



OLYMPIC VALLEY COMMUNITY WILDFIRE PROTECTION PLAN

This Community Wildfire Protection Plan was developed with input from the Olympic Valley Public Service District, Olympic Valley Fire Department, Placer County, CAL FIRE, U.S. Forest Service, Olympic Valley Firewise Community, large landowners and the community to reduce the risk of wildfires in Olympic Valley.

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RESOLUTION 2022-_____

**A RESOLUTION OF THE BOARD OF DIRECTORS OF THE
OLYMPIC VALLEY PUBLIC SERVICE DISTRICT ADOPTING
THE OLYMPIC VALLEY COMMUNITY WILDFIRE PROTECTION PLAN**

WHEREAS, Olympic Valley Fire is a department within Olympic Valley Public Service District which is a public agency located in the County of Placer, State of California, and the Olympic Valley Public Service District is an independent special district, organized under Water Code section 30000, et seq. in 1964; and

WHEREAS, the Board of Directors authorized the development of a Community Wildfire Protection Plan (CWPP); and

WHEREAS, the purpose of the CWPP is to increase wildfire safety for the District’s residents and visitors while reducing the risk of loss of life and property.

NOW, THEREFORE, BE IT RESOLVED that the Board of Directors of the Olympic Valley Public Service District hereby adopts the Olympic Valley Community Wildfire Protection Plan, copy of which is attached hereto.

PASSED AND ADOPTED this 13th day of December 2022 at a regular meeting of the Board of Directors duly called by the following vote:

AYES:

NOES:

ABSENT:

ABSTAIN:

APPROVED:

Dale Cox, Board President

ATTEST:

Jessica Asher, Board Secretary

Signature Page

REVIEWED BY:

PRINTED NAME

SIGNATURE

DATE

Chief, Olympic Valley Fire Department

Chief, CALFIRE Nevada Yuba Placer, Unit

Supervisor, Tahoe National Forest

Chair, Placer County Board of Supervisors

Olympic Valley Firewise Community

GRANT NUMBER 5GG20117
OLYMPIC VALLEY PUBLIC SERVICE DISTRICT
OLYMPIC VALLEY COMMUNITY WILDFIRE PROTECTION PLAN

Funding for this project provided by the California Department of Forestry and Fire Protection’s Fire Prevention Program as part of the California Climate Investments Program.

OLYMPIC VALLEY COMMUNITY WILDFIRE PROTECTION PLAN, is part of California Climate Investments, a statewide program that puts billions of Cap-and-Trade dollars to work reducing GHG emissions, strengthening the economy, and improving public health and the environment—particularly in disadvantaged communities. The Cap-and-Trade program also creates a financial incentive for industries to invest in clean technologies and develop innovative ways to reduce pollution. California Climate Investments projects include affordable housing, renewable energy, public transportation, zero-emission vehicles, environmental restoration, more sustainable agriculture, recycling, and much more. At least 35 percent of these investments are located within and benefiting residents of disadvantaged communities, low-income communities, and low-income households across California. For more information, visit the California Climate Investments website at:

www.caclimateinvestments.ca.gov.



DISCLAIMER: This document analyzes wildfire hazard across the Olympic Valley area and makes recommendations on ways that residents in the area can reduce their collective exposure to wildfire-caused losses.

Within this document, areas were prioritized for hazard reduction based upon a number of factors including: potential wildfire behavior, density of homes, proximity to wildland vegetation, and prevailing fire-season weather and winds. The fact that an area may be mapped as lower priority in this document does NOT mean that that particular area is safe from wildfires—rather, it just means that there were other areas where targeted wildfire hazard reduction projects or public education might benefit a greater number of residents.

Under typical summer wildfire burning conditions, any area with tall dead grass or un-mowed weeds has the potential to support rapid rates of wildfire spread and high intensity burning. There are NO low-priority areas for annual weed abatement or fire hazard mitigation in the Olympic Valley area.

Wildfire behavior is the product of numerous factors, some of which are weather-dependent and difficult or impossible to quantify. The suggestions in this assessment are based upon field surveys, technical analysis, and the professional experience of the authors. Errors may exist in this analysis and could include improper recording of field data due to GPS accuracy or surveyor error, computational errors, data entry mistakes and any other conceivable cause. This data comprises a simplification of the physical environment intended to allow the authors to make general recommendations about reducing potential fire behavior at the community scale.

While this data is useful in assessing relative risk between the many micro-climates and vegetation-types present in the Olympic Valley area, site-specific changes in fuel hazard and wildfire risk (such as annual mowing, grazing, and weed clearance, the growth of flammable ornamental plants and native vegetation, and other changes in the physical environment) will quickly render this data inaccurate.

THIS DATA DESCRIBES VEGETATION AND WILDFIRE HAZARD CONDITIONS IN THE OLYMPIC VALLEY AREA AT A SINGLE POINT OF TIME, SUMMER 2022. ANY FUTURE USE OF THIS DATA FOR OTHER PLANNING, CODE ENFORCEMENT, OR HAZARD MITIGATION WORK IS NOT RECOMMENDED WITHOUT FIRST CHECKING PHYSICAL CONDITIONS ON THE GROUND.

Chapter 1: Executive Summary

The goal of this Community Wildfire Protection Plan (CWPP) is to aid stakeholders in:

- Developing and implementing effective, tactically-useful hazardous fuel treatment projects.
- Prioritizing areas for fuel reduction and wildfire-related code enforcement.
- Increasing the wildfire literacy of community members.
- Assisting public agencies in making valid and timely decisions for wildfires and evacuations.
- Estimating the hazards associated with wildland fire in proximity to the community. The hazard information, in conjunction with values-at-risk information, defines “areas of concern” for the community and allows prioritization of mitigation efforts.
- Providing community members with information on how best to reduce their exposure to wildfire losses.

This most important parts of this document are the maps and project lists. The text is intended to provide background on “bigger-picture” issues affecting fire hazard and exposure of the community to wildfire losses.

The Olympic Valley Community Wildfire Protection Plan was developed following some of the most destructive wildfires in California’s recorded history. Five of the six largest fires in modern California history occurred within the past five years. When these fires have entered areas with inadequate separation between wildland vegetation and structures, massive property losses have occurred, and many people have died.

Site visits in 2021, and in the spring and fall of 2022, and aerial LiDAR data from 2021 were used to analyze existing wildfire hazard conditions within the Olympic Valley. About 20% of lots smaller than one acre within the Olympic Valley Public Service District had heavy loadings of ladder fuels, with about 35% showing moderate levels of ladder fuels. The 2021 LiDAR data shows that over 50% of all lots under one acre had some level of ladder fuels present. Ladder fuels are a concern, because they can carry a surface fire into the canopy above. The LiDAR mapping information is shown in greater detail in maps later in this document (Figures 4-7).

The LiDAR surveys and 2022 site visits mapped high wildfire hazard conditions in many areas within the Olympic Valley community. Reducing vegetative fuels *within* the community and adjacent to major travel ways, and hardening structures against wildfire should be the highest priority of all wildfire hazard mitigation work. Larger-scale fuelbreak-type forestry projects not adjacent to major travel routes should be considered a secondary priority to work within the neighborhoods. Due to close proximity of structures in the built-up areas of the community, reducing fuels within 100’ of all structures will effectively treat the entirety of every lot, dramatically reducing wildfire threats withing the core of the community.



Figure 1: Heavy wildfire fuels adjacent to a structure

The Olympic Valley Fire Department appears to be enforcing a fairly narrow interpretation of California Public Resources Code 4291, which is their primary legal mechanism for ensuring wildfire safety on private lots. Specifically, there are many areas of thickets of small conifer trees on private lots throughout the community. The CWPP project team recommends the OVFD enforce PRC 4291 to the full 100' buffer from each structure with an emphasis on removing small, dense trees and ladder fuels, even if they are not within 30 feet of a house.

The highest-priority wildfire hazard mitigation projects for Olympic Valley are to reduce fuels and maintain low-flammability conditions around structures. This and other mitigation strategies, including reducing structure ignitability, providing public education measures, improving road access for emergency response and evacuation, reducing forest density across large areas adjacent to assets at risk, improving water supply and water delivery infrastructure, and improving communication and warnings in the event of a fire. A list of other potential projects for the future is also provided.

Chapter 2: Community Description

Olympic Valley Community Description

Olympic Valley is an unincorporated community located in Placer County, California, west of State Route 89 and the Truckee River, and north of Lake Tahoe along Washeshu Creek. The community gained worldwide prominence when the 1960 Winter Olympics were held here. The high elevation and steep topography make the area a perfect site for alpine sports and the valley floor and lower slopes are prime locations for commercial structures, homes, a golf course and parking areas for the Palisades Tahoe ski resort.

Palisades Tahoe is located largely on the south and west side of the valley. The year-round facility provides opportunities for winter sports and summer activities. The base elevation is 6,200 feet and the peak elevation is 9,050 feet, predominantly on a north aspect.

The Olympic Valley Public Service District serves a population of approximately 924 year-round residents, with a maximum overnight population of approximately 6,500. Both resident and visiting populations are housed in approximately 663 residential units, 1,180 condominiums, and approximately 20 commercial entities consisting of private residences, ski resorts, hotels and supporting businesses. (*Olympic Valley Public Service District Annex O-4 Local Hazard Mitigation Plan Update*, June 2021).

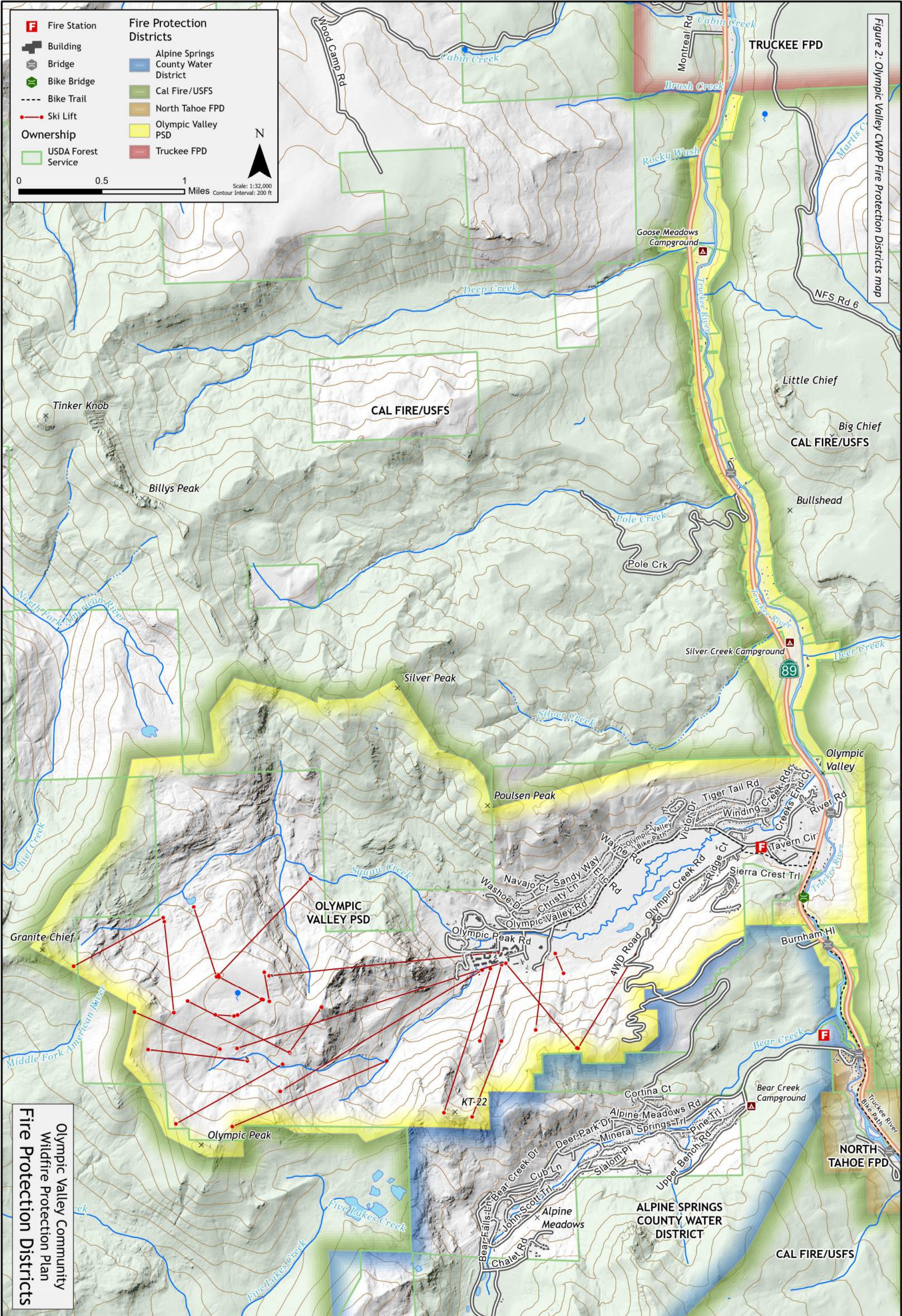
This population is expected to increase significantly due to projected development. Furthermore, the 2016 LAFCO Municipal Service Review estimates that 89% of all single-family homes, condominiums and timeshares in Olympic Valley are not owner-occupied. Absentee landlords are often less likely to be aware of hazardous wildfire fuel accumulations, and maybe be unenthused about paying significant sums of money to maintain the vegetation on their entire lot. These factors may increase the challenge of defensible space enforcement.

The Sierra Nevada mixed conifer forests adjacent to Olympic Valley are dominated by ponderosa pine and white fir, with some incense cedar. There is no large fire history within 10 miles of the project area in the past 60 years, and there has been fairly minimal forest management in most of the area in the past 50 years. These factors have led to unhealthy levels of forest density. Drought conditions of the past 15 years have placed additional stress on the forests, and many of the fir trees in the area are currently dying from bark beetle attacks.

Several wildfire scenarios could deliver a large fire to the area. North and east winds generally arrive in the late fall and are very dry. These could carry a fire starting in North Lake Tahoe or the Truckee area toward the community. Another scenario is a fire starting on the west side of the Sierra Crest burning across the divide and into the community from the west. While the relatively sparse vegetation in the high country to the west of Olympic Valley has generally been looked at as a reliable fuelbreak in the past, the nearby 2021 Caldor Fire showed it is possible for drought-driven wildfires to traverse the Sierra Nevada Mountains. Climate change is redefining the experts' understanding of what it is possible for wildfires, and the past is a poor predictor of future conditions or scenarios. Both the 2021 Caldor and Dixie Fires demonstrated the inability of firefighters to stop major fuel-driven wildfires until weather or fuel conditions changed. Due to poor access and a lack of tactical opportunities to control them in the backcountry, any large wildfires burning in the forests adjacent to Olympic Valley are likely to be fought at the edge of the community, where they are accessible.

The Fire Protection Districts map on the following page (Figure 2) shows the jurisdiction of the Olympic Valley Public Service District/Fire Department and neighboring districts. The CWPP area for the Olympic Valley community follows their Fire Protection Boundary. The Truckee River area to the east contains some structures, but development is generally more scattered than in the Olympic Valley. It is the primary evacuation route for many Tahoe-area communities including Olympic Valley. In the west, Palisades Tahoe consists of many barren rock areas. The north section of the valley includes older structures and narrow streets on a primarily south-facing slope. The south section has a north-facing slope and some ski trails, plus most of the community's newer structures, conference centers and resort buildings. There are wider modern streets in the south part of the valley.

Figure 2: Olympic Valley CWPP Fire Protection Districts map



Olympic Valley Community
Wildfire Protection Plan
Fire Protection Districts

Fire Protection

The Olympic Valley Fire Department (OVFD) serves a 9.9 square-mile area including the Olympic Valley and the Truckee River Corridor between Alpine Meadows Road and Cabin Creek Road (approximately 2.5 miles south of Truckee). The fire department serves about 1,000 full-time residents and employees. The area is one of the largest and most popular winter destinations in the world and during winter holiday periods, the population can swell to over 25,000 people.

The department currently has a full-time paid staff of 13 and maintains a minimum staffing of three people, 24 hours per day, seven days per week. In addition to full-time staff, they have paid part-timer employees who augment staffing during busy periods. A detailed description of OVFD capabilities is in Appendix F and https://www.ovpsd.org/sites/default/files/documents/Your_OVFD.pdf

Wildfires in the Olympic Valley area are responded to by the OVFD, with mutual aid from CAL FIRE, the U.S. Forest Service, and other local agencies. Capabilities of local CAL FIRE and USFS firefighting resources is also covered in Appendix F.

Community Meetings

Two community meetings were held, first with Olympic Valley stakeholders on July 3, 2021 and with the broader community on October 2, 2021, to explain the need for a CWPP, discuss fire behavior and to give opportunities for the public to provide input.

Community input included:

- Expanding project areas and prioritizing more projects for future work.
- Working with local ski patrol to examine how avalanche and mudslide areas may be impacted by tree thinning. Discussions were requested for additional planning that would be done prior to thinning to ensure conditions are not worsened due to fuels management. (Major thinning is not recommended in any designated avalanche zones.)
- The Truckee River corridor is an important evacuation zone for the entire North Lake Tahoe Area. The community would like to put pressure on the U.S. Forest Service to expand roadside hazard and safety work in the corridor.
- Including a project to thin an additional 100'-150' community buffer beyond individual property owner boundaries.
- Green waste collection within the valley and the proposal of an annual communal green/yard waste collection window.

Chapter 3: Fire Risk & Fire Behavior

Located in the middle of tens of thousands of acres of wildland, with hundreds of wooden homes and commercial structures, **the Olympic Valley community has a very high exposure to catastrophic wildfire losses**. A primary objective of this CWPP is to help identify key tactical locations where wildfire hazard reduction expenditures will have the greatest impact or tactical value. Toward that end, the CWPP project team used mapping and modeling tools to assess relative wildfire risks across and adjacent to the community. This section provides background on the assessment process.

Wildland Fire Behavior Modeling and LiDAR

The wildland fire behavior analysis developed for the CWPP was designed to meet two objectives:

1. Examine the existing fire hazard and potential losses in the event of a wildfire
2. Establish the best treatment locations and priority for those treatments based on expected fire behavior with input from the firefighting agencies and local community members

For a detailed look at the density of small trees, shrubs, and other 'ladder fuels' adjacent to structures, this assessment used aerially-collected data from a 2021 Town of Truckee LiDAR acquisition. LiDAR uses laser scanning from airplanes to generate high-detail 3D visualizations of vegetation and the built environment. The project team analyzed the LiDAR data to show areas where low-hanging branches or thickets of small trees have the potential to act as 'ladder fuels', carrying a fire burning on the surface up into the tree crowns. The LiDAR data was field confirmed by Zeke Lunder with site visits on June 28, 2022 and October 20, 2022.

The higher the LiDAR score in the following maps (Figures 4-7), the more likely a structure needs thinning work adjacent to it to reduce hazardous fuels. It should be noted that the LiDAR cannot be used to differentiate between lower-flammability hardwoods such as aspen or lilac and higher-hazard manzanita or conifer saplings. Regardless, the attached LiDAR maps should be used to target priority areas for code enforcement and defensible space thinning.

The picture below (Figure 3) shows ladder fuels. These may lead to tree torching, which occurs when a fire jumps into the crowns of the taller trees. Torching is referred to as “problem fire behavior,” as it is usually accompanied by long-range spotting, which spreads the fire over control lines. Spotting is the primary reason firefighters were unable to corral major fires such as the Caldor or Dixie in 2021.



Figure 3: Thick roadside fuels within the Olympic Valley community.

The “wall-to-wall” LiDAR map (Figure 4) displays the density of points within each cell where there is low vegetation within 6 feet off the ground. It provides a generalization of places where a fire burning on the surface could transition into the crowns of the larger trees.

Weather Patterns

Fire potential is nearly year-round. Most precipitation occurs during the winter months, typically between November and April. During the past several years the area has been under severe drought with very low rainfall and snow totals, exacerbating fire conditions. Even in non-drought years the amount of precipitation can be very low, with El Niño weather years producing much higher precipitation than normal.

The Olympic Valley is characterized by mild summers and cool, wet winters, with an average high temperature in July of 82 and 42 in January. Annual Snow-Water Equivalent Precipitation at the Palisades Tahoe SNOTEL station for water years 2016-2021 was an average of 175 inches. At the 1810 Fire Station Rain Gage on the valley floor, the measurement for the same years was 63 inches. (*Olympic Valley Groundwater Management Plan Six Year Review and Report*, McGinley & Associates, 2022). The majority of precipitation occurs as snowfall during the winter months. A relatively small amount of precipitation occurs as rain during the spring and summer months.

Summertime precipitation occurs in the form of afternoon thunderstorms, which often bring dry lightning and very little rain. High temperatures, dry vegetation, low relative humidity and windy weather results in an increased number of ignitions. Any fire has the potential to quickly become a large, out-of-control fire.

Chapter 4: Wildland Urban Interface and Site Visit Photos

The Olympic Valley is a premier, outdoor activity destination. The community is surrounded by wilderness and forests, lending to its charm and feeling of remoteness. The same qualities that make the area desirable to live or visit also designate the Olympic Valley as a prime example of a busy community situated within the wildland urban interface.

Defining the Wildland Urban Interface

The wildland urban interface (WUI) is the area of land extending out from the edge of developed private land into undeveloped federal, private, and state jurisdictions. The WUI is generally comprised of two zones: the defense zone and the threat zone.

Defense Zone

Defense zones generally extend 1/4 mile out from developed areas, however there is flexibility in national, regional and forest policy to extend or contract actual defense zone boundaries based upon site-specific conditions. For this project, wildfire management specialists and the CWPP project forester determined the extent, treatment orientation and prescriptions for the WUI based on historical fire spread and intensity, historical weather patterns, topography and access. Recommendations exceed the requirements specified by Public Resource Code 4291 due to the prolonged drought, fuel conditions and recent fire history. Defense zones should include sufficient fuel treatments within them to reduce fire spread and intensity enough to allow for suppression efforts to succeed.

Desired Defense Zone Conditions:

- Stands in defense zones are open and dominated primarily by larger, fire tolerant trees.
- Surface and ladder fuel conditions are such that crown fire ignition is highly unlikely.
- The openness and discontinuity of crown fuels, both horizontally and vertically, result in very low probability of sustained crown fire.

Threat Zone

The threat zone typically buffers the defense zone and may be delineated in the absence of a defense zone under certain conditions such as where the structure density and location do not provide a reasonable opportunity for direct suppression on public land. Threat zones generally extend 1.25 miles out from the defense zone boundary, subject to the same conditions that designate defense zones. Fuels treatments in these zones are designed to reduce wildfire spread and intensity. Strategic landscape features, such as roads, changes in fuel types and topography may be used in delineating the physical boundary of the threat zone.

Desired Threat Zone Conditions:

Under severe fire weather conditions, wildland fire behavior in treated areas within the threat zone should:

- Keep flame lengths at the head of the fire to less than four feet.
- Control the rate of spread at the head of the fire to at least 50 percent of pre-treatment levels.
- Reduce hazards to firefighters by reducing number of snags (standing dead trees) adjacent to locations likely to be used for control of prescribed fire and fire suppression.
- Allow production rates for fire line construction to double from pre-treatment levels (remove dead logs along tactically important corridors like potential fireline locations).
- Reduce tree density to a level consistent with the site's ability to sustain forest health during drought conditions.

Registered Professional Forester Jeff Dowling recommends the following specifications/prescriptions for forest-health and wildfire-resilience forestry projects treatments:

- In light of the long-range spotting of fires in similar forest types in past several years, when evaluating the need for hazardous fuel reduction forestry projects, the customary .25-mile defense and 1.25-mile threat zones should be increased to 1 mile and 2 miles, respectively.
- Forest stands in defense zones should be open and dominated primarily by larger, fire tolerant trees.
- Surface and ladder fuel conditions should be maintained in conditions which make crown fire ignition highly unlikely. This can be achieved by removing small trees and using prescribed burning to remove accumulations of dead material.
- The openness and discontinuity of crown fuels, both horizontally and vertically, results in very low probability of sustained crown fire.
- Move the project area toward forest conditions which were present before the Gold Rush related to stand density, tree size class, and species composition that provides for healthy forest conditions resilient to disturbance such as fire, insects and disease, and drought, thereby decreasing the risk for widespread tree mortality during drought conditions. Historic, fire-adapted conditions are open to interpretation. A basal area standard of 75 square feet for tree stocking is necessary to lower crown bulk density and increase crown base height. Where stand conditions allow, a quadratic mean diameter of at least 16 inches should accomplish this goal.
- Improve forest health by thinning trees in areas where densities are high, leading to decreased potential for insect infestation, spreading of diseases, and density-dependent mortality. Improve forest health to increase the stability of the forest carbon sink (i.e., less potential for loss to catastrophic wildfire, insects/disease, density-dependent mortality), and quality of the carbon sink (i.e., more carbon in live versus dead pools, increasing sequestration rates due to healthy growing conditions versus decreasing sequestration rates due to intense competition).

- Continuous brush fields require mastication to create a mosaic of one-acre openings between groups of plants. Discontinuity in the fuels can be achieved while providing travel corridors for species that use these sites.
- Trees less than 6 inches in diameter at breast height (DBH) should be made horizontally and vertically disconnected from surrounding overstory vegetation. Depending upon the site, trees less than 18 inches DBH should have crown base height of 20 feet and crown spacing of at least 10 feet. All larger diameters need to be well spaced as stated above.

With proper treatment, zones within the Olympic Valley can meet these conditions. Prescribed fire and mastication would reduce surface fuels to 1.5 tons per acre (forested area) or lower and tree stockings would be between 50-75 feet squared of basal area. The shrub component would be two tons per acre of live fuel and total fuel load (live and dead) would be 3.5 tons per acre on average. These conditions are suggested and may be difficult to obtain without adding fire back into the ecosystem.

[Site Visit Photos](#)

The following photos were taken within the community of Olympic Valley in early summer 2022. Snow had recently melted and the site visit took place after a dry winter with some late season precipitation. Wildfire hazards are very high across the community. Without focused code enforcement and a major community effort to reduce hazards across the entire community, major wildfire losses are inevitable.

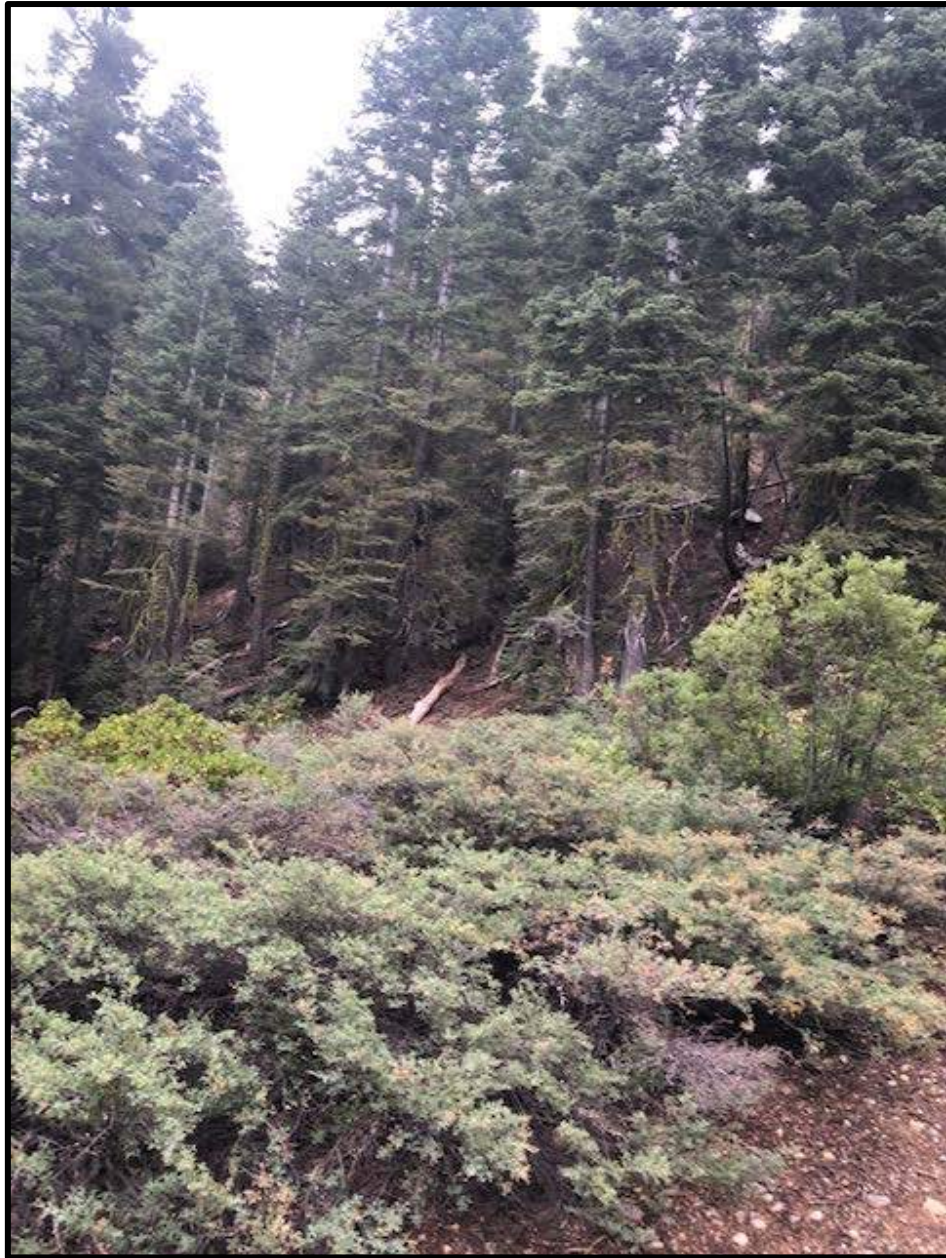


Figure 8: Brush and overstocked timber with a canopy height of less than one foot. Torching fire is likely. Trees under 6" diameter should be removed. Branches should be limbed to 6-8 feet.



Figure 9: Willow, manzanita and pine seedlings. Low fuels can cause torching into larger trees. Dead material should be removed from the willow. Trees under 6" diameter should be removed.



Figure 10: Heavy white fir growth. White fir retains lower limbs providing a fuel ladder that allows flames to climb up to the canopy. Limbing-up white fir is recommended on medium to large diameter trees. White fir under 6" diameter should be removed to eliminate ladder fuel.



Figure 11: Manzanita is present throughout the project area. While not necessarily a fuels problem, dead material should be removed from large manzanita brush and the continuity of brush should be reduced to prevent fire spread. Trees under 6" diameter should be removed.



Figure 12: Heavy lodgepole seedlings on slope should be thinned.



Figure 13: Pine thickets create a torching hazard adjacent to major infrastructure. This is not only a fire danger, but provides a bad example to the rest of community. This area should be heavily thinned within 150 feet of the buildings.



Figure 14: Dense fuels directly adjacent to the conference center creates impression that this is a desired condition. Most small conifer trees here should be removed and larger trees pruned. Aspen trees generally have a lower hazard of ignition, especially when conifers have been removed, and should be promoted as a preferred landscaping tree.



Figure 15: Dense vegetation growing right up against a wood-shingled house. Structure ignition hazard reduction techniques should be a major emphasis of education programs.



Figure 16: Heavy ladder fuels in this neighborhood. Pine needle litter is susceptible to ember ignition and can facilitate fire spread.



Figure 17: High hazard lodgepole thicket directly adjacent to the only road in and out of community. Lodgepole should be heavily thinned to remove ladder fuels.

Chapter 5: Fire Risk Mitigation Strategies and Problem Areas

There are several ways in which the Olympic Valley community can mitigate fire risk. These project suggestions are general in nature and applicable to all current conditions in the Olympic Valley.

- Reducing hazardous fuels around homes and structures
- Reducing structure ignitability
- Providing public education measures
- Improving road access for emergency response and evacuation
- Reducing forest density across large areas adjacent to assets at risk
- Improving water supply and water delivery infrastructure
- Improving communication and warnings in the event of a fire

Reducing Hazardous Fuels Around Homes and Structures

The highest-priority project in Olympic Valley is to reduce fuels and maintain low-flammability conditions around structures. This needs to happen on an annual basis, as grass and other annual plants can carry fire quickly across areas that are otherwise well-maintained.

A single home or series of structures with accumulated fuels can pose a major threat to the entire community. Structures are fuel, as demonstrated by fire jumping from house to house in recent large wildfires. A community is only as strong as its weakest lot and they must all be maintained to a high standard. Preventing a single structure from igniting during a wildfire is a tall order.

Follow-up treatments are crucial to maintaining fire-resilient conditions and it is important to note that this work is never “finished.” Some vegