forests in the Lake Tahoe Basin.

Picture 3: Forest mortality in the Lake Tahoe Basin.

Historic Fire Regime

Prior to European settlement, fires in the Basin were ignited by lightning or members of the Washoe Tribe, who inhabited the Tahoe Basin during the summer months. The fire-return interval varied from 5 to 128 years, depending on elevation (Taylor 2004), with fire-return intervals being the shortest (5 to 18 years) at the lowest elevations around the lake. Based on historic fire-return intervals, it is estimated 2,100 to 8,000 acres burned annually in the Lake Tahoe Basin, with approximately 50 percent of that at the lower elevations (USDA 2000a). Because frequent fires reduced surface and ladder fuels, fire intensities were low and there was little mortality of mature trees. These frequent fire intervals favored fire-resistant tree species, maintaining open canopies, and low tree densities, and minimized vertical and horizontal fuel continuity.

As Europeans settled in the Basin, several factors contributed to changes in the fire regime and fuel hazards. Between 1875 and 1895, large-scale clearcutting removed most of the old-growth forests in the Basin (Lindstrom et al. 2000). By 1900, 60 percent of the Basin's forests were dominated by seedlings (less than 1 inch diameter), saplings (between 1 and 6 inches diameter), and pole-sized trees (between 6 and 12 inches diameter), with a few areas of remnant old-growth forests. In conclusion, disturbance by fire which was a frequent and normal part of the historic vegetative condition has been severely altered.

Current Fire Regime

Since 1910, management direction focused on protection of natural resources by suppressing wildfires, which removed a natural source of vegetation disturbance. Modeled fire behavior in the Basin and observed fire behavior in the Caldor, Emerald, Angora, Gondola, Showers, and Pioneer fires demonstrates current fire behavior is characterized by high-intensity fires, regardless of slope or riparian vegetation. Thus, the fire regime has changed from frequent, low-intensity fires to infrequent, high- intensity fires. High-intensity wildfires will result in high tree mortality in forest stands, could result in extensive property loss, and could cause large amounts of erosion and sedimentation that would adversely affect water quality.

Fire Return Interval Departure

The *fire return interval departure* is a measure of how much the existing condition has departed from the historic conditions related to fire-return intervals (Safford et al. 2011). Figure 6 indicates that approximately 30 percent of the Basin is in a condition of severe departure, and 38% of the Basin is in a condition of a moderate departure, meaning that "Fire regimes have been substantially altered from their natural (historical) range. The risk of losing key ecosystem components is high. Fire frequencies have departed from natural frequencies by multiple return intervals. Dramatic changes occur to one or more of the following: fire size, intensity, severity, and landscape patterns. Vegetation attributes have been substantially altered from their natural (historical) range."

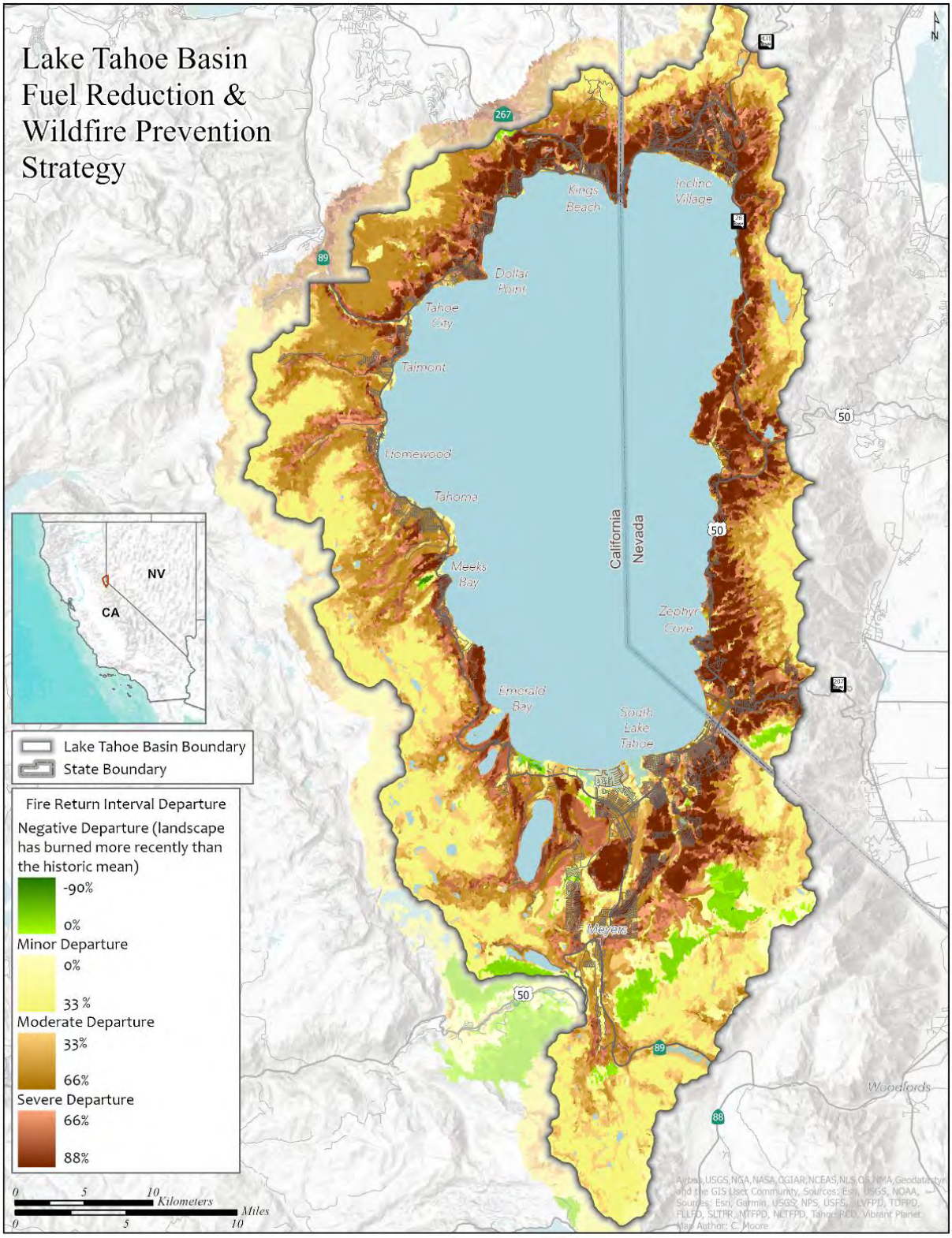


Figure 3: Mean fire return interval departure. Source: Vibrant Planet.

Current Wildfire Potential

The Lake Tahoe Basin Final Revised Land and Resource Management Plan Final Environmental Impact Statement (USDA Forest Service Lake Tahoe Basin Management Unit 2013) quantified and assessed the wildfire threats in the Tahoe Basin. For this update, ignition history and fire behavior modeling provided by Vibrant Planet were used to predict fire susceptibility in the Basin and t he Pyrologix Wildfire Exposure Simulation Tool (WildEST) was used to predict fire behavior characteristics such as flame length and fire type (Pyrologix 2024).

Ignition risk is the probability of a fire start and is determined by utilizing the frequency of historical fire starts (Figure 7). Seventy-four (74) percent of all ignitions occur in the wildland-urban interface (31% in the Community WUI Intermix/Urban Core, 23% in the defense zone, 20% in the threat zone), of which the vast majority of ignitions are human caused (68%).

Fire Type and Flame Length

Fire type can be classified into three general types: *surface fire*, *underburn or passive crown fire*, and *active crown fire* (Anderson 1982). A *surface fire* is a fire that is carried by surface fuels. An *underburn* is a fire that is carried by surface fuels where crowing is possible but unlikely. A *passive crown fire* is a type of crown fire in which the crowns of individual trees or small groups of trees burn, but solid flaming in the canopy cannot be maintained except for short periods (Scott and Reinhardt 2001). An *active crown fire* presents a solid wall of flame from the surface through the canopy fuel layers. Active crown fires can exhibit extreme fire behavior where rapid rates of spread, extreme flame lengths, spotting, convection columns, and fire whirls can make direct attack efforts by firefighters impossible. Fire type can be used as an indicator for determining the risk of large tree loss in the event of fire (Figure 8). In the Tahoe Basin approximately:

- 170 acres received an extreme fire behavior rating (active crown fire). Under these conditions, resources such as aircraft will be needed to engage these fires, with prompt suppression unlikely (Figure 8).
- 53,000 acres produced passive crown fire, which would hamper suppression efforts.
- 122,000 acres would be considered to have low-moderate fire behavior (surface fire or underburn). These fires can be directly engaged with fire personnel, engines and other direct attack methods.

Flame length is the distance between the flame tip and the midpoint of the flame depth at the base of the flame (Rothermel 1983). Higher flame lengths are more likely to facilitate movement of a surface fire to a passive crown fire or an active crown fire. Fuel composition and weather significantly influence flame length. Flame length relates to the types of resources needed for effective suppression. Flame lengths are analyzed and described in four categories (see Table 5).

The flame length data shows that fire in 68% of the forest would exceed the 4-foot flame length and result in large-scale tree mortality (Vibrant Planet 2024). Within the Tahoe Basin approximately:

- 65,000 acres would produce flame lengths less than 4 feet.
- 137,000 acres would produce flame lengths greater than 4 feet. Under fire behavior conditions with greater than 4-feet flame lengths and passive crown fire, fire crews cannot use direct attack strategies and must rely on mechanized equipment and aerial support to suppress these fires (Table 4 and Figure 5).

Table 5: Explanation of analysis categories for flame lengths.

Flame Length (feet)	Description
0–4	Fires can generally be attacked at the head of flanks by persons using hand tools.
4–8	Fires are too intense for direct attack on the head of the fire by persons using hand tools. Equipment such as dozers, pumpers, and retardant aircraft can be effective.
8–11	Fires may present serious control problems torching, crowning, and spotting. Control at the fire head will probably be ineffective.
>11	Crowning, spotting, and major fire runs are probable. Control efforts at the head of the fire are usually ineffective.

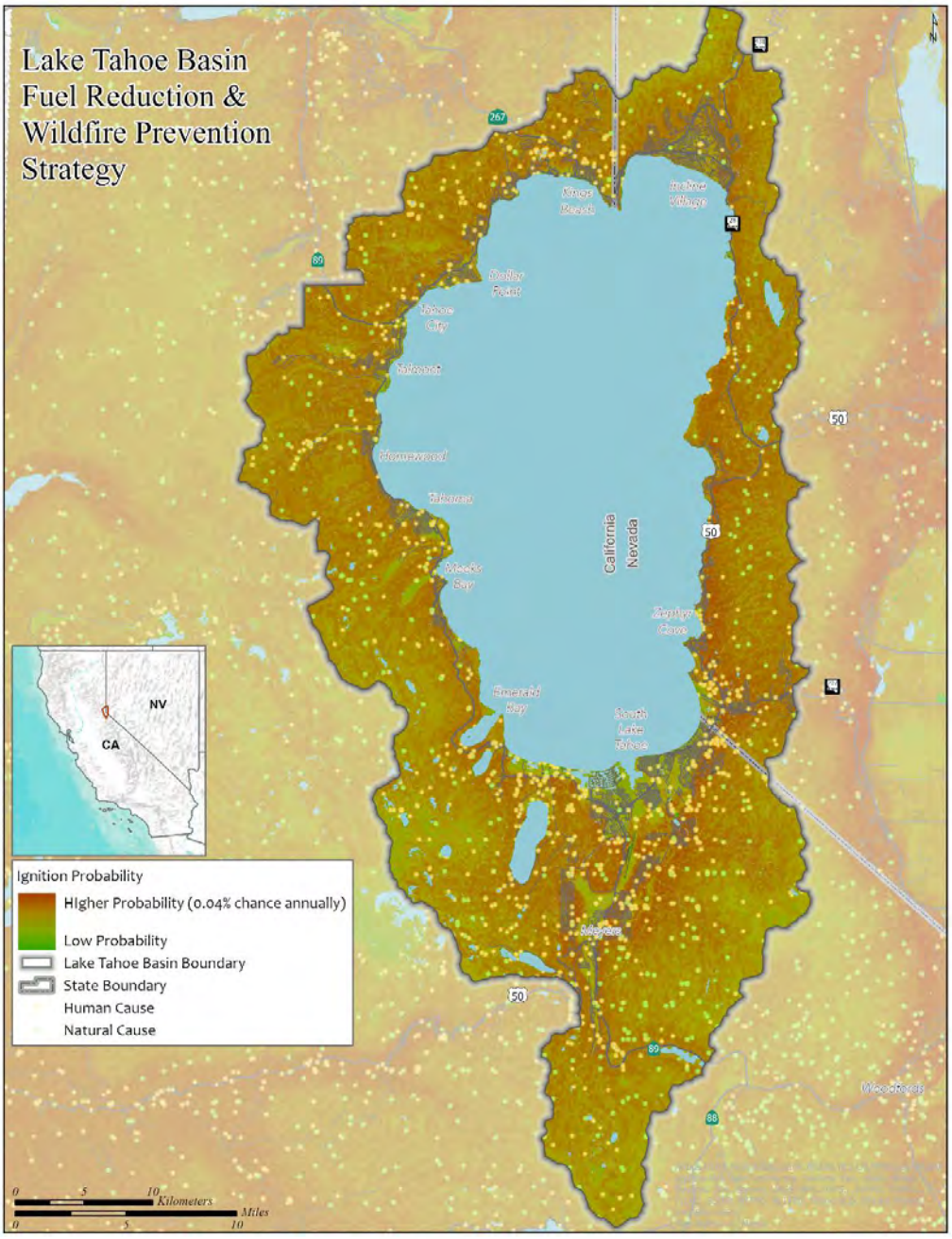


Figure 4: Ignition risk and ignition causes in the Lake Tahoe Basin. Source: Vibrant Planet and NIFC.

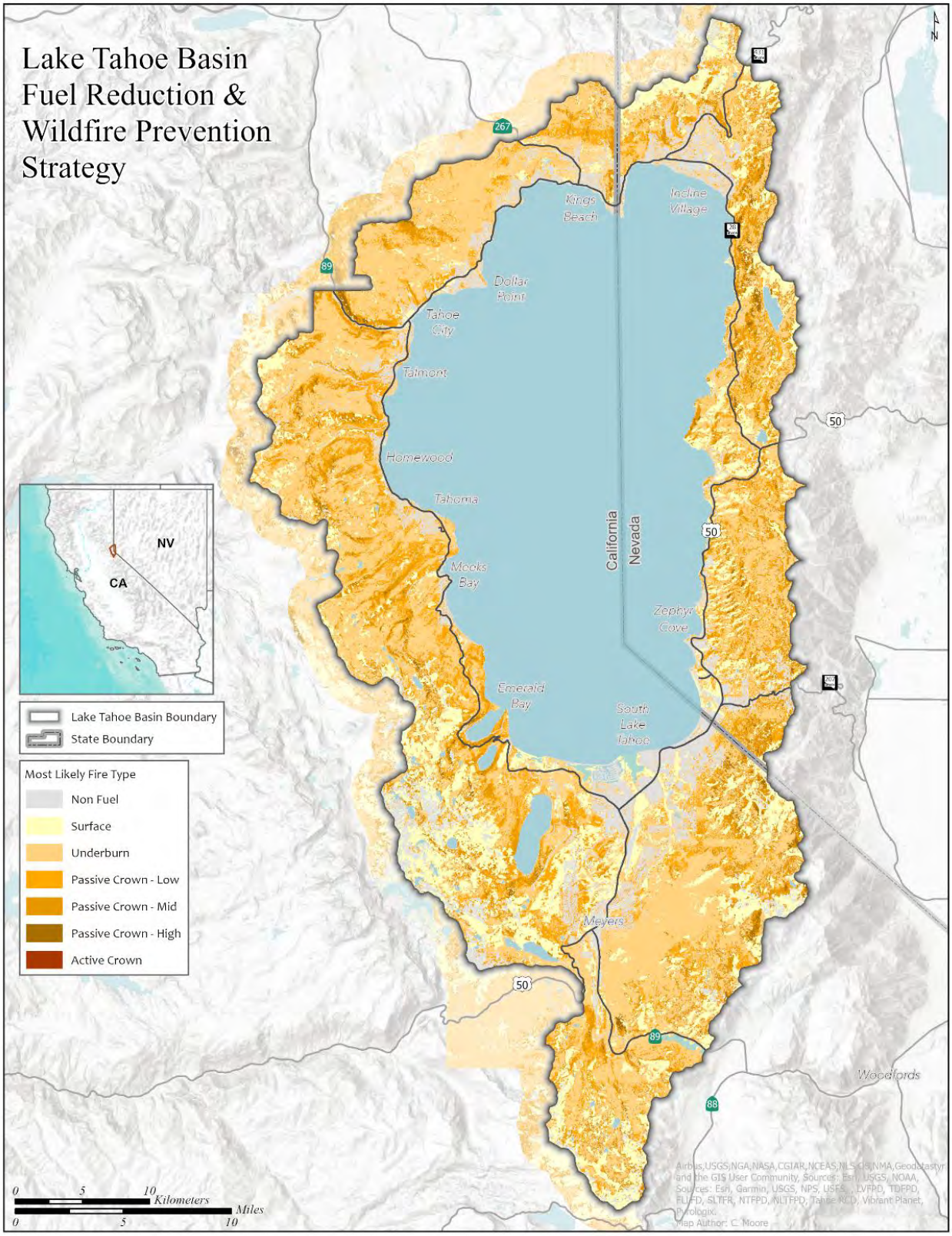


Figure 5: Predicted fire type. Source: Vibrant Planet.

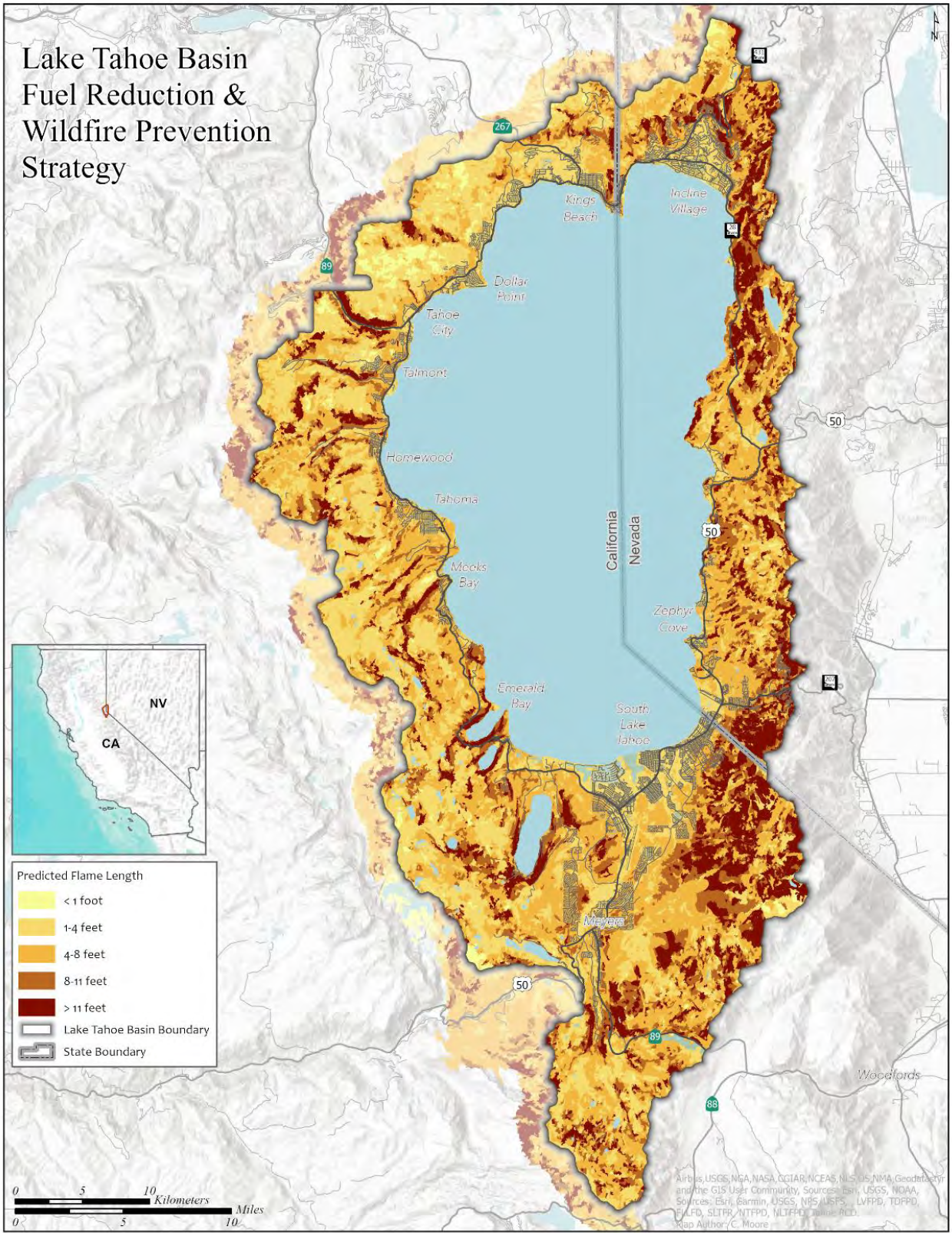


Figure 6: Predicted flame length. Source: Vibrant Planet.

Defensible Space, Home Hardening, and Fire Adapted Communities

Defensible space is a key component to community wildfire mitigation and has been messaged, encouraged and enforced in the Tahoe Basin for over 25 years (Figure 10). The Tahoe Basin Fire Safe Council FSC (2002-2006) followed by the Nevada FSC (2006-2015) were the original organizations that provided technical and financial support to communities. Since 2017, the Tahoe Network of Fire Adapted Communities (TNFAC), funded through the Southern Nevada Public Land Management Act, has been the program that supports communities in preparing for wildfire, including defensible space inspections, free curbside chipping, community workday support, green waste dumpsters, assisting communities in attaining Firewise recognition, establishing Fire Adapted Communities, and providing education materials and technical support from wildfire prevention experts. This is a highly successful program, managed by the Tahoe Resource Conservation District, and includes active support from local Fire Protection Districts, University Cooperative Extensions (California and Nevada), and local agencies. As of Spring 2025, the Tahoe Basin has almost 100 organized Fire Adapted Communities, most of which have also received Firewise recognition. The TNFAC is funded through the Southern Nevada Public Land Management Act.

There have been many lessons learned in the Lake Tahoe Basin. Though parcel-level defensible space is important, defensible space at the community scale is by far the best way to minimize community conflagrations. Defensible space (including the "0-5 foot non-combustible zone" immediately adjacent to the structure) and home hardening work together to protect homes and communities from wildfire, as demonstrated in the Christmas Valley neighborhood in South Lake Tahoe during the Caldor Fire. During the Caldor Fire, all three of the National Cohesive Wildland Fire Management Strategy tenets came together: 1. Restore Resilient Landscapes, 2. Create Fire Adapted Communities, and 3. Provide Safe and Effective Wildfire Response. The alignment of these three tenets allowed firefighters to successfully protect Lake Tahoe communities, and not a single home burned.

State, local and federal fire agencies are actively educating, inspecting, and enforcing defensible space standards. All local fire agencies in the Tahoe Basin have memorandums of understanding with the Tahoe Regional Planning Agency whereby the local fire department can inspect properties and issue tree removal permits if tree removal is deemed necessary to create adequate defensible space. Along with issuing permits, local fire agencies consult with homeowners about defensible space and provide an inspection report based on state laws requiring defensible space. As the number of homes owned by out-of-area owners increases, the challenges of implementing defensible space standards and public education regarding wildland fire hazard becomes increasingly complex.

Local fire agencies provide community assistance to homeowners, such as chipping programs where residents can have yard waste chipped and hauled from the property. In addition, the LTBMU provides homeowner and stewardship agreements to allow homeowners to extend their defensible space onto national forest lands.

Picture 6: Hand thinning to create defensible space (before).

Picture 5: Hand thinning to create defensible space (after).

Climate Change – Past and Projected Trends

The Lake Tahoe Basin Management Unit Forest Plan Final Environmental Impact Statement provides a summary of past and projected climate trends (USDA Forest Service Lake Tahoe Basin Management Unit 2013). Trends observed in the Basin in recent years include a 2°F increase in mean temperatures over the last century, and fewer nights with night-time temperatures below freezing. For the first time on record, mean annual temperature is above freezing, and since 1910, the average number of days below freezing has decreased by 27 days. Annual precipitation has been highly variable. The amount of precipitation that falls as rain is increasing, and peak snowmelt is occurring earlier. Between 2015 and 2024, there were 3 years with above average precipitation and 7 years with below average precipitation. During this timeframe, the annual rainfall average decreased by over four inches.

All climate change models project significant warming (4 to 9°F) by 2100. Most models project precipitation amounts similar to current levels, but drier summers and continued increases in rain to snow ratios. Stream flows in winter and early spring are expected to increase while decreased stream flow is expected for late spring and summer. Projections also indicate shifts in vegetation elevation ranges and decreasing conifer range, coupled with expansion of grass and shrub types.

Potential impacts include more frequent and larger fires, increased tree mortality during longer growing-season droughts, increased bark beetle risk due to drought-induced susceptibility and multiple beetle broods per season. In addition to mortality agents, increased tree recruitment and growth may occur in meadows due to increased CO_2 fertilization and drought, as well as increased growth rate of fast-growing native tree species which contributes to fuel build up and increasing need for maintenance treatments.

While most of the projected trends and potential impacts are considered likely by most experts, there is always uncertainty related to future projections, especially when applied to systems as dynamic and complex as climate-ecological interactions. Therefore, the importance of a flexible strategy cannot be overemphasized.

This Strategy addresses these issues by building adaptive capacity through ecological restoration, improving forest carbon sequestration, and increasing resilience to environmental stressors. Ecological restoration will increase ecosystem capacity to adapt to future climate conditions by increasing landscape diversity and restoring resilience to climate warming and associated stressors such as drought. The fuels reduction and restoration projects may also be designed to maintain biological diversity and develop habitat connectivity. While untreated forest may store large amounts of carbon, much of the carbon will be released compared to when a treated forest burns, or carbon released during prescribed fires. Further, untreated forests have a higher risk of burning and a lower probability of successful wildfire suppression than a treated forest.

Desired Conditions

Desired conditions are a collection of quantifiable metrics that when present indicate that the ecosystem is healthy and functioning. With respect to fire, desired conditions will indicate that the current fire regime condition class is similar to their historic norms and expected low intensity fire behavior allows safe and effective fire suppression. Generally, this means reducing vegetation in proposed project areas toward historic levels (low [I] condition class) resulting in fire behavior characteristics associated with surface fires (Table 6).

Table 6: Desired wildland fuel conditions.

	Current Trend	**Desired Trend**
Fire Regime Condition Class	Moderate (II) to high (III)	Moderate (II) to low (I)
Fire Behavior	Passive to active crown fires with flame lengths that exceed 4 feet	Surface fires with flame lengths less than 4 feet

Desired conditions for this Strategy are derived from the Lake Tahoe Basin Management Unit (LTBMU) Forest Plan and the community wildfire protection plans adopted by Basin partners. Fuel treatments on all Federal lands will be consistent with the standards and guidelines identified in the LTBMU Forest Plan. On all other land ownerships, fuel treatments will be consistent with the regulations, standards, and guidelines of the appropriate fire districts or departments and the Tahoe Regional Planning Agency. In the wildland-urban interface, defensible space on developed lots will be established and maintained consistent with applicable state or local ordinances.

Section 3: Values at Risk

Values at risk are not only monetary, but include intrinsic, non-monetary values as well. These might include the beauty of the surrounding environment, diversity of vegetation and associated habitat, clean water and air, as well as recreational opportunities and cultural resources. Consider referencing site https://wildfirerisk.org/explore.

Communities and Safety

Within the Lake Tahoe Basin, 117,954 acres (56 percent) are within the wildland-urban interface. Communities at risk identified in the *Federal Register* (August 2001) include Incline Village, Crystal Bay, Sand Harbor, Glenbrook, Kingsbury, Highway 50 Corridor, South Lake Tahoe, City of South Lake Tahoe, Homewood, Tahoe Pines, Sunnyside, Tahoe City, Dollar Point, Carnelian Bay, Tahoe Vista, and Kings Beach. However, all communities within the Basin are exposed to substantial wildland fire risks, even if not identified in the *Federal Register*.

Human health is also at risk. Exposure to air pollutants from wildfire smoke is associated with numerous effects on human health, including increased respiratory symptoms or decreased lung function, hospitalization for heart or lung diseases, or premature death. In addition, public safety and firefighter safety is at risk when wildfires continue to burn with high intensity and uncharacteristic fire behavior.

Socioeconomic Considerations

The Lake Tahoe Basin economy is driven largely by recreation and tourism. The year-round resident population of Lake Tahoe is estimated to be around 55,000. However, the total population can reach 300,000 on peak days due to tourism and visitors. South Lake Tahoe, the largest city in the area, has a permanent resident population of over 21,000 (Tahoe Fund/UC Davis, Tahoe Environmental Research Center).

Additionally, a growing number of residents in the adjacent counties of Carson City, Douglas, El Dorado, Placer and Washoe, regularly visit the Tahoe Basin along with regional visitors from the Bay Area, Sacramento Valley and Reno. These visitors dramatically influence Tahoe's environment and economy (LTBMU Forest Plan).

Daily car visitors, skiers, business meetings, seminars, organized summer camp activities, camping, hiking and backpacking, mountain biking, fishing, summer water sports and big-name concerts and high-

profile events such as the American Century Celebrity Golf Tournament, bring an estimated 15 million tourists from all over the world to the area each year. And, like other mountain town resort areas, winter sports are a significant driver of the regional economy. Overall, the Lake Tahoe Destination Stewardship Council estimates that in 2022, over 2 million visitors spent almost 15 million days in the region, generating more than $6.2 billion in direct spending (Lake Tahoe Destination Stewardship Plan).

The greatest concern with large fires in the Tahoe Basin is risk to life, property, infrastructure and natural resource values. Even a small wildfire in the Tahoe Basin is potentially significant because of the alignment of high ignition potential, high density and value of human developments, and high fuel hazard. High-intensity wildfires could result in extensive property damage or loss.

Recreation and Scenic Resources

Lake Tahoe is a treasured landscape both nationally and internationally for its dramatic beauty and ecological uniqueness. Wildfire has the potential to drastically affect the large-scale landscape character and scenic integrity. Recreational opportunities in the Tahoe Basin include California and Nevada state parks, three national forests, the Eldorado, Humboldt-Toiyabe and Tahoe, and one management unit, the Lake Tahoe Basin Management Unit.

Activities center around Lake Tahoe and recreation-related tourism shape the social, economic, and ecological conditions, and influence policies in the region. Winter and water related recreation and resorts are a primary attraction for recreationists and drive local tourism and jobs. The share of economic activity attributable to visitor-related businesses has increased significantly in 2021, from 40% to 62% (Sierra Sun).

Water Quality, Watersheds, and Riparian Zones

The clarity of Lake Tahoe is world renowned, and the loss of that clarity is of concern to many. After steadily declining for 30 years, the lake's clarity hit an all-time low in 1997. In 2013, researchers at the University of California-Davis reported that monitoring data indicates the clarity level trend had stabilized for the preceding decade (Schladow 2013). High-intensity wildfires could cause large amounts of erosion and sedimentation that would adversely affect water quality (Holl 2007). Allowing hazardous fuels to build up in stream environment zones could have significant effects on water quality in the Lake Tahoe Basin. The loss of vegetation from wildfire would result in erosion and sedimentation, decreasing water quality (Holl 2007).

Fires can have extraordinary effects on watershed processes and can significantly influence aquatic organisms and the quality of aquatic habitats in many ways (Benda et al. 2003; Rieman et al. 2003; Wondzell and King 2003). Substantial reductions in riparian shading and altered stream flows can increase stream temperatures to extreme levels (Rieman et al. 2003; McMahon and DeCalista 1990). Flooding, surface erosion, and mass wasting (landslides) may increase due to vegetation loss and the creation of hydrophobic (water-repellant) soils.

Wildlife Habitat and Forest Vegetation

Wildfire has the potential to damage or destroy suitable habitat for wildlife. Of particular concern are critical threatened, endangered, proposed and other special status species, such as the Sierra Nevada Yellow legged frog, California spotted owl, northern goshawk, bald eagle, and osprey.

In regards to important and critical wildlife habitat, high-intensity wildfires will directly result in high tree mortality in forest stands, especially within moderate- and high-density forests having

increased horizontal and vertical fuel continuity. Tree mortality (representing severity of fire effects on vegetation) would probably be high in areas that have not been treated to reduce fuels (areas where the vegetation is overly dense and multi-storied).

Native flora is also at risk as noxious weeds and invasive species tend to spread rapidly following wildfires. Wildfire areas are especially vulnerable to weed infestation because: (1) equipment used in wildfire suppression and burned area emergency rehabilitation may bring weed seeds into an area; and (2) burned areas provide ideal conditions for weed germination. Weed populations can easily gain a foothold before native vegetation has a chance to recover from the fire.

Air Quality

Many factors contribute to Lake Tahoe Basin's air pollution, including pollution from urban areas, dust from roads, automobile emissions, and smoke from wood burning stoves. Wildfires also emit large amounts of particulate matter (PM_{10} and $PM_{2.5}$) and carbon monoxide, as well as nitrogen oxides (NO_x) and volatile organic compounds (VOCs), which are precursors to ozone. Historically, almost all wildfires have exceeded the national and state standards for particulate matter, primarily due to the high outputs of these pollutants over a short period of time. Other constituents of smoke (gases and chemicals) may also enter the lungs. Some components, such as benzo-apyrene and aldehydes, can be carcinogenic.

Wildfires typically result in twice the emissions per acre when compared to prescribed fire (Huff et al. 1995), and pollution commonly exceeds ambient air quality standards during large fires. Large fires also often occur under conditions of high temperature and low humidity, when high concentrations of ozone are most likely. Although there is currently no quantitative way to fully display the emissions from wildfire as compared to a prescribed burn, the intent of fuels reduction activities is to reduce the size of, and hence the emissions, from wildfire.

Section 4: Benefits

Benefits of fuels reduction include the reduced wildfire risk, increased protection of communities, property, infrastructure and natural resource values, and an increased ability for direct suppression. Additional benefits include the increased resilience of treated areas to withstand disturbance and adapt to climate change, increased carbon sequestration, and decreased potential for adverse air quality events.

Wildfire Risk Reduction

The most significant direct benefit of fuels treatment activities is the reduction in wildfire risk. Most treatments to date and those currently planned occur within the wildland-urban interface, primarily within the defense zone. As indicated in Figure 6, wildland-urban interface areas have the most significant departure from the historic conditions of frequent, low-severity fires that resulted in more open forests with scattered larger trees, and little understory vegetation. Treatments have moved these areas towards more "fire-adapted" conditions, reducing the potential for a surface fire to move into the crowns (Figure 11).

Picture 7: Hazardous fuels reduction to reduce the risk of extreme fire behavior (before).

Picture 8: Hazardous fuels reduction to reduce the risk of extreme fire behavior (after).

Reduced Fire Behavior

Flame lengths in treated areas are expected to be reduced to 4 feet or less and canopy fire, torching and, crowning will be reduced and/or eliminated. Reducing flame lengths and reducing the risk of extreme fire behavior allows for direct attack by firefighters, and reducing canopy fire potential can decrease the amount of embers falling into neighborhoods. Direct attack suppression efforts can be rapid and effective in minimizing fire spread and fire impacts.

Increased Defensible Space and WUI Treatments

The reduction of fuels in the wildland urban interface (WUI), the area immediately adjacent to neighborhoods and communities, extends the defensible space around individual homes and structures into the wildland, contributing to the protection of these communities. It also increases firefighter safety and allows firefighters to directly attack wildfire in these areas where the fire is less severe.

Increased Forest Resiliency

The reduction of fuel loading and understory (brush and small trees), and decreases in stand density, increases the resiliency of the forest stand by reducing competition for site resources (light, nutrients, and especially water) while improving the vigor of the remaining trees (Figure 12). These treatments also help to change forest species composition by removing many of the shade-tolerant species that are more fire-prone, transitioning the overall stand species composition back towards more fire-resistant species (white fir to Jeffrey pine as an example). Reducing the tree density also allows for increased structural integrity as the residual stand increases wind firmness and ability to resist insect and disease. Opening the canopy through density reduction also increases the opportunity for the shade-intolerant, fire-adapted species to regenerate and further improve species composition. As more areas are treated, and given changes in climate, the overall landscape increases in resiliency to withstand natural or human disturbances. These treatments also facilitate the use of prescribed fire, which further reduces fine fuels and returns a critical ecological function back into fire-dependent ecosystems.

Picture 9: Mechanical thinning to reduce understory and fuel loading (before).

Picture 10: Mechanical thinning to reduce understory fuel loading (after).

Wildlife Habitat Protection

Fuel reduction treatments represent a change in habitats and provide benefits to a wide variety of species. Changes that result from fuel treatments affect species differently within a range of habitats from early seral to mature forests. Wildfire also changes habitat, and recent wildfires have created large patches of high severity burn areas. Utilizing prescribed fire can contribute to specific habitat needs that more closely emulates historic patch size and variation. In general, this Strategy aims to reduce the risk of stand-replacing fire in critical habitat areas and satisfy wildlife habitat needs to the extent possible while meeting fuel reduction objectives as identified in project-specific planning.

Reduced Risk of Scenic Quality Impacts

The forests surrounding Lake Tahoe blanket mountain slopes visible from both the lake and from the ground, whether from a road or trail. Though the forests have been altered and their conditions are not entirely healthy, they generally appear green and visually pleasing. Increasing the integrity of the forest to withstand drought, insect outbreak, forest pathogens and wildfire will help to achieve a high level of scenic stability.

Reduced Risk of Significant Air Quality Impacts

Reducing the potential for catastrophic wildfire also reduces the potential for air quality impacts from smoke and particulates generated by wildfire. Although the treatments completed and proposed do not completely eliminate smoke production, the judicious use of prescribed fire when atmospheric conditions are appropriate (following state smoke management requirements) substantially reduces the amount of smoke and particulates created. Research indicates that prescribed fire typically generates half the amount of smoke and particulates as a wildfire in the same location, due to the ability to control ignition, time of burn, and burn duration with a prescribed fire as opposed to a wildfire (Huff et al. 2005).

Carbon Sequestration and Emission Reductions

Forests cycle carbon throughout the lifespan of the forest, creating carbon emissions or becoming carbon sinks. When forest mortality increases, emissions from decomposition reduce the carbon sink effect. To the extent the fuels reduction treatments reduce future wildfire intensity, potential carbon emissions from these disturbance events would be equally reduced. Although some management actions may weaken a

forest's carbon sink effect temporarily (through significant density reduction), active management may best serve stakeholders by providing the multiple uses associated with resilient forests, including carbon sequestration benefits provided by increased growth rates in post- treatment residual stands and rapid regeneration (Reinhardt and Holsinger 2010).

Without a substantial reduction in fossil fuel emissions, the impacts of projected climate change on disturbance regimes and species composition will likely overwhelm the short-term effects of land management actions. From this perspective, the primary forest management action to mitigate increasing atmospheric carbon dioxide concentrations is the sustainable use of woody biomass to generate energy and biofuels and displace the use of more fossil-fuel intensive construction materials (Nabuurs et al. 2007). As the Intergovernmental Panel on Climate Change concluded, "In the long term, a sustainable forest management strategy aimed at maintaining or increasing forest carbon stocks, while producing an annual sustained yield of timber, fiber, or energy from the forest will generate the largest sustained mitigation benefit" (Nabuurs et al. 2007).

As in other areas of the West, Tahoe's forests act as both a source of greenhouse gas (GHG) emissions and a carbon sink that removes CO_2 from the atmosphere. The Strategy is intended, in part, to significantly reduce the GHG emissions from wildfire, pests and disease, and to significantly increase the carbon stored in the Basin's forests.

Carbon Storage Benefits from Healthy Tahoe Forests

Carbon storage benefits from continued implementation of the Strategy are likely to be small in the early years, but increase over time and generate significant long-term benefits based on the increased growth of forest stands and their improved resistance to fire, insect infestations, and climate change. The increased long-term carbon storage capacity of the Basin's forests, together with expected reductions in wildfire risk, can generate significant GHG benefits.

The projected long-term carbon storage benefits of the Strategy could be compared with the baseline values of the carbon stocks associated with Tahoe's forested lands generated as part of the GHG emissions inventory prepared for the Tahoe Conservancy in 2012 (California Tahoe Conservancy 2012). The Tahoe GHG Inventory estimates were produced for the base years of 2005 and 2010, and for 2020 and 2035 to ensure consistency with California's AB 32 and SB 375 mandates to reduce greenhouse gas emissions (see Table 7). These baseline estimates are based upon the Carbon Online Estimator v2 database, which is maintained by the USDA Forest Service's Forest Inventory and Analysis program as a record of the health of forests in the United States.

Table 7: Ten-year average tree carbon and CO_2 for the Lake Tahoe Basin (in metric tons).

Region	Tree Carbon	CO2
Carson	32,777	123,242
Douglas	117,240	440,822
Washoe	2,422	9,107
El Dorado (unincorporated)	392,749	1,476,736
Placer	138,246	519,805
Basin Total	683,434	2,569,712

The projected carbon storage benefits of the Strategy can also be calculated using the U.S. Forest Service's Forest Vegetation Simulator, which compares the growth of treated and untreated forest stands

until 2050 and simulates a moderate fire event during this period. Using a conservative estimate of up to 2,500 acres treated annually, these results are shown in Table 8.

GHG Emission Reductions from Biomass Removal

The projected GHG emission reduction benefits from removing and transporting forest material can be generated based on the results from an on-the-ground demonstration project sponsored by the Sierra Nevada Conservancy, Placer County, and the Placer County Air Pollution Control District. The project compared GHG emissions associated with the collection, processing, and transport of woody biomass to a biomass/energy facility and with the air emissions from the biomass/energy facility to the common alternative of open pile burning.

The woody biomass material generated as a by-product from forest health projects, typically measured in green tons (GT) per acre, varies depending upon the treatment method and location. Assuming the proposed projects would generate an average of 26 GT per acre with about 30 percent water content, about 13 bone-dry-tons would be generated per acre. The research showed that 0.38 metric tons of carbon dioxide equivalent (MT CO_{2e}) per bone-dry-ton of woody biomass wastes would be diverted from pile burning and used for energy, providing a GHG emission reduction of nearly 5 tons per acre treated.

In addition to reducing CO_2 emissions, biomass removal also reduces methane and black carbon emissions from pile burning, which are both potent sources of greenhouse gases. Finally, the forest biomass can displace fossil fuels in providing energy to help meet the state's renewable energy mandates. When compared to less efficient, single-cycle natural gas facilities or coal generation, the GHG emission reductions are reported to be as high as 0.90 metric tons CO_{2e} per BDT, yielding an additional 11 tons of GHG emission reductions per acre.

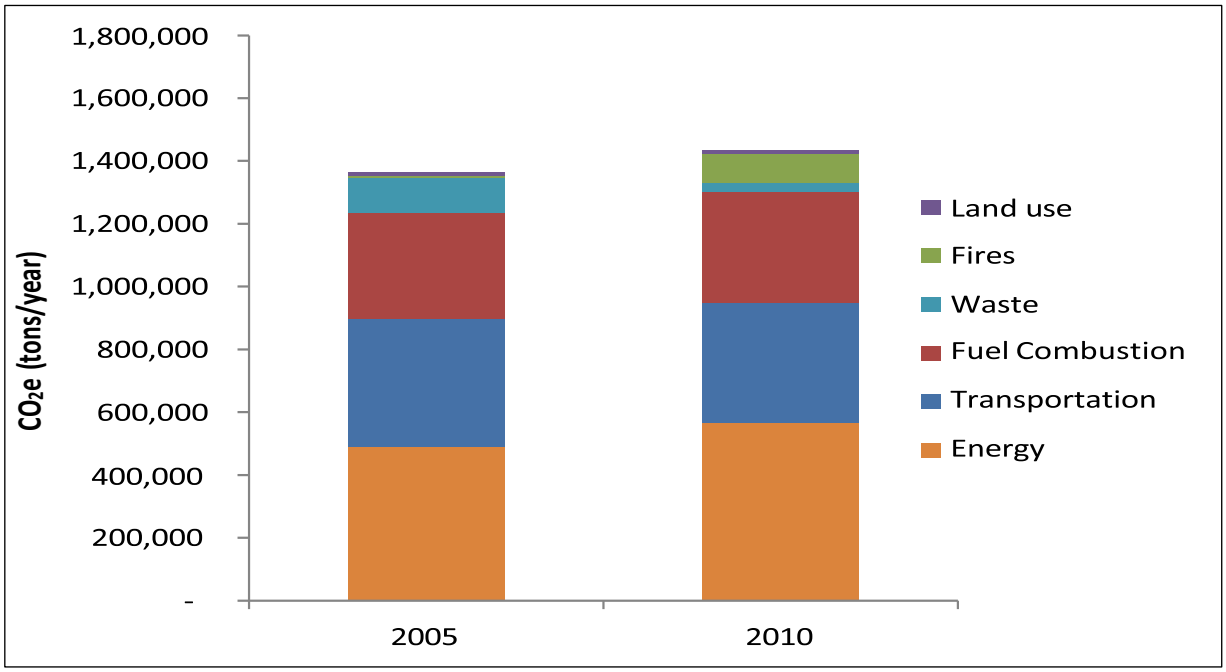
As shown in Table 8, GHG emissions under the Strategy will be reduced by at least 40,000 metric tons of CO_{2e} annually and grow over time. This annual total is based on the combination of the annual GHG reduction benefits from treating at least 2,500 acres of high priority fuel treatments and the annual expected benefit from removing the biomass waste from these projects to a biomass energy facility near the basin. By the year 2020, the projection exceeds 239,000 metric tons of GHG emission reduced, and by 2024 up to 398,500 metric tons of GHG emission reduced. Overall, the program will result in reducing fuels on over 25,000 acres within high priority fuel treatment areas identified in the Strategy, and by 2050, will reduce more than 1.4 million metric tons of greenhouse gases. These estimates do not include the additional GHG reductions expected from reductions in wildfires, which have been increasing in number and severity over the last decade, that are likely to occur with a significant increase in forest thinning projects.

Table 8: Estimated GHG carbon storage and emission reduction benefits in metric tons of carbon dioxide equivalent (MT CO_2).

Projected Annual Acres Treated	Annual GHG Benefits from Treatments	Annual GHG Benefits from Biomass Removal to Bioenergy	2020 Cumulative GHG Benefits	2050 Cumulative GHG Benefits
2,500	12,350 MT CO_{2e}	27,500 MT CO_{2e}	239,000 MT CO_{2e}	1,434,600 MT CO_{2e}

These estimates can also be compared with the baseline estimates developed as part of the Tahoe GHG Inventory. As shown below, the increased level of wildfires from 2005 to 2010 increased GHG emissions from the forestry sector (inside and outside of the Basin) from insignificant levels in 2005 to 6 percent of total basin-wide GHG emissions in 2010. As the update to the Strategy is implemented, the participating agencies could use these baseline estimates to evaluate the benefits of the projects as they are completed.

Table 9: Baseline Lake Tahoe Basin-wide CO_2 emissions by source sector.



Section 5: Fuel Reduction Projects

All existing planning efforts were reviewed and additionally proposed wildland fuel reduction treatments were synthesized into this Strategy. A primary emphasis of this Strategy is to consolidate all accomplished and proposed treatments into one database to support future scheduling and prioritization efforts. Coordination between agencies to prioritize and implement projects in the community wildfire protection plans is critical to the overall success of this comprehensive Strategy. The local fire protection districts and fire departments may periodically update their community wildfire protection plans for their respective jurisdictions, with changes in project locations or priorities as a result of these updates incorporated into the Strategy by reference.

All projects are designed to change vegetation conditions to modify fire behavior and reduce the potential for wildfire by altering three primary fuel conditions as necessary: surface fuels, ladder fuels, and overstory crown densities. This is accomplished through the implementation of a variety of treatments, commonly using more than one treatment type on the same piece of ground to achieve the desired condition. Appendix B describes the different treatments commonly used to implement these fuel reduction projects.

It is important to note that the vegetation conditions that pose a fuels hazard are dynamic, with continued growth, needle-cast, litter-fall, and new growth of understory vegetation continually occurring. As such, future treatments will need to occur over time on the same area to sustain the benefits of the previous treatments.

Building on the 2014 Strategy, working collaboratively at the landscape scale to reduce fuels and restore forests will allow fire districts and land management agencies to achieve the following goals:

1. Reduce the risk posed to communities by large and damaging wildfires in the general forest.

2. Restore the range of social and ecological values inherent in the general forest, including resilience to fire disturbances.
3. Regularly anticipate and plan for multiple treatment years into the future, including beyond the time when initial entry into today's priority WUI fuels treatments are implemented.
4. Better integrate the planning and implementation of work across the WUI and the general forest and thus allocate staff and resources more efficiently.
5. Obtain greater certainty about future workloads, and thus consistently maintain the appropriate level of staff capacity necessary to complete and maintain fuel and restoration treatments.
6. Provide greater certainty to contractors about future workloads and thus build the supply chains and infrastructure necessary to achieve economies of scale.
7. Increase community understanding and acceptance of how both the WUI and the general forest contribute to fire safety in fire-resilient landscapes.
8. Strengthen the relationships between communities, departments, and agencies necessary to respond to crises and adapt to basin-wide changes with minimal disruption.

Accomplishments

See below for fuels reduction acres treated between 1988 and 2024 in the Lake Tahoe Basin (Table 10). Significant work has been accomplished within communities treating small urban lots and undeveloped areas adjacent to private lands. These urban lots, many less than 1-acre in size, are challenging and expensive to treat, but are some of the highest priorities for treatment due to their location and proximity to residences. Table 10 displays the total acres treated to meet desired fire behavior conditions and fuels characteristics. Table 11 and Table 12 display the total acres of treatment types that were used to achieve the desired condition. For many areas, more than one treatment type was required to achieve the final desired result.

Table 10: Fuel Reduction acres (footprint acres) completed 1988-2024).

Years	CA State Parks	CTC	Federal	Local	NDSL	NV State Parks	Private	State of California	State of Nevada	Total	Average per Year
2015-2024	750	1,482	12,656	1,684	165	827	1,228	54	51	18,898	1,890
2005-2014	1,220	1,867	20,108	1,582	197	1,584	1,838	30	40	28,466	2,847
1995-2004	645	29	19,044	342	143	145	75	8	25	20,455	2,045
1988-1994	-	6	9,198	10	41	-	18	3	11	9,288	1,327

Table 11: Treatment acres accomplished (2015-2024).

Treatment Types	California Department of Parks and Recreation	California Tahoe Conservancy	Local public lands (fire districts, counties, GIDs, PUDs, etc.)	Nevada Division of State Lands	Nevada State Parks	Private	U.S. Forest Service	Total
Biomass Removal	61	196	--	8	6	--	3,048	3,318
Chipping	124	298	6	--	115	171	7	720
Hand Thinning	658	1,298	1,011	313	816	1,067	7,600	12,763
Helicopter Yarding	--	--	--	--	300	--	--	300
Mastication	--	--	142	--	1	30	359	532
Mechanical Thinning	60	247	428	248	--	0	7,228	8,211
Prescribed Burning	317	505	648	270	638	826	8,855	12,059
Pruning	--	--	--	--	1	--	5	6
Total	**1,219**	**2,544**	**2,234**	**839**	**1,877**	**2,094**	**27,102**	**37,909**

Table 12: Treatment acres accomplished (2008-2014).

Treatment Types	California Department of Parks and Recreation	California Tahoe Conservancy	Local public lands (fire districts, counties, GIDs, PUDs, etc.)	Nevada Division of State Lands	Nevada State Parks	Private	U.S. Forest Service	Total
Biomass Removal	0	--	--	--	--	--	--	0
Chipping	--	100	--	--	--	--	--	100
Hand Thinning	23	827	4,134	243	1,551	--	9,144	15,922
Mastication	--	302	30	--	--	--	--	332
Mechanical Thinning	--	4	75	--	105	5	3,497	3,687
Prescribed Burning	14	63	171	545	1,753	--	17,775	20,320
Total	**37**	**1,296**	**4,410**	**788**	**3,409**	**5**	**30,416**	**40,361**

Current and Future Projects

There are numerous projects currently in planning or in the implementation phase that have not yet been reported as accomplished. Figures 14-17 show the forest fuels treatment accomplishments and Figure 17a shows the prioritized treatment areas as defined in the 2025 CWPP. The definitions below further explain these categories**.** *It is important to note that Figure 17a identifies large areas to be considered for treatment. Not every acre needs treatment to meet desired fuel conditions; therefore, actual acres treated will be less.* The forest fuels treatment accomplishments projects on the following maps are those that were planned and fully implemented by the end of 2024. These projects will be considered for treatment again as vegetation/fuels conditions warrant. Fire behavior in treated areas is expected to be surface fire types, with flame lengths less than 4 feet. These characteristics allow for direct suppression actions, increasing firefighter and public safety.

Prioritized treatment areas were developed for the 2025 Tahoe Basin CWPP. Prioritized treatment areas are ranked using a tiered system, with Tier 1 representing the highest priority for fuels reduction. As the tier numbers increase (e.g., up to Tier 5 or 10), the urgency for treatment decreases accordingly. All priority treatment areas encompass federal, state, local, and private lands, promoting cross-boundary and shared stewardship opportunities for increasing pace and scale of fuels reduction treatments.

It is important to note that each tier ranks the priority of treatment areas, but not every acre within a treatment area will require treatment. Thus, it is not necessary to treat all Tier 1 areas before implementing projects in Tier 2, and in some cases, it may be more important to treat an area in Tier 2 with a higher restorative return on investment over a project in Tier 1. Additionally, due to the region's geography and vegetation, areas will need retreatment for effective maintenance – so it may be necessary to retreat areas in Tier 1 before moving onto areas in Tier 2. However, these types of considerations will be addressed with the annual TFFT Incident Action Plan that identifies the projects being implemented in the coming year.

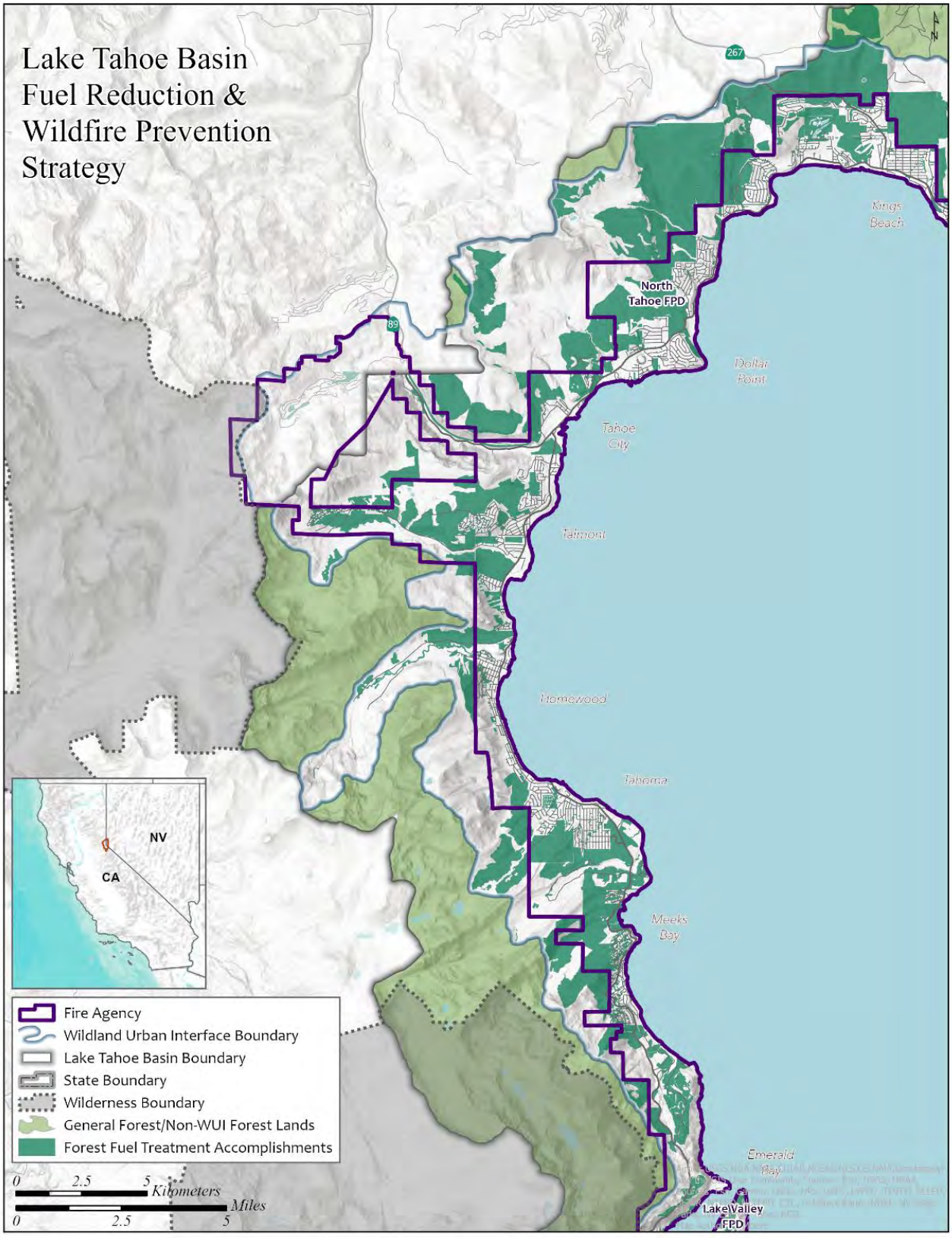


Figure 7: Forest fuel treatment accomplishments - North Tahoe.

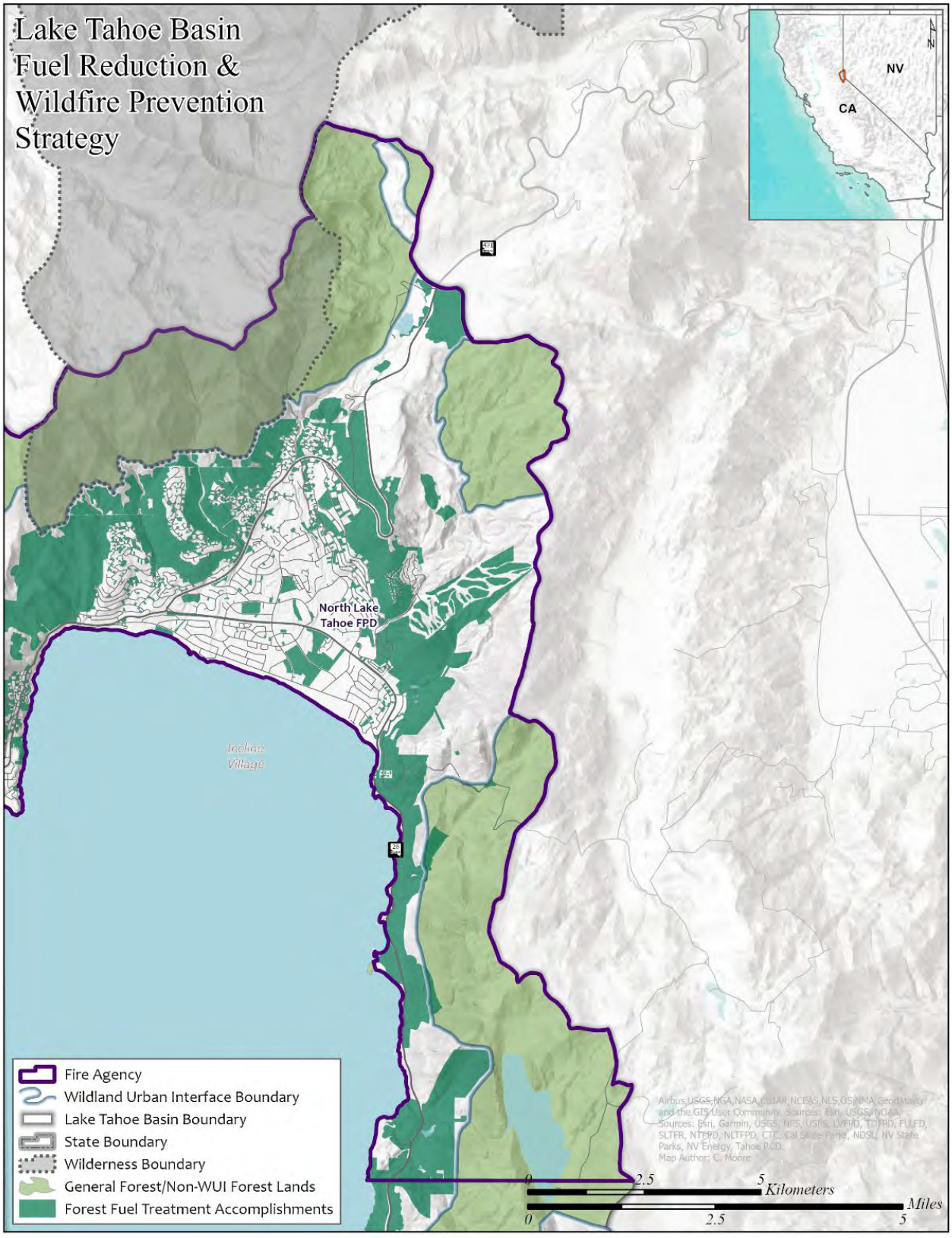


Figure 8: Forest fuel treatment accomplishments - North Lake Tahoe.

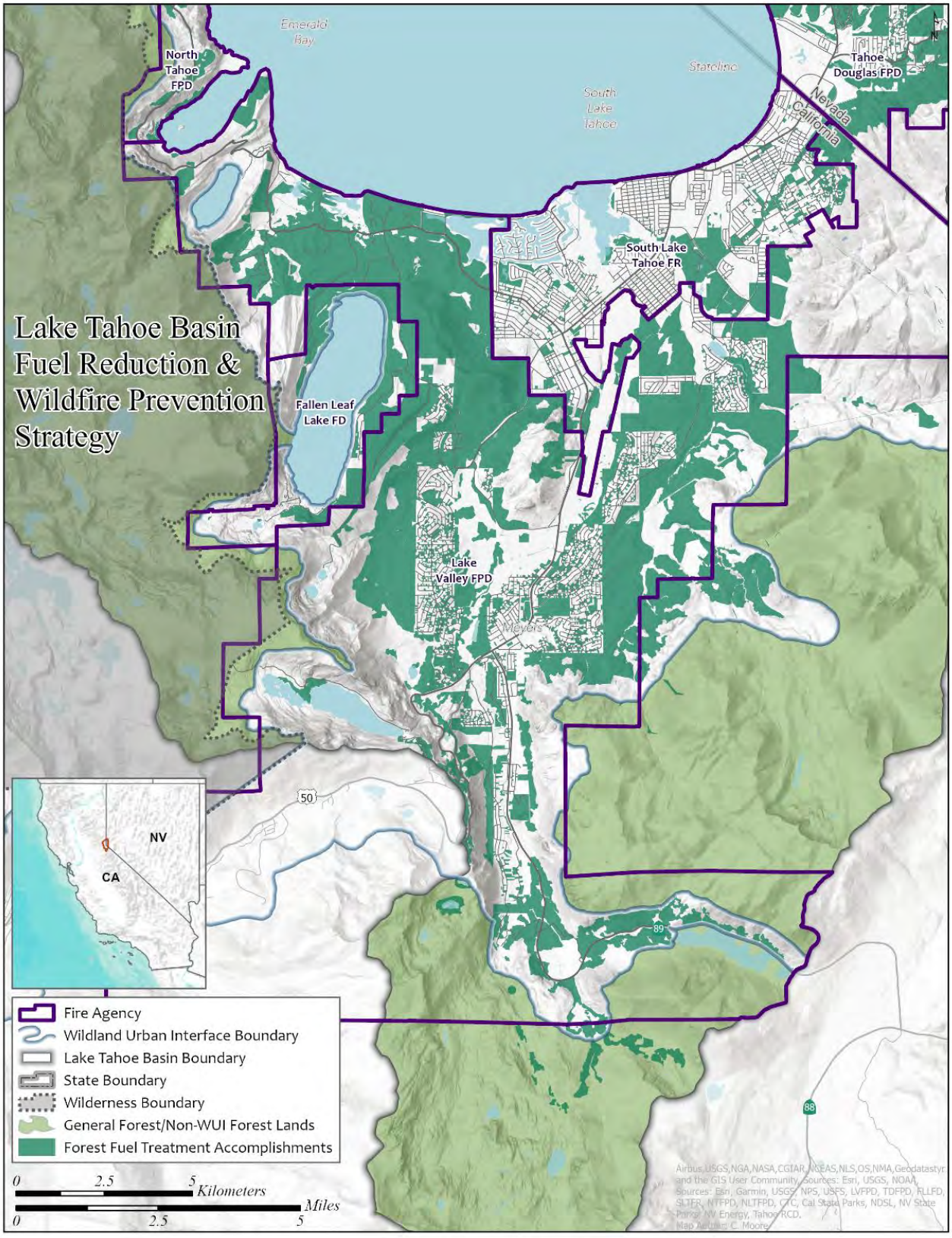


Figure 9: Forest fuel treatment accomplishments - South Shore.

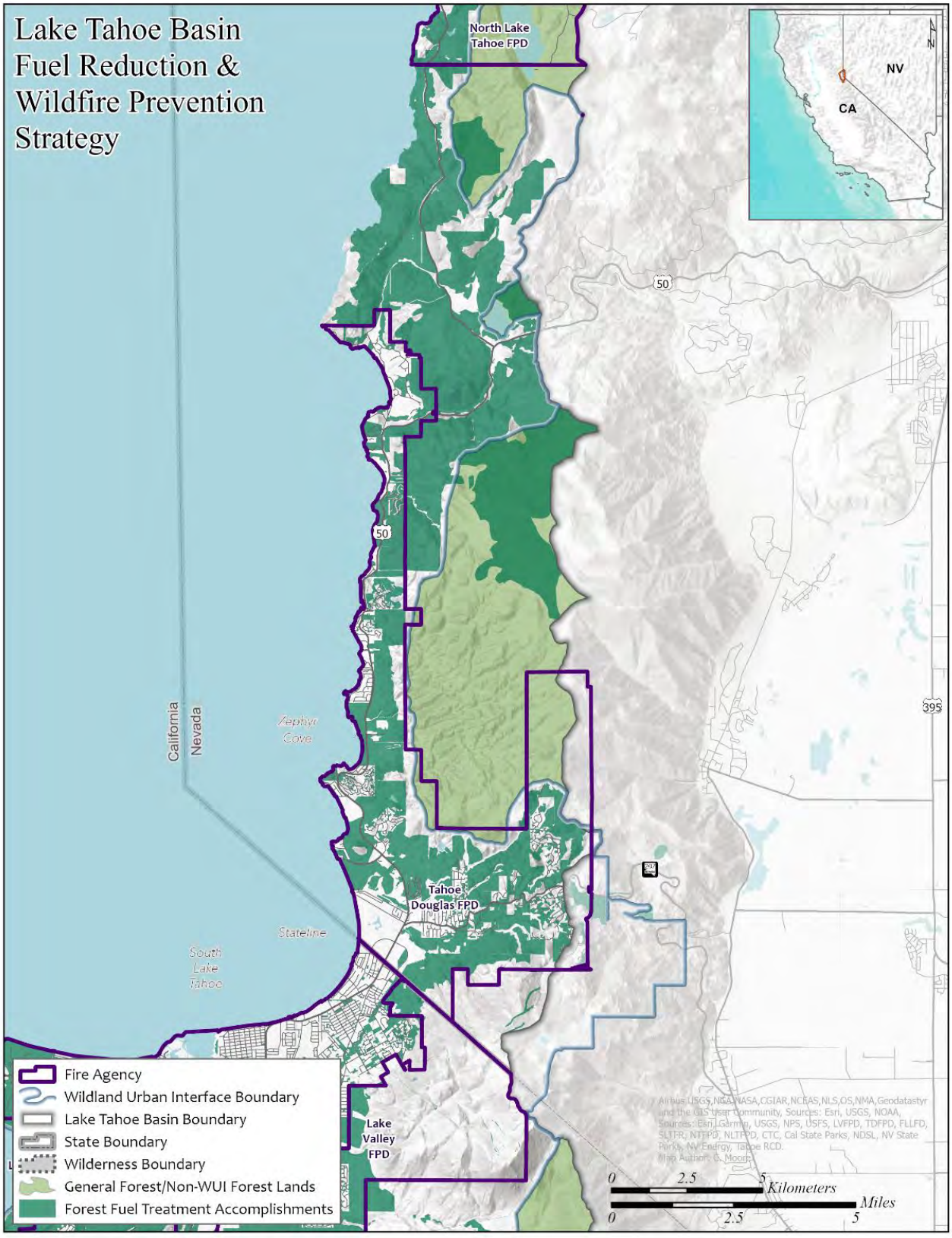


Figure 10: Forest fuel treatment accomplishments - Tahoe Douglas.

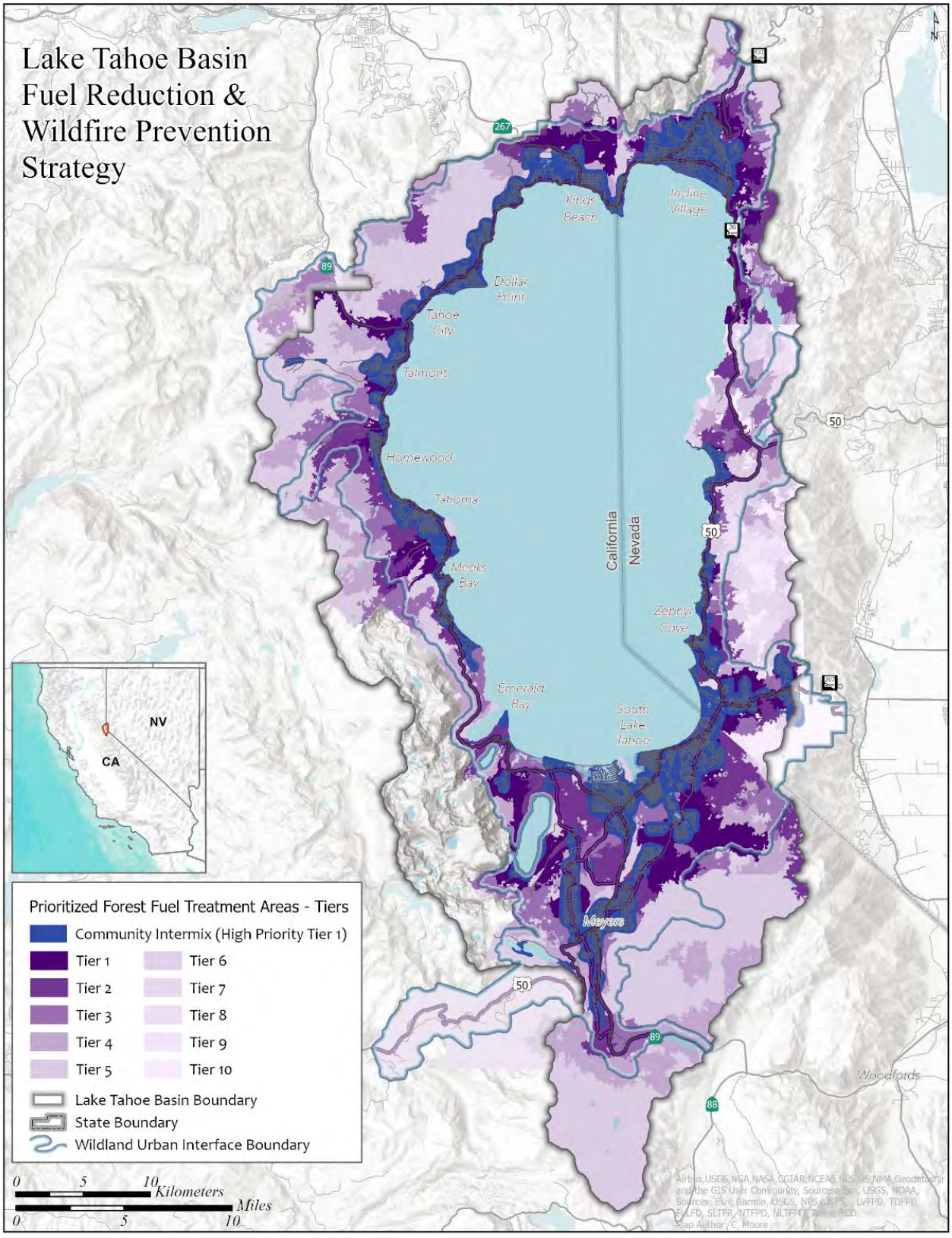


Figure 11: Prioritized treatment areas for the Lake Tahoe Basin.

Section 6: Project Scheduling

Project scheduling within the Lake Tahoe Basin follows a strategic prioritization process led by the responsible land management and fire protection jurisdictions. Highest priority is given to defense zone treatments located within the wildland-urban interface (WUI), particularly those identified in the most current Community Wildfire Protection Plans (CWPPs). However, emergent needs—such as those resulting from wildfire, wind events, beetle infestations, or other natural disturbances—may necessitate reprioritization and preempt previously scheduled projects.

Another key consideration is the time required to advance a project from conceptual design through environmental compliance, permitting, contracting, and ultimately to implementation (see flow chart at right). This process may take several months to several years, which can present challenges for coordinating implementation across multiple jurisdictions.

In general, non-federal projects are smaller in scale and can often be planned and implemented on shorter timelines. In contrast, projects led by the Lake Tahoe Basin Management Unit (LTBMU) are typically larger and more complex. However, the LTBMU has recently completed several landscape-scale planning efforts, enabling more effective coordination with non-federal partners for project implementation.

To support coordinated action, the Tahoe Fire and Fuels Team (TFFT) – a collaborative group of local fire districts, fire protection and regulatory agencies, and land managers—works closely with the Multi-Agency Coordinating (MAC) Group. These groups meet annually to develop annual work plans, which guide interagency implementation, permitting, and resource allocation. The TFFT prepares work plans based on treatment priorities identified in CWPPs, with final review and approval provided by the MAC Group.

Section 7: Projects Costs

The actual costs for projects incurred by different agencies in the Lake Tahoe Basin have been difficult to determine for several reasons. The biggest variables to overall project costs are typically treatment unit size and accessibility. Where treatment areas are large, and access is directly available for machinery, overall costs per acre tend to be lower. Within the Basin, many jurisdictions are responsible for numerous small parcels, which substantially increase their costs per acre for treatments.

Planning Costs

The costs associated with project planning include surveys (cultural, biological and physical) and project

design, environmental compliance, project layout, contracting, and monitoring. In addition, recent cost estimates have included best management practices, road maintenance, and rehabilitation of treatment area, because this aspect of land management is critical to providing safe, efficient, and minimal resource impact access for both fuels treatments and fire suppression activities.

Accurate costs for these items are difficult to establish because agencies track these costs differently. Cost estimates for planning, environmental compliance, and final layout range from $275 to $2,500 per acre, with an average of $1,725 per acre. The planning costs are generally higher for smaller parcels.

Implementation Costs

Implementation costs vary widely, primarily due to the size of the treatment parcel, with small urban lots having some of the highest treatment costs. Mitigation measures associated with environmental compliance, lack of road access, steep topography, proximity to residential areas and areas with high recreational use, limited operating seasons, and coordination between multiple agencies can add significant cost to treatments. Table 13 displays the range and average costs that have been incurred by treatment parcel size.

Table 13: Implementation costs in the Lake Tahoe Basin.

Treatment	Original Strategy Estimated Costs	Actual Costs <1 Acre Range (average)	Actual Costs >1 Acre Range (average)
Mechanical thinning	$1,000–$3,500	$2,000–$5,000 ($3,500)	$2,000–$5,000 ($3,500)
Hand thinning	$650–$3,500	$4,000–$6,500 ($5,500)	$2,500–$6,000 ($4,250)
Chipping	$200–$700	$2,500–$3,500 ($3,000)	$1,500–$3,000 ($2,250)
Mastication	$700–$1,500	$2,500–$4,000 ($3,250)	$1,500–$4,000 ($2,750)
Pile burning	$300–$700	$1,000–$3,000 ($2,000)	$500–$3,000 ($1,750)
Understory burning	$400–$1500	N/A	$400–$1,000 ($700)

Total Expenditures

The total cost (including planning and implementation costs) to achieve the 24,268 acres outlined within this Strategy is $125,227,734, with an annual average expenditure of $20,871,288 per year. Funding has come from a variety of sources, including federal, state, local, and private funding sources.

Projected Costs

Costs associated with planned treatments over the next 10 years are expected to range between $196 million to $215 million, with annual predicted expenditures of $13 million to $21 million to treat the remaining priority areas. An additional $35 million to $48 million over the next 10 years is projected to begin phased treatments on previously treated areas to maintain fire behavior modification efficacy over the next 10 years. These treatments are expected to be substantially less expensive than the initial treatments because of reduced fuel loads. Changes in funding availability will dictate the amount of work that can be accomplished.

One-third of the 69,158 acres identified in the wildland-urban interface defense zone is private or local-government owned. Contained in the private and local land areas are over 39,000 parcels less than 1 acre in size. Responsibility to create and maintain defensible space on these small lots falls to the individual property owner, creating the need for a substantial private and local investment in fuels reduction.

Section 8: Utilization Potential

The primary objectives of the proposed hazardous fuel reduction projects are to reduce the potential of a catastrophic fire, protect life and property, and restore forest health. As a result, forest materials that are removed will generally be small- to medium-sized trees, and brush. Materials that are removed may significantly reduce particulate and greenhouse gas emissions from pile burning and may provide some revenue to reduce the cost of the proposed projects, allowing public funds to be used elsewhere for hazardous fuels reduction. Potential forest products from the proposed projects include wood chips, mulch, biochar, small logs, and large logs (down to an 8" diameter top).

Biomass

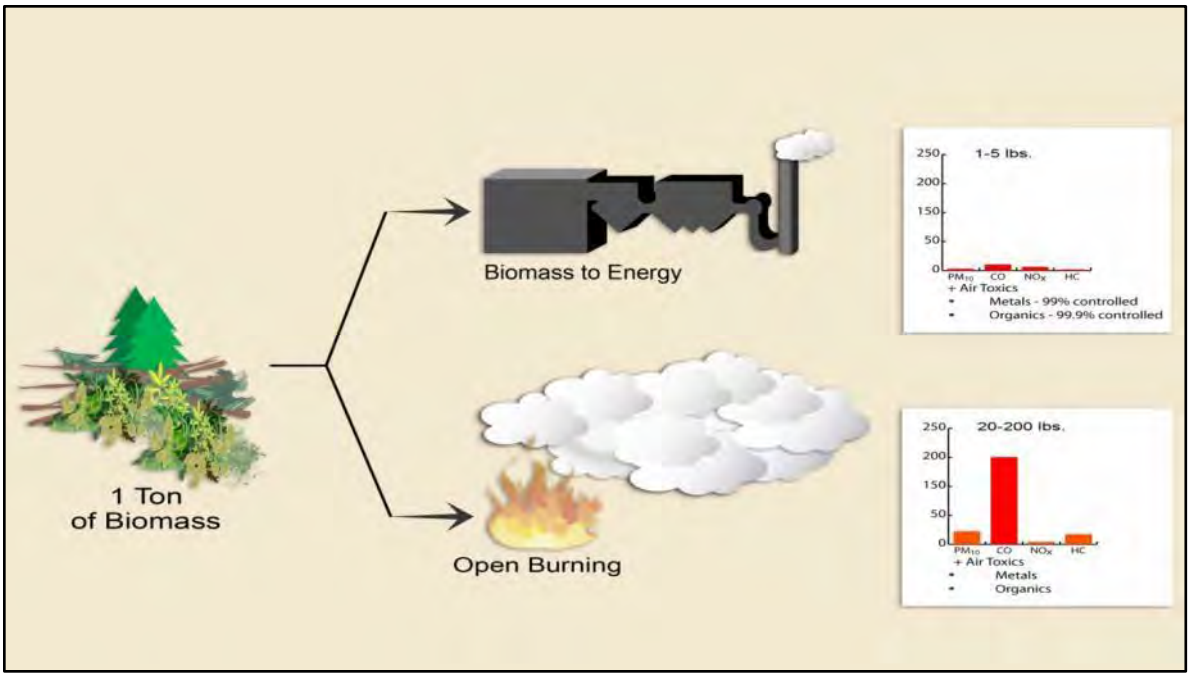
Biomass is the total amount of vegetation removed from a project. Biomass can be used to generate heat, steam, and electricity, and create products such as ethanol, soil amendments, or landscaping material. Developing a biomass facility or utilizing existing facilities in or near the Lake Tahoe Basin would be consistent with recent Federal and State policies.

There are two primary impediments to utilizing forest biomass: (1) access to remove the biomass from the site and (2) transportation costs. Removal from a site is limited by slope (mechanical operations are prohibited on slopes greater than 50 percent), availability of on-site processing sites (landings, access from suitable haul roads to the landing), and the distance to the collection point. Sufficient access for larger trucks to transport the material can be challenging in the urban environment within the Basin due to the existing infrastructure. Transportation costs are also a limiting factor, with fuel prices high and biomass demand down due to the increase in inexpensive natural gas.

Tahoe's Biomass Utilization Strategy

In 2010 the California Tahoe Conservancy (2010) convened the Lake Tahoe Biomass Working Group to develop a Lake Tahoe Biomass Utilization Strategy for the Basin. The Biomass Strategy included the following key findings:

- Current and proposed forest fuels treatments would create large amounts of forest biomass waste, a byproduct of forest treatment activities, which are piled and burned in the forest.
- Compared to pile burning, the air quality benefits of removing biomass are significant, including a 95 to 99 percent reduction in particulate matter, carbon monoxide, and volatile organics, and a 60 to 80 percent reduction in nitrogen oxides when compared to open burning (Springsteen et al. 2011) (Figure 18).
- Approximately 60,120 acres of high-priority fuels management areas contain forest materials that could be sent to a biomass facility rather than pile-burned (Figures 19 and 19a).
- A new biomass facility should be constructed near the Tahoe Basin to reduce transportation costs, the most significant barrier to biomass removal.



Picture 11: Biomass combustion air emissions; biomass to energy utilization compared to open burning. Source: Graphic courtesy of Placer County (CA) Air Pollution Control District.

Since the Tahoe Biomass Strategy was adopted in 2011, the participating agencies have moved forward with several of its key recommendations:

- The Lake Tahoe Basin Management Unit and Placer County have signed a long-term master stewardship contract, the second such agreement in the Nation, to facilitate removal of biomass from Forest Service treatments in the Tahoe and Truckee regions for energy or other purposes.
- The California Tahoe Conservancy entered into an agreement with Placer County to facilitate the removal and transport of biomass waste from forest health projects, and collected 1,944 green tons of material that was converted to 1,160 megawatts of electrical energy (enough to power 115 homes for 1 year).
- Placer County has developed final plans for the construction of a new small-scale heat and power facility near Truckee, California. The facility will be powered entirely by woody biomass generated from forest health projects in the Lake Tahoe and Truckee regions, and would utilize approximately 17,000 bone-dry-tons per year (approximately 34,000 green tons). Construction on the facility is expected to begin in 2015, and potential markets include thermal and electrical power, soil amendments, and carbon filtration products.
- The California Tahoe Conservancy funded a GHG emissions inventory in 2012, which generated baseline values of the carbon stocks associated with Tahoe's forested lands (California Tahoe Conservancy 2013).
- In 2014 the Tahoe Conservancy, in partnership with the Basin's fire districts and land management agencies, prepared the Lake Tahoe Cap-and-Trade Investment Plan for Forest Health and Bioenergy to provide the California share of funding for the Strategy.

A lack of biomass facilities has limited the options for utilizing biomass, thereby necessitating the use of prescribed fire. However, the use of prescribed fire in the basin is limited by a variety of factors, such as air quality restrictions, favorable weather conditions, and available resources leading to a backlog of unburned piles. As more projects are completed, the need for prescribed burning is anticipated to increase to maintain the efficacy of treated areas.

There has been a significant investment in Tahoe Forest Products, a wood product facility located in Carson City, Nevada. With a facility located significantly closer to active implementation than in the past, ongoing coordination is a priority to evaluate treatment methods to support local infrastructure, and ensure wood products are utilized where feasible, economical, and efficient.

Firewood

Agencies may also make available material that could be classified as biomass or small logs (see below) as firewood. For example, Nevada Division of State Lands provides, when possible, firewood generated from treatments to residents. This benefits Nevada Division of State Lands by removing the material from the treated parcel as well as benefiting the public by providing a resource at no cost. In addition, Nevada State Parks offers approximately 100 cords of firewood each year at a cost of $62 per cord. Local fire agencies, state agencies, and the Forest Service make firewood available. Firewood gathering is limited by how far individuals are willing to carry the firewood, making many of the treatment sites unsuitable for firewood gathering.

Small Logs

Small logs have been used to produce pulp, veneer for laminated lumber, oriented-strand board, posts and poles, and sawn lumber. Sawn lumber provides the lower economic return because the juvenile wood that is sawn is subject to extensive warping and cupping. Posts and poles are less susceptible to warping than sawn lumber; however, there is a lack of information on structural use and how to fasten and secure round pieces of wood in traditional structures (USDA Forest Service 2000b).

Sawlogs

Fuel reduction treatments in the Lake Tahoe Basin generally emphasize removal of small, suppressed, and intermediate trees through prescriptions that thin from below. These treatments will include removal of trees greater than 10 inches in diameter (at breast height) that can be sold as timber. Currently there are three mills in the general region that can purchase timber:

Log Facility	**Distance**	**Estimated Haul Time**
Sierra Pacific Industries – Lincoln, CA	South Shore: 107 miles North Shore: 95 miles	South Shore: 2.5 hours North Shore: 2 hours
Sierra Pacific Industries – Quincy, CA	South Shore: 112 miles North Shore: 80 miles	South Shore: 3 hours North Shore: 1.5 hours
Tahoe Forest Products – Carson City, NV	South Shore: 28 miles North Shore: 29 miles	South Shore: 1 hour North Shore: 1 hour

In general, small logs and short logs from cut-to-length logging receive the lowest price from log buyers, and as of May 2014 receive $450 per 1,000 board feet. A standard, short-log trailer holds approximately 3,000 board feet of timber, and thus can haul approximately $1,350 worth of timber. Trucking costs are

approximately $138 per hour, and thus each load of timber nets about $690 per load. Typically, the contractor will reduce the price charged per acre by the net value of the timber. However, with treatment costs of up to $4,200 per acre, the value of saw logs only
offsets a small portion of total costs.

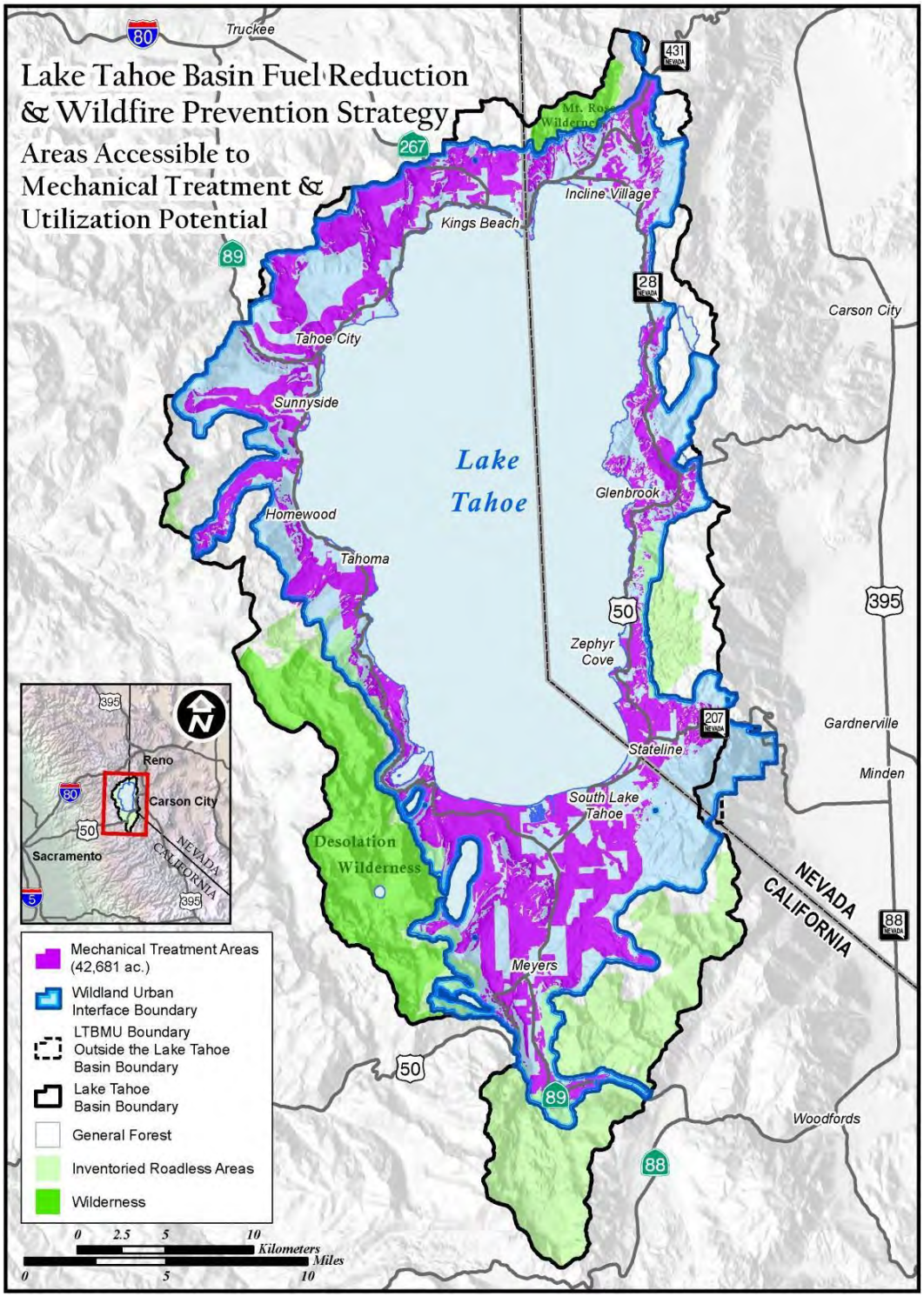


Figure 12: Areas accessible to mechanical treatment and utilization potential (0-30%) slopes).

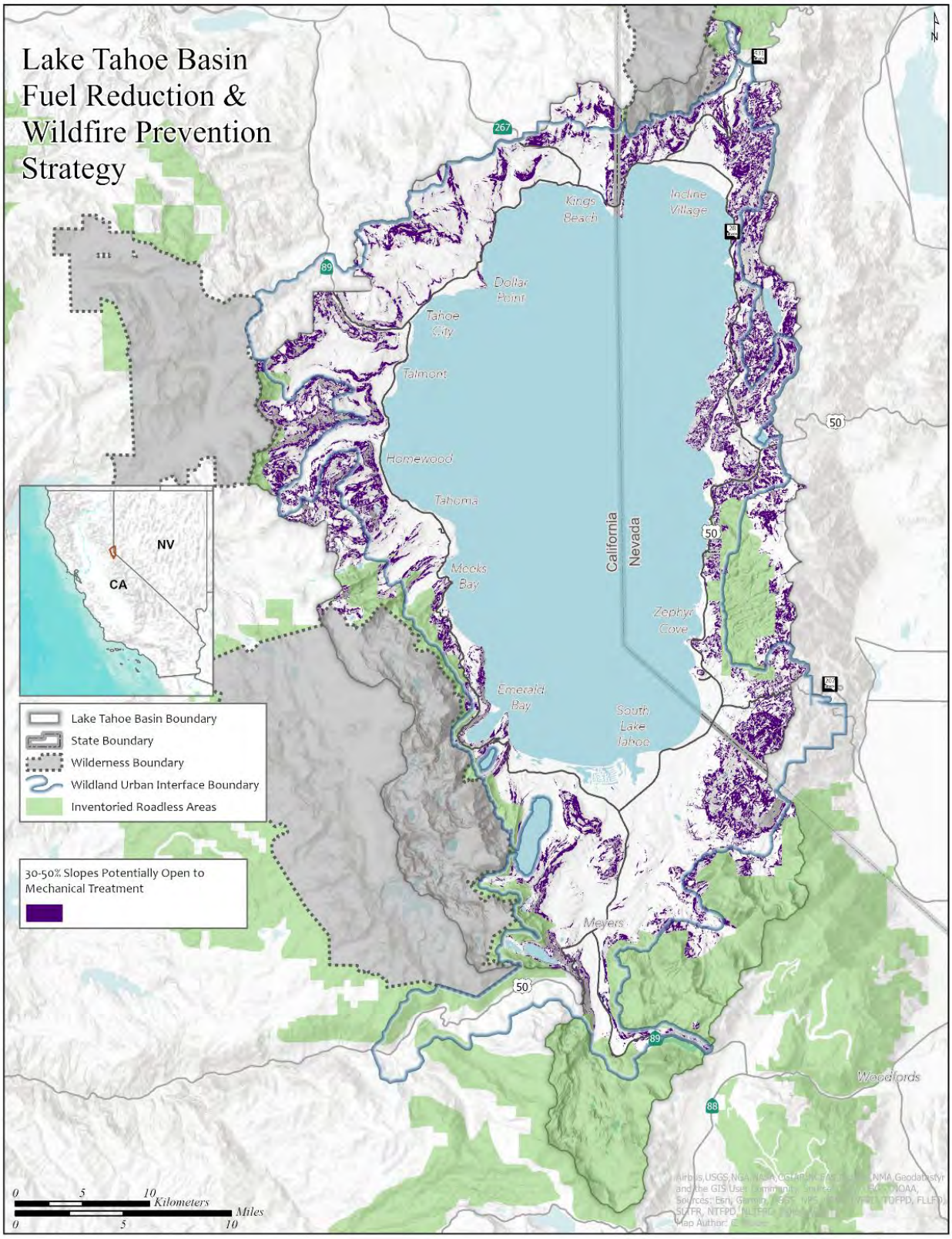


Figure 13: Potential areas for mechanical treatment and utilization potential (30-50% slopes).

Section 9: Public Education and Wildfire Prevention

Key to the success of the proposed community defense and general forest-based treatments in this Strategy is continued public outreach and education directed at private landowners regarding their responsibility to create defensible space and home hardening. Since the implementation of the Strategy and the creation of the Tahoe Network of Fire Adapted Communities, the percentage has improved greatly, but there are still many residences that do not have adequate defensible space. While defensible space clearing around rural residences has been the law for some time in California, it has only been enforced since 2009 in the Tahoe Basin. Local Fire Protection Districts in Nevada have adopted the 2018 International Wildland Urban Interface Code.

Most of the Basin's residents elect to live in Lake Tahoe because of the rural setting or the diverse recreation opportunities. Many of them have preconceived notions on how a healthy forest looks. Federal and state policies strongly advocated fire suppression. Media attention of extensive clearcut logging on public lands in the 1970s and 1980s initiated a common belief that all logging sacrificed irreplaceable natural resources. The public associate fuels hazards only with large, standing dead trees, and do not associate live green brush, down woody material, and pine needles/litter as the primary fuel loading. This perception makes it difficult to understand the need for defensible space treatments, and the need to remove these fuel components from around their structures. However, with the recent increase in destructive wildfires and over 16 years of messaging from the Tahoe Fire and Fuels Team Fire Public Information Team, the public is shifting its perception of fuel reduction/forest health treatments and prescribed fire. This positive shift in public perception has also led to communities acting and doing their part in creating defensible space and home hardening actions.

The efforts of Federal, State, and local agencies and organizations have made substantial progress to reduce fuel hazards and educate the public. Currently, Federal and state land management agencies, as well as state and local fire agencies in the Basin, develop and provide information in various formats to educate the public regarding fire prevention.

The National Cohesive Wildland Fire Management Strategy identified the need to create fire-adapted communities as one of three goals to address wildfire problems at the landscape scale and, as stated previously in this strategy, the Tahoe Network of Fire Adapted Communities has been successful at preparing communities for wildfire since 2017.Other resources and programs available to communities are the "Ready, Set, Go" program, developed by the International Association of Fire Chiefs,. The Nevada Cooperative Extension "Living with Fire" program, the 2025 Lake Tahoe Basin Community Wildfire Protection Plan, and the National Fire Protection Association's Firewise USA Program.

Following the 2007 Angora Fire, it became apparent that one of the public education challenges was delivering a consistent message that is easy for the public to understand. Using the standard messaging of "Living with Fire," "Fire Adapted Communities," and "Ready, Set, Go" ensures that the public receives consistent messages regarding defensible space and emergency preparedness. The effort to deliver a consistent message will be bolstered by the participation of all the Strategy's partner agencies in the public information function of the Tahoe Fire and Fuels Team, which is termed the "Fire PIT" (Fire Public Information Team). The Fire PIT serves as a joint information center for all agencies involved in fuels reduction in the Basin.

The Forest Service (LTBMU) is responsible for, and provides wildfire suppression, for Federal responsibility areas in both California and Nevada. CAL FIRE is responsible for and provides wildfire suppression for "state responsibility area" lands in California within the Basin. CAL FIRE has two

permanently funded fire engines in the Tahoe Basin, one located on the South Shore and the other located on the North Shore. In addition, CAL FIRE supports a full-time division chief/registered professional forester in the Basin who enforces Public Resources Code §4291 and oversees two seasonal defensible space inspectors and a fire captain specialist for planning and building code enforcement. Nevada Division of Forestry has responsibility for protection of state lands on the Nevada side of the lake, which the local fire protection districts provide through cooperative agreements.

Seven fire protection districts provide municipal fire protection in Lake Tahoe: South Lake Tahoe Fire Department, Lake Valley Fire Protection District (Meyers), Fallen Leaf Lake Fire Department, Meeks Bay Fire Protection District, North Tahoe Fire Protection District (Tahoe City), North Lake Tahoe Fire Protection District (Incline Village), and Tahoe-Douglas Fire District (Spooner Summit to Stateline, Nevada). The Lake Tahoe Basin Management Unit and CAL FIRE work cooperatively with all local government fire agencies on mutual aid, public education, and Basin wide community fire planning, including hazardous fuel reduction.

Current Efforts

Tahoe Network of Fire Adapted Communities

Tahoe Resource Conservation District (TRCD) manages the Tahoe Network of Fire Adapted Communities and passes funding through the Fire Protection Districts to develop and manage their Defensible Space and Chipping Programs.

Fire Prevention Plans

Each cooperating fire protection agency has, to varying extents, developed a wildfire prevention plan. For example, the USDA Forest Service has developed a comprehensive prevention plan that focuses on administration, detection, education, engineering, enforcement, and origin and cause determination for fire investigation. This plan details patrolling, media outreach, public education, and annual public events that the Lake Tahoe Basin Management Unit (LTBMU) actively supports. The plan is implemented by a dedicated prevention staff that includes three fire prevention technicians and a fire prevention officer. In another example, CAL FIRE's Fire Prevention Program includes fire engineering, vegetation management, fire planning, education, and law enforcement. CAL FIRE's fire planning incorporates concepts of the National Fire Plan, the 2010 California Strategic Fire Plan, and individual CAL FIRE unit fire prevention plans, as well as community wildfire protection plans. The Amador-El Dorado Unit Fire Plan and the Nevada-Yuba-Placer unit fire plans outline fire situations at the local level, including the North Shore and the South Shore of Lake Tahoe in California. Each identifies prevention measures to reduce risks, educates and involves the local community or communities, and provides a framework to diminish the potential loss due to wildfire.

All the local fire agencies have adopted the community wildfire protection plans as their primary wildland fire prevention and mitigation documents. They also all have prevention departments that are responsible for enforcing the building codes in their respective jurisdictions. All the local fire jurisdictions require ignition-resistant construction as per the California Building Code Chapter 7A or the International Wildland Urban Interface Code. All new construction and significant remodels are required to follow the applicable building standards for their area. Additionally, anyone who is planning a project that requires a Tahoe Regional Planning Agency permit must first provide their local fire department a site plan that includes plans for creating defensible space.

One-on-One Contacts

CAL FIRE and local government fire districts have personnel that meet with individual homeowners during defensible space inspections. While these contacts are time consuming, they are the most effective means for providing information to homeowners because they are tailored to the individual property. Additionally, these organizations also provide free literature to residents, including "Fire Adapted Communities – the Next Step in Wildfire Preparedness". The Nevada Division of State Lands also publishes and makes available a programmatic brochure that explains fuels management as part of its community outreach. USFS Fire Patrols also actively patrol the National Forests year-round.

Community Events and Work Days

The local fire protection agencies, the Tahoe Regional Planning Agency, and USDA Forest Service and state agencies participate in annual wildfire awareness and education events throughout the Tahoe Basin. These events can be as simple as small community barbecues with a defensible space demonstration yard, to very elaborate Wildfire Awareness Week events with hundreds of visitors and entertainment such as hot air balloon rides. A variety of events are planned each year to educate the community about the need for defensible space and ignition-resistant construction and how to actually do the work required to create defensible space.

Websites and Public Service Announcements

CAL FIRE, USDA Forest Service, Tahoe Regional Planning Agency, and the local government fire agencies host websites that offer extensive information on defensible-space inspections, defensible- space requirements, grant-funded-chipping services to dispose of defensible space hazardous fuels, and links to other sources of information. The most common link is to http://www.livingwithfire.info/tahoe/, a University of Nevada sponsored website that provides extensive information on what residents should do before, during, and after a wildland fire. All of the agencies also support and participate in public service announcements that focus on defensible space requirements and public safety.

Future Efforts

Home hardening inspections detailed with a prioritized report on individual needs, implementation of a program to help homeowners install 0-5 foot noncombustible zones, Fire PIT campaigns and messaging, and individual homeowners evacuation planning are all future efforts that will need funding.

The current efforts have resulted in substantially more residents complying with the defensible space requirements. Additional efforts will be required in the future to obtain defensible space compliance from the large number of absentee residents whose periodic visits focus on recreation. Efforts should also be focused on educating residents about changing the current forest conditions to restore the health of those forest stands and encouraging residents to develop defensible space around their homes. Therefore, an effective education program will be continued that addresses the following two paradigms:

- It is the responsibility of landowners to create and maintain defensible space around their structures (required in California per Public Resources Code 4291, and in Nevada by the International Wildland Urban Interface Code); and
- Lake Tahoe's forest ecosystems and watersheds will thrive under a managed disturbance regime.

These messages are consistent with the Cohesive Strategy and specifically address the core concepts of "Fire Adapted Communities" and resilient landscapes.

Section 10: Environmental Regulations and Compliance

All individual projects designed to reduce fuel hazards that are proposed by public agencies; funded by public agencies; or that require Federal, state, local, or local discretionary approval; will be subject to Federal, state, or regional environmental regulations. These regulations shape the scope, location, methodologies, timing, and cost of proposed fuel reduction treatments in the Basin.

Environmental regulations (such as the Clean Water Act, Clean Air Act, California Forest Practices Act, Nevada Forest Practices Act, and Endangered Species Act; and Tahoe Regional Planning Agency Code of Ordinances) are designed to analyze and disclose impacts on the environment and allow the public to participate in agency decision-making processes that may affect the environment (for example, National Environmental Policy Act and California Environmental Quality Act). Because of the unique values at risk in the Lake Tahoe Basin and complex land ownership, there are numerous regulations governing fire mitigating activities in the Basin. Unlike other areas in the United States, in addition to Federal and state laws, the bi-state governing Tahoe Regional Planning Agency has a comprehensive code of ordinances that prescribes rules for forest thinning and vegetation management on residential and commercial properties. The extent of environmental compliance is determined by the landownership where the project is occurring, the funding agency, and the complexity of the project (Figure 20).

National Policies and Regulations

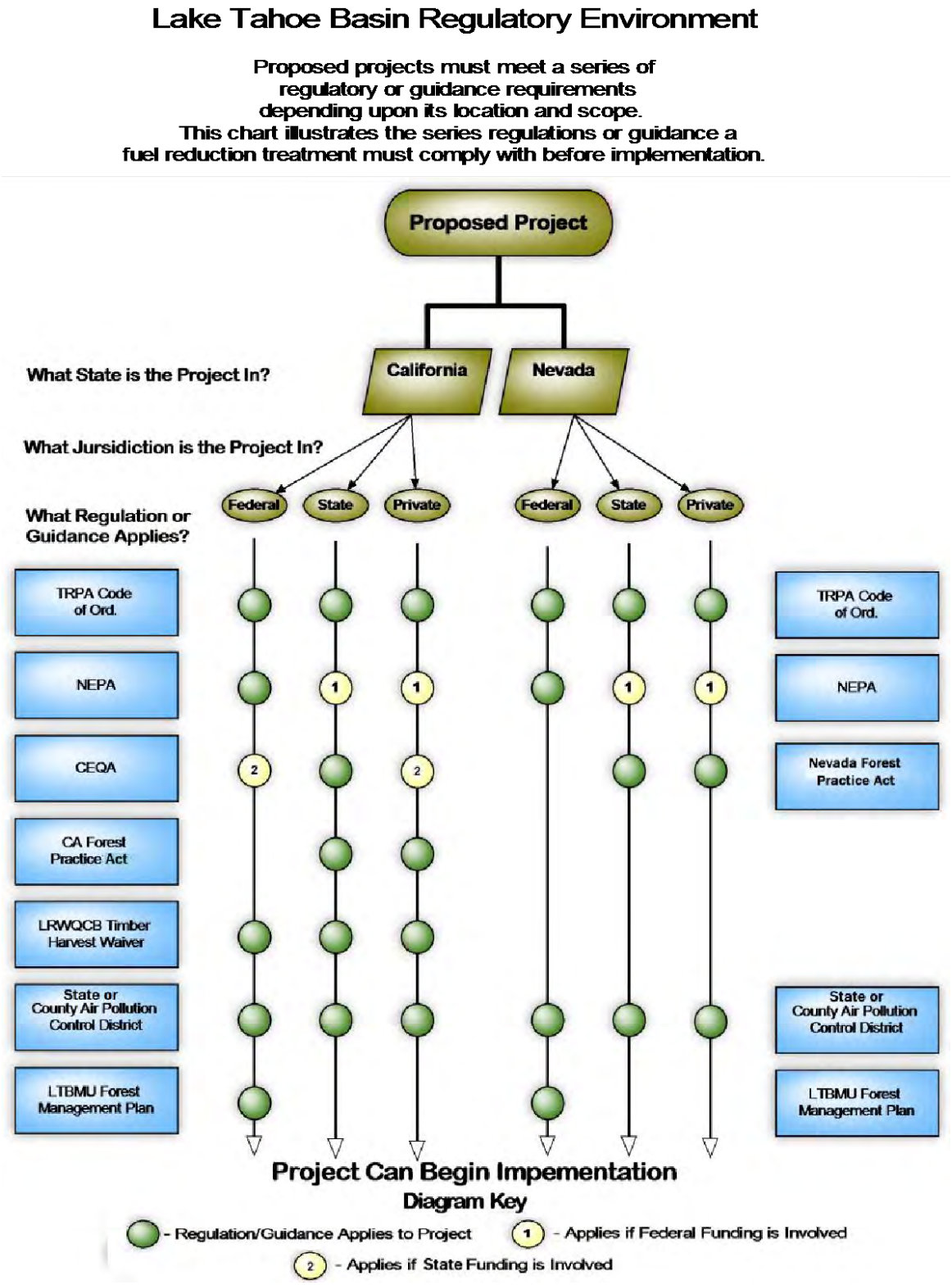
Several national policies and regulations guide wildland fire management; they include:

- The National Fire Plan, 10-Year Comprehensive Strategy (USDI and USDA 2001).
- National Fire Plan 10-Year Comprehensive Strategy Implementation Plan (USDI and USDA 2002).
- Federal Wildland Fire Policy (USDI et al. 1995 [updated 2001]).
- Healthy Forests Initiative (2002).
- Healthy Forests Restoration Act (2003).
- Protecting People and Natural Resources: A Cohesive Fuels Treatment Strategy (USDI and USDA 2006).

This Strategy is consistent with all policies and regulations described below.

The National Fire Plan and 10-Year Comprehensive Strategy

The National Fire Plan was developed by the U.S. Department of the Interior and U.S. Department of Agriculture in 2000 (USDI and USDA 2000) to actively respond to severe wildland fires and their impacts to communities, while ensuring sufficient firefighting capacity for the future. It provided direction for the identification of “communities at risk”, which are located in the vicinity of Federal lands where wildland fires have the potential to threaten adjacent private lands. Identifying communities at risk has assisted planning for fuel reduction projects on Federal lands and increased awareness of wildfire threats in those communities. Communities at risk in the Lake Tahoe Basin are Incline Village, Crystal Bay, Sand Harbor, Glenbrook, Kingsbury, South Lake Tahoe, City of South Lake Tahoe, Homewood, Tahoe Pines, Sunnyside, Tahoe City, Dollar Point, Carnelian Bay, Tahoe Vista, and Kings Beach (*Federal Register* 66(160): 43384-43435).



Picture 12: Diagram of the regulatory influences on fire and fuels management in the Lake Tahoe Basin.

National Environmental Policy Act

All fuel reduction projects funded by the Federal government that occur on Federal land (such as Lake Tahoe Basin Management Unit), or require a federal agency to issue a permit, must comply with the National Environmental Policy Act (NEPA). NEPA requires agencies to prepare environmental impact statements, environmental assessments, or categorical exclusions, to evaluate potential impacts of proposed projects on the quality of the human environment. These analyses may be used to satisfy other requirements as required by the Tahoe Regional Planning Agency or the California Environmental Quality Act.

The Healthy Forest Restoration Act (H.R. 1904, December 2003)

The Healthy Forest Restoration Act (The Act) simplifies the NEPA process by limiting the range of alternatives required to be considered in an environmental document for fuel reduction or forest health projects designed to protect communities, watersheds, or endangered or threatened species from wildfire. The Act also changed the Forest Service administrative appeal process for NEPA decisions to a simpler objection process.

The Act allows communities to designate their wildland-urban interface, authorizes fuel reduction projects on Federal lands in the wildland-urban interface, requires Federal agencies to consider recommendations made by communities at risk that have developed community wildfire protection plans and gives funding priority to communities that have adopted community wildfire protection plans. At the Lake Tahoe Basin Wildfire Prevention Summit on March 13, 2004, fire officials from Lake Tahoe accepted the challenge to develop community wildfire protection plans for their communities. Community wildfire protection plans were prepared for and approved by the state fire and forestry agencies, the fire protection districts, and fire departments in the Basin (Resource Concepts, Inc. 2004a, 2004b; C.G. Celio & Sons et al. 2004). These community wildfire protection plans were updated concurrently with the Strategy update to ensure the most recent information was considered. Environmental assessments and environmental impact statements documenting the Act-authorized projects may consider only one action alternative if that alternative meets certain wildland-urban interface criteria and implements the general actions of an applicable community wildfire protection plan.

Lake Tahoe Restoration Act (H.R. 3388, 24 January 2000)

The purposes of this Act are to (1) enable the Forest Service to plan and implement significant new environmental restoration activities and forest management activities to address water quality and the forest fuels that have significantly increased the risk of catastrophic forest fires; and (2) to ensure that Federal, state, local, regional, tribal and private entities continue to work together to improve water quality and manage Federal land in the LTBMU.

Regional Policies and Regulations

Regulations and policies pertaining to fuels reduction and wildfire prevention are dynamic and the applicability of regulations and policies within California is expected to change over the coming decade. Recent developments of note include Governor Newsome's Emergency Proclamation on March 1, 2025, which authorizes the Secretaries of the California Natural Resources Agency (CNRA) and the California Environmental Protection Agency (CalEPA) to determine which projects are eligible for suspension of certain State of California statutory and regulatory requirements to expedite critical fuels reduction projects. Project implementors are encouraged to work with staff at appropriate regulatory agencies to determine compliance requirements for specific projects.

Tahoe Regional Planning Agency Regional Plan Thresholds and Carrying Capacities

The Tahoe Regional Planning Agency's (TRPA) "threshold carrying capacities" are standards of environmental quality targets to be achieved in the Tahoe Region. The standards identify the level of human impact the Lake Tahoe environment can take before irreparable damage occurs. The thresholds and carrying capacities identify common vegetation, uncommon plant communities, sensitive plants, and late-seral, old-growth ecosystems.

Tahoe Regional Planning Agency Code of Ordinances

The Tahoe Regional Planning Agency (TRPA) primarily regulates tree removal through chapter 61 of its code of ordinances. Removal of all live trees greater than 14 inches in diameter requires a tree removal permit; however, TRPA has delegated authority to issue tree removal permits to the local fire agencies for defensible space treatments. A tree removal permit must be approved by TRPA for all projects that require substantial removal of trees, which is defined as removing more than 100 trees greater than 14 inches in diameter.

Lake Tahoe Basin Management Unit Land Management Plan

All management activities conducted by the Forest Service are governed by the 1988 Lake Tahoe Basin Management Unit Land and Resource Management Plan (Plan). The current direction comes from the 1988 plan as amended by the 2004 Sierra Nevada Forest Plan Amendment. The Plan recognizes the excessive buildup of fuel hazards in the Sierra Nevada Mountains surrounding the lake and established that the highest priority for fuels treatments would be in the wildland-urban interface areas. The new Plan is posted on the Lake Tahoe Basin Management Unit website: https://www.fs.usda.gov/r05/laketahoebasin/planning The new Plan direction is consistent with this Strategy.

California Environmental Quality Act (CEQA)

Fuel reduction projects on privately owned and non-Federal publicly owned lands in California that require environmental approvals from a local or state agency must comply with CEQA or a functionally equivalent program (such as the California Forest Practice Act as in the case of commercial timber harvesting or the Lahontan Timber Waiver which applies to commercial timber harvest and non-commercial vegetation management). In some cases, a California Forest Practice Act harvesting document, such as a timber harvest plan, is required to be prepared in lieu of a traditional CEQA document when harvested material has a commercial purpose. The harvesting document must be prepared and signed by a California registered professional forester before submittal to CAL FIRE for review and approval or denial. Furthermore, in such circumstances, timber operations must be conducted by a California licensed timber operator. Some projects not resulting in ground disturbance, such as defensible space clearance and non-commercial hand thinning fuel reduction work, are generally exempt from CEQA or a functionally equivalent program. In addition, there are opportunities to complete CEQA and NEPA documents using joint analysis.

California Forest Practice Act

The California Forest Practice Act and its rules and regulations are the California statute regulating timber harvesting in California on non-Federal timberlands. The practice of cutting or/and removing native conifer trees for commercial purposes, as well as the conversion of timberland to a non- growing use on non-Federal timberlands in California, requires the preparation and approval of a harvesting document as per California Public Resource Code §4527. Nearly all harvesting documents submitted to CAL FIRE for approval must be prepared and signed by a California registered professional forester. All harvesting

documents must be signed by a licensed timber operator who must also conduct harvesting operations.

California Public Resource Code §4291 applies to all landowners who own or maintain structures on state responsibility area lands. California Public Resource Code §4291 requires these landowners to maintain a defensible space around all structures each year to reduce the risk of damage or destruction caused by wildfire. Inspection and enforcement of California Public Resource Code §4291 is conducted annually by Tahoe Basin-assigned CAL FIRE personnel and California Tahoe Basin local government fire agencies.

Water Quality Control Plan for the Lahontan Region

The California Water Quality Control Board sets California policy for the implementation of state and Federal clean water laws and regulations. The Lahontan Regional Water Quality Control Board (Lahontan Water Board) is responsible for protecting water quality and enforcing the California Water Code and the Clean Water Act. It enforces its water quality control plan within the Lahontan Region of California, which extends east of the Sierra Crest to the Nevada border and from the Oregon border south to the Mojave Desert. The Water Quality Control Plan for the Lahontan Region (Basin Plan) identifies specific prohibitions for waste discharge within individual watersheds. Permits issued by the Lahontan Water Board may include conditional exemptions to waste discharge prohibitions identified in the Basin Plan.

Nevada Division of Forestry NRS 527 and 528

Nevada Revised Statute (NRS) section 527 protects timber lands and threatened and endangered plants and authorizes prescribed fires on state and private land in Nevada. NRS 528 creates the Nevada Forest Practice Act that regulates forest practices and reforestation on private and state lands in Nevada. Commercial forest thinning projects, or projects that propose removing trees from within 200 feet of a designated stream, must comply with the provisions of the Nevada Forest Practice Act (Act). The purpose of the Act is to ensure that (1) the timber resources in the State of Nevada are adequately protected; (2) water resources are protected during harvesting activities; and (3) project best management practices are followed. Any forest thinning project that takes place in Nevada that has a commercial component must apply for a logging permit and will likely have to issue a performance bond to cover the cost of any potential remediation that could be prescribed by the Nevada Division of Forestry.

Nevada NRS 477.030

In 2009 the State of Nevada adopted rules requiring the state fire warden to cooperate with the local fire districts on the Nevada side of the Tahoe Basin to create and enforce defensible space regulations. The State of Nevada then adopted the provisions of the International Wildland Urban Interface Code that prescribe defensible space standards at Nevada Administrative Code 477.281.

Agency Responsibilities

Several land management and regulatory agencies are responsible for complying with and enforcing regulations in the Lake Tahoe Basin. The land management agencies include the USDA Forest Service, Nevada Division of Forestry, California Tahoe Conservancy, and California State Parks.
The regulatory agencies include the Tahoe Regional Planning Agency, Lahontan Regional Water Quality Control Board, local fire agencies and CAL FIRE.

Land Management Agencies

USDA Forest Service Lake Tahoe Basin Management Unit

The USDA Forest Service Lake Tahoe Basin Management Unit (LTBMU) is responsible for managing approximately 75 percent of the land base and its resources in the Lake Tahoe Basin. All management activities conducted by the LTBMU are governed by the Lake Tahoe Basin

Management Unit Land and Resource Management Plan.

California State Parks

There are nine park units under the ownership of California State Parks within the Lake Tahoe Basin (listed from north to south): Kings Beach State Recreation Area, Burton Creek State Park, Tahoe State Recreation Area, Ward Creek (unclassified unit), Ed Z'berg Sugar Pine Point State Park, D.L. Bliss State Park, Emerald Bay State Park, Washoe Meadows State Park, and Lake Valley State Recreation Area. The mission of California State Parks is to provide for the health, inspiration, and education of the people of California by helping to preserve the State's extraordinary biological diversity, protecting its most valued natural and cultural resources, and creating opportunities for high-quality outdoor recreation. California State Parks seeks to maintain natural ecosystem processes that form and maintain natural resources, including reintroduction of fire when feasible and safe to help manage and maintain healthy forests.

California Tahoe Conservancy

The California Tahoe Conservancy (Conservancy) is an agency within the Natural Resources Agency of the State of California. Its jurisdiction extends only to the California side of the Lake Tahoe Basin. It was established to develop and implement programs through acquisitions and site improvements to improve water quality in Lake Tahoe, preserve the scenic beauty and recreational opportunities of the region, provide public access, preserve wildlife habitat areas, and manage and restore lands to protect the natural environment.

The properties managed by the Conservancy within the Basin consist of about 4,800 parcels; of which the average size is one-third acre or less. Most of these parcels are within the wildland-urban interface. The Conservancy is also responsible for planning and implementing projects on their respective lands that restore ecosystem health by reducing fuel hazards. They are responsible for ensuring their plans are consistent with Federal, state, and local laws, regulations, and policies.

Nevada Division of Forestry

The Nevada Division of Forestry manages all forestry, nursery, endangered plant species, and watershed resource activities on certain public and private lands within the Basin. The Division also provides fire protection of natural resources through fire suppression and prevention programs. The Nevada Division of Forestry is responsible for enforcing Nevada Revised Statutes (NRS) 527 and 528.

The Nevada Tahoe Resource Team, an interagency team within the Department of Conservation and Natural Resources, is responsible for implementing forest health and fuel reduction projects on State of Nevada property in the Lake Tahoe Basin.

Nevada State Parks

The Nevada Division of State Parks administers and manages four state parks inside the Lake Tahoe Basin that include beaches, fishing, and camping, and over 13,000 acres of backcountry recreation. Nevada State Parks, in conjunction with the Nevada Tahoe Resource Team, has prepared a plan to reduce fuel hazards and restore forest health in the following parks at Lake Tahoe: Sand Harbor, Spooner Lake and Backcountry, Cave Rock, and Van Sickle Bi-State Park.

Nevada Division of State Lands

Nevada Division of State Lands manages 490 urban parcels in the Lake Tahoe Basin from Crystal Bay to

Stateline, Nevada. These are managed by the Nevada Tahoe Resource Team (see above). Urban parcels are managed by the State Lands forester. There are 141 urban parcels (115 acres) in Douglas County and 349 urban parcels (110 acres) in Washoe County. These conservation areas are managed in accordance with a Tahoe Regional Planning Agency Memorandum of Understanding, Nevada Laws on Forestry and Fire, and Nevada Revised Statues 472, 527 and 528 which pertain to forest restoration and watershed protection of trees and flora through accepted forest practices.

Local Fire Protection Agencies

The local fire protection agencies of the Tahoe Basin have agreed to represent local government and private landowners who seek to create defensible space or who wish to thin forests adjacent to communities. While there is no statutory requirement for the fire agencies to actively manage private and local lands, all of the agencies have agreed to do so. Thus, the local fire agencies manage the largest land mass in the defense zone when considering defensible space and fuels reduction in the wildland-urban interface. In Nevada, the International Wildland Urban Interface Code adopted by the state, does not include the building construction provisions found in chapter 5. The populated counties in the Basin have adopted the Wildland Urban Interface Code including chapter 5 (with amendments).

Regulatory Agencies

Tahoe Regional Planning Agency

The Tahoe Regional Planning Agency (TRPA) is a bi-state agency created by the states of Nevada and California to lead a cooperative effort to preserve, restore, and enhance the unique natural and human environment of the Lake Tahoe Basin. TRPA leads and convenes the Environmental Improvement Program, which works to accelerate the pace and scale of restoration and achieving environmental threshold attainment.

Lahontan Regional Water Quality Control Board

The Lahontan Regional Water Quality Control Board is responsible for water quality and enforcing the California State Water Code. It regulates forest management practices and activities on stream environment zones using waste discharge requirements (WDRs) and waivers of WDRs, which include the Lahontan Timber Waiver.

California and Nevada Air Quality Regulatory Agencies

Air quality in the Tahoe Basin is managed by state and county agencies. In California, the California Air Resources Board determines if burning is allowed on a daily basis. County Air Pollution Control Districts are responsible for issuing burn permits and enforcing state regulations.

The Nevada Division of Environmental Protection regulates burning in Douglas County. Northern Nevada Public Health regulates burning in Washoe County.

California Department of Forestry and Fire Protection (CAL FIRE)

CAL FIRE is responsible for enforcing the Z'Berg-Nejedly California Forest Practice Act of 1973 on non-Federal timberlands in California. CAL FIRE is also responsible for providing input and/or enforcing pre-development fire protection stands (PRC §4290), performing and enforcing defensible space law (PRC §4291), and the California Wildland Urban Interface Building Code.

In addition, CAL FIRE works with other internal programs, such as the California Office of the State Fire Marshal, California State Board of Forestry and Fire Protection, and CAL FIRE's Fire and Resource Assessment Program. The California Office of the State Fire Marshal is also part of CAL FIRE. The

mission of the State Fire Marshal is to protect life and property through the development and application of fire prevention engineering (such as the Wildland Urban Interface Building Standards), education, and enforcement. The California State Board of Forestry and Fire Protection's mission is to provide policy leadership and to generate public interest and support in those matters key to the future of the State's forest and rangelands, including but not limited to PRC §4291, the California Forest Practice Act, and PRC §4290. The California Department of Forestry and Fire Protection's Fire and Resource Assessment Program assesses the amount and extent of California's forests and rangelands, analyzes their conditions, and identifies alternative management and policy guidelines.

Nevada Division of Forestry (NDF)

NDF is responsible for enforcing the Nevada Forest Practice Act, regulating prescribed fires, and enforcing regulations on state protected plant species on private and state land. These regulations ensure that commercial logging operations associated with forest management and fuels reduction activities follow best management practices and limit erosion by complying with regulations found within NRS and NAC 527 and NRS and NAC 528.

Nevada Department of Environmental Protection (NDEP)

The NDEP administers statutes and implements rules and regulations intended to maintain the quality of the water resources of Nevada. Regarding forest management and fuels reduction activities, the protection of the quality of waters of the state is accomplished in coordination with the Nevada Division of Forestry and other state and local agencies as specified in the Nevada Forest Practice Act, NRS 528.010 to .090, and in the Diffuse Sources section of NAC 445A.305 to 445A.340. These regulations generally specify and limit activities nearby water bodies and require use of best practices and erosion control methods to prevent significant degradation of water quality. NDEP also issues air quality permits for prescribed fire activities in the Nevada portion of the Basin.

Section 11: Conclusions

Implementing the Strategy has cost $125,227,734 with an annual average expenditure of $20,871,288 per year. Treating the remaining project areas is projected to cost between $198 million and $216 million, with an additional $35 million to $48 million anticipated to begin phased treatments on previously treated areas to maintain fire behavior modification efficacy over the next 10 years. Sustained investment is required to ensure that these living ecosystems are managed for sustained benefits, including reducing wildfire risk and mitigating wildfire impacts. The Federal, state and local program managers continue to treat the remaining project areas and maintain the significant investments of time and money that have been completed to ensure community protection is realized into the future.

One key concern to continued progress is the removal of the fuels that are treated. With limited opportunities for biomass utilization due to access constraints, and facilities to utilize the material, increased use of prescribed fire will continue to present challenges. There are limited options to dispose of forest debris generated from forest projects. Both due to difficulty in accessing project forest debris and facilities that utilize biomass as fuel are limited. Prescribed burning will continue to be a necessary tool for fuel reduction and maintenance treatments.

While this Strategy proposes continuing fuel reduction treatments in and around communities throughout the Basin, one key to its success is the simultaneous development of defensible space around private residences, buildings, and the general infrastructure of the area. Participating agencies and organizations have facilitated this through an active education and enforcement campaign and recognize that additional emphasis needs to be placed on these activities to ensure success.

The partners to this Strategy recognize that collaboration on several key focus areas should continue to ensure this Strategy's success. These focus areas include:

- Identifying pathways for regulatory collaboration in areas such as air quality, stream environment zones, limited operating periods, and watershed protection.
- Developing strategies to reduce planning and implementation costs associated with access issues and the use of innovative treatment techniques.
- Facilitating partnerships with potential biomass end-users.
- Developing and maintaining adequate staff and a contractor resource pool to implement the proposed projects.
- Identifying efficient mechanisms to implement projects over multiple jurisdictions.

Finally, this Strategy will only be as successful as the continued commitment of each participating agency. This continuing commitment—to coordinate, communicate, and collaborate with each other and the people they serve—will result in responsive and cost-effective wildfire prevention that ultimately will protect the people and values at risk treasured in the Lake Tahoe Basin.

Federal, state, and local land managers, and Lake Tahoe fire agencies, continue to meet annually to review the results of the prior year fuels reduction efforts and identify fuels reduction projects and priorities, within the scope of this Strategy, for the upcoming year. Future projects identified by this group will meet the intent of this Strategy and meet the intent of all the underlying implementation plans including the community wildfire protection plans for the Lake Tahoe Basin. Projects will be prioritized for funding consistent with this Strategy and current direction and intent. Where projects cross jurisdictional boundaries, the group will collaborate on implementing the project with the goal of reducing environmental compliance, permitting, and contracting costs.

References

Anderson, H.E. 1982. Aids to determining fuel models for estimating fire behavior. General Technical Report INT-122, USDA Forest Service, Intermountain Forest and Range Experiment Station, Ogden, UT. 22p.

Benda, L.E. 2003. The role of fire and punctuated sediment and wood supplies on channel and valley morphologies and aquatic habitats. Forest Ecology and Management 178(2003): 183–196.

C.G. Celio & Sons; Steve Holl Consulting; Wildland Rx. 2004. Community wildfire protection plans for the California portion of the Lake Tahoe Basin. Prepared for the Tahoe Basin Fire Safe Council; South Lake Tahoe, CA.

California Tahoe Conservancy. 2013. A regional greenhouse gas inventory for the Lake Tahoe Basin. Final Report STI-911006-5371-FR, South Lake Tahoe, CA.

Healthy Forest Initiative. 2002. Available at: http://www.fs.fed.us/projects/hfi/background.shtml

Healthy Forests Restoration Act. 2003. Available at: http://www.fs.fed.us/projects/hfi/background.shtml

Holl, S. 2007. Fuel reduction and forest restoration plan for the Lake Tahoe Basin Wildland Urban Interface. Steve Holl Consulting, Folsom, CA. http://www.trpa.org/

Huff, M.H.; Ottmar, R.D.; Alvarado, E.; [and others]. 1995. Historical and current forest landscapes in eastern Oregon and Washington Part II: Linking vegetation characteristics to potential fire behavior and related smoke production. General Technical Report PNW-GTR-355, USDA Forest Service, Pacific Northwest Research Station, Portland, OR. 43 p. [Everett, R.L., team leader; Eastside forest ecosystem health assessment; Hessburg, Paul F., science team leader and tech. ed., Volume III: assessment.)

Lindstrom, S.; Rucks, P.; Wigand, P. 2000. A contextual overview of human land use and environmental conditions. *In:* Lake Tahoe Watershed Assessment: Volume 1; D.D. Murphy and C.M. Knopp, editors. USDA Forest Service, Pacific Southwest Research Station, Albany, CA.

McMahon, T.E.; DeCalesta, D.S. 1990. Effects of fire on fish and wildlife. *In:* Walstad, S.R.; [and others]; editors. Natural and prescribed fire in Pacific Northwest Forests. Oregon State University Press, Corvallis.

Nabuurs, G.J.; Masera, O.; Andrasko, K.; [and others]. 2007. Forestry. (Pages 541□584) *In:* Climate Change 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [B. Metz, O.R. Davidson, P.R. Bosch, R. Dave, L.A. Meyer; editors], Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. http://www.ipcc.ch/publications_and_data/publications_ipcc_fourth_assessment_report_wg3_report_mitigation_of_climate_change.htm

Pyrlogix. 2024. Methods and outputs of the Wildfire Exposure Simulation Tool (WildEST). https://www.pyrologix.com/reports/WildEST%20Documentation.pdf

Rieman, B.E.; Lee, D.; Burns, D.; [and others]. 2003. Status of native fishes in the Western United

States and issues for fire and fuels management. Forest Ecology and Management 178(1-2): 19-212.

Reinhardt, E.; Holsinger, L. 2010. Effects of fuel treatments on carbon-disturbance relationships in forests of the northern Rocky Mountains. Forest Ecology and Management doi:10.1016/j.foreco.2010.01.015. http://www.firelab.org/FFSTeam_Files/Reinhardt_Holsinger_10_ForEcolMgmt_Effects.pdf

Resource Concepts, Inc. 2004a. North Tahoe community wildfire risk/hazard assessment. Prepared for the Nevada Fire Safe Council; Carson City.

Resource Concepts, Inc. 2004b. Tahoe-Douglas community wildfire risk/hazard assessment. Prepared for the Nevada Fire Safe Council; Carson City.

Rothermel, R.C. 1983. How to predict the spread and intensity of forest and range fires. General Technical Report INT-143, USDA Forest Service, Intermountain Range and Experiment Station, Ogden, UT. 161 p.

Runyan, Dean and Associates, 2009. The economic significance of travel to the North Lake Tahoe area: 2003□2008p detailed visitor impact estimates.

Safford, H.; Schmidt, D. 2007. Historical reference condition mapping, Version 3. Lake Tahoe Basin

Safford, H.D.; van de Water, K.; Schmidt, D. 2011. California fire return interval departure (FRID) map, 2010 version. USDA Forest Service, Pacific Southwest Region and The Nature Conservancy-California [http://www.fs.fed.us/r5/rsl/clearinghouse/r5gis/frid].

Scott, J.H.; Reinhardt, E.D. 2001. Assessing crown fire potential by linking models of surface and crown fire behavior. Research Paper RMRS-RP-29, USDA Forest Service, Rocky Mountain Research Station, Fort Collins, CO. 59 p.

Tahoe Fire and Fuels Team. 2025. Lake Tahoe Basin Community Wildfire Protection Plan. https://www.tahoercd.org/files/df63c18bd/2025+CWPP+20241113_Final_Compressed.pdf

Taylor, A.H. 2004. Identifying forest reference conditions on early cut-over lands, Lake Tahoe Basin, USA. Ecological Applications 14(6): 1903□1920.

Toman, E.; Stidham, M.; McCaffrey, S.; Shindler, B. 2013. Social science at the wildland-urban interface: A compendium of research results to create fire-adapted communities. General Technical Report NRS-111. USDA Forest Service, Northern Research Station, Newtown Square, PA. 75 p.

UC Davis Tahoe Environmental Research Center. 2013. Tahoe state of the lake report 2013. UC Davis TERC, Incline Village, NV [http://tahoe.ucdavis.edu/docs/sotl-reports/2013/sotl2013.pdf].

USDA Forest Service. 1988. Land and resource management plan. Lake Tahoe Basin Management Unit, South Lake Tahoe, CA.

USDA Forest Service. 2000a. Lake Tahoe Basin watershed assessment: Vol. I. General Technical Report PSW-GTR-175, USDA Forest Service, Pacific Southwest Station, Albany, CA.

USDA Forest Service. 2000b. Forest Products Laboratory Research Program on small diameter

material. General Technical Report FPL-GTR-110(rev), USDA Forest Service, Forest Products Laboratory, Madison, WI. 31 p.

USDA Forest Service. 2004. Sierra Nevada Forest plan amendment, final supplemental environmental impact statement. Pacific Southwest Region, Vallejo, CA.

USDA Forest Service. 2006. Protecting people and natural resources: A cohesive fuels treatment strategy. Healthy Forests Initiative, Washington, DC

USDA Forest Service; [and others]. 2007. Lake Tahoe Basin multi-jurisdictional fuel reduction and wildfire prevention strategy. Lake Tahoe Basin Management Unit, South Lake Tahoe, CA.

USDA Forest Service LTBMU. 2013. Revised land and resource management plan. R5-MB-254B, Lake Tahoe Basin Management Unit, South Lake Tahoe, CA.

USDA Forest Service LTBMU. 2013. Final revised land and resource management plan final EIS. R5-MB-254A, Lake Tahoe Basin Management Unit, South Lake Tahoe, CA.

USDI [and others]. 1995. Federal wildland fire policy (and 2001 updates). Available at: http://www.nifc.gov/fire_policy/history/index.htm

USDI and USDA. 2000. Managing the impacts of wildland fires on communities and the environment– A report to the President (also known as the National Fire Plan) http://www.fireplan.gov/resources/annual_report.html

USDI and USDA 2001. A Collaborative approach for reducing wildland fire risk to communities and the environment 10-year comprehensive strategy. Available at: http://www.fireplan.gov/resources/policies.html

USDI and USDA. 2001. Urban wildland interface communities within the vicinity of Federal lands that are at high risk from wildfire. *In: Federal Register* January 4, 2001 of US Archives and Records Administration and available at Bureau of Land Management, Office of External Affairs, National Interagency Fire Center, Boise, ID [https://www.federalregister.gov/articles/2001/01/04/01-52/urban-wildland-interface-communities-within-the-vicinity-of-federal-lands-that-are-at-high-risk-from#addresses].

USDI and USDA 2002. A collaborative approach for reducing wildland fire risk to communities and the environment 10-year comprehensive strategy: implementation plan. Available at: http://www.fireplan.gov/resources/policies.html

Wondzell, S.M.; King J. 2003. Postfire erosional processes in the Pacific Northwest and Rocky Mountain Regions. Forest Ecology and Management 178: 75-87.

Vibrant Planet. 2004. Vibrant Planet Product Guide. https://s3.us-west-2.amazonaws.com/vp-toyon-static-content/20250331/hamburger-menu/Vibrant%20Planet%20Product%20Guide%209.2024.pdf?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=AKIA2R3WRP3FQ5SMI6WZ%2F20250514%2Fus-west-2%2Fs3%2Faws4_request&X-Amz-Date=20250514T170344Z&X-Amz-Expires=3&X-Amz-SignedHeaders=host&X-Amz-Signature=38d1fe8ad59b0c70c37b59b2fefb1e8518e7bb3e13395f2cacd5f20113864f80

Appendix A: Reporting Process-Project Tracking

Purpose

Provide a coordinated, comprehensive, and consistent process to manage project planning, accomplishment, and funding sources for scheduling and reporting needs across all jurisdictions.

Responsibilities

Tahoe Fire and Fuels Team manage spatial data (building data dictionary, metadata), TRPA is responsible for EIP Reporting tool and data calls for annual reporting needs.

Baseline requirements

- Consistent reporting timeframe for updating; annually, in February (data call).
- Reporting should be easy to complete by local units (automated drop-down selections), electronic form or standardized paper form for data input).
- Based on standardized definitions.
- Be compatible/integrated with geospatial data.
- Satisfy majority of reporting needs (congressional reports, annual accomplishments, funding use, etc.).

Definitions

Refer to EIP Performance Measures (PM) Information Sheets.

EIP Performance Measure Subcategories

Treatment Zone

- **General Forest** ~ Areas outside of delineated wildland-urban interface that are available for treatment under the Strategy (does not include wilderness or congressionally designated areas).
- **Defense Zone** ~ Includes EIP identified urban core, because this area was not delineated spatially and EIP identified community defense zone.
- **Threat Zone** ~ Area between the defense zone and general forest.

Treatment Type

- Hand thinning
- Mechanical thinning
- Mastication
- Chipping
- Prescribed burning (includes both pile burning and understory burning)
- Biomass removal
- Pruning

Initial Treatment

These are first entry treatments in high priority areas that exhibit fuels characteristics that would contribute to extreme fire behavior. These treatments may require multiple treatment types to achieve the desired condition.

Post Treatments (Phased)

These treatments occur 5 to 10 or more years after the initial treatments are completed to sustain the efficacy of the initial treatments and typically require lower cost treatments to remove surface fuel accumulations resulting from vegetation growth and fuel accumulations (pine needles, branches, down woody debris, etc.).

Property Ownership

Follow EIP PM Definitions: This provides the best approach to spatially assigning acres treated.

Implementing Agency

The Name of the Unit Managing the Treatment Unit: Using standardized nomenclature. Differentiate when multiple jurisdictions/agencies are involved (i.e., CTC).

EIP Project Name

The unit's name (must be unique) associated with the piece of ground being treated.

Additional Reporting Requirements

Planning/Scheduling

Provide a method of quickly visualizing and reporting where proposed treatments are located and what stage of planning to support coordination of implementation efforts.

- **Future ~** Available for consideration, not currently in priority list. Can be identified for out- year consideration.
- **Planning ~** Projects that are in the planning stages but have not completed all requirements to allow implementation.
- **Planned ~** All environmental compliance and other requirements completed, ready for implementation scheduling.
- **In Progress ~** Layout; contract preparation in progress or scheduled for current year; groundwork started or in progress.
- **Completed ~** Treatment type completed (may not mean all treatments are completed).

Costs

- Define cost components (overhead, planning, and implementation).
- Defensible space costs; in kind costs.
- Costs identified (shares by agency), funding sources.

Greenhouse Gas Emissions

- Annual benefits from treatments.
- Annual benefits from biomass conversion to bioenergy.

Appendix B: Treatment Types

Treatments are methods used to achieve the desired fuel loading conditions described below. Which treatment strategy to use depends upon cost effectiveness, availability of implementation resources, the size and type of vegetation to be removed, and site-specific resource protection needs. The primary treatments used in the Lake Tahoe Basin include (may not apply to every agency):

- Thinning (hand, ground-based mechanical, and aerial-based mechanical)
- Prescribed burning (pile and understory burning)
- Mastication and chipping

Thinning

Mechanical and hand thinning are used to reduce the number of brush and trees, which affects crown fire potential. Mechanical thinning is generally more cost effective than hand thinning for removal of large trees (trees greater than 16 inches diameter), and allows removal of larger trees to achieve spacing objectives. Ground-based mechanical thinning is generally prohibited on slopes more than 50 percent and on sensitive areas, such as stream environment zones. Aerial-based mechanical thinning uses helicopter or cable-based systems to remove trees on slopes greater than 30 percent. Hand thinning is generally limited to the removal of brush and trees less than 16 inches diameter on steeper slopes, and in sensitive areas. Hand thinning may also involve pruning, which removes lower branches on trees, increasing the crown-base height (the distance from surface fuels to tree crowns). Because it is labor-intensive, pruning is generally limited to project areas in the defense zone.

Prescribed Burning

Prescribed burning reduces surface fuels using pile burning or understory burning. Pile burning is used on steep slopes where machines are prohibited and adjacent to developed areas where machines cannot process or otherwise remove material. Understory burning may be used to remove slash created by machine thinning and as an additional treatment in previously treated areas, or to restore forest health and to mimic the historic process of low-intensity fire.

Mastication and Chipping

Mastication and chipping are used to reduce ladder and surface fuels. Masticators consist of a mastication head on the end of an articulated arm that moves through the forest on a tracked or rubber-tired machine or mounted on a small loader-type machine with rubber tracks. Fuels are ground up into irregular-shaped chunks and left on the ground. The irregular-shapes allow air and water to seep between them, hastening decomposition. Chips are created when material is fed into a chipper and either removed from the site as biomass or spread on site. Chipping creates uniform-sized chips that can form an interlocking mat that decomposes very slowly and inhibits regeneration of shrubs and grasses.

United States Department of Agriculture
Forest Service
Lake Tahoe Basin Management Unit
35 College Drive
South Lake Tahoe, CA 96150
530-543-2600
TDD: 530-543-0956

File Code: 1560
Date: May 29, 2025

Washoe Tribe of Nevada and California
Environmental Protection Department
919 U.S. Hwy 395 N
Gardnerville, NV 89410

Dear Rhiana Jones:

The Lake Tahoe Basin Multi-Jurisdictional Fuel Reduction and Wildfire Prevention Strategy was completed and approved in 2007. This comprehensive fuels reduction and wildfire prevention plan is a unified, multi-jurisdictional synopsis of the planning efforts of all Lake Tahoe Basin partners engaged in forest management, fuels reduction, and wildfire prevention efforts. The proposed projects in this plan provide a 10-year strategy to reduce the risk of large and destructive wildfire in the Tahoe Basin.

The original plan's outcomes were to:

1. Propose projects that create "community defensible space".
2. Comprehensively display all proposed fuel reduction treatments.
3. Facilitate communication and cooperation among those responsible for plan implementation.

This strategy has reached its 10-year lifespan and is need of renewal. After 10 years, the priority projects identified within the plan have been active and the initial fuels reduction treatments have been completed. At this time, an update is needed to provide strategic priorities across the Lake Tahoe Basin for the next 10-year period, as well as address maintenance to the originally identified areas and treatments based on wildland urban interface growth and changes.

As one of the intentions of the plan was to facilitate communication and cooperation among entities engaged in forest management and wildfire prevention, this is the opportunity to engage additional partners. Given that the Lake Tahoe Basin is a hugely important cultural landscape within the ancestral homelands of the Washoe Tribe of Nevada and California, the tribe's engagement and partnership is integral to the management of this landscape. Participating entities will be a part of the multi-jurisdictional strategy, project coordination, and may be eligible to apply for funding in these efforts. There is no obligation from cooperating entities, as the Forest Service is the lead agency and no funding from other partners is needed. It is requested that participating entities are engaged in the draft review and also sign a letter of support for the strategy.

For more information on the Southern Nevada Public Lands Management Act, please follow this link: https://www.blm.gov/SNPLMA.

A review of the draft updated strategy is planned for July of 2025. Additional details will be sent out at the date gets closer. If you have questions or concerns, please contact:

Carrie Thaler
Forest Fire Chief
carrie.thaler@usda.gov
530-721-3738

Thank you for your time, and we look forward to working with you!

Sincerely,

ERICK J. WALKER
Forest Supervisor

USDA United States Department of Agriculture | Forest Service | Pacific Southwest Region

Regional Office, R5
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File Code: 1560
Date: July 23, 2025

Jon Raby
Nevada State Director
Bureau of Land Management
1340 Financial Blvd
Reno, Nevada 89502-7147

Dear Mr. Raby:

Enclosed is the updated Lake Tahoe Basin Multi-Jurisdictional Fuel Reduction and Wildfire Prevention Strategy (the Strategy) prepared to comply with the White Pine County Conservation, Recreation, and Development Act of 2006 (public Law 109-432) [H.R. 6111]), which amended the Southern Nevada Public Land Management Act of 1998 (Public Law 105-263). On behalf of the US Forest Service Lake Tahoe Basin Management Unit (LTBMU), I am pleased to approve the Strategy and notify you that it replaces the 2014 Strategy.

In addition since the last update in 2017, we have one partner to add. The Washoe Tribe of Nevada and California has agreed to be a signatory to the Strategy. I approve of this partner as a signatory to the Strategy.

This updated Strategy builds on the lessons learned from the previous updates and amendments, and represents the culmination of several months and long hours of collaboration by 17 federal, state, and local agencies in both Nevada and California. With the addition of the Washoe Tribe, the updated Strategy provides the opportunity to organize hazardous fuels reduction efforts on the private lands and will help us accomplish our goals of fuel treatments occurring on all lands in the Basin in a timely and efficient manner.

If you have any questions about the Strategy, please contact me at (707) 562-9000 or ted.mcarthur@usda.gov.

Sincerely,

×

TED O. MCARTHUR
Acting Deputy Regional Forester

Enclosure
cc: Alan Shepherd, Rob Mobley, Gianna Vaccaro, Erick Walker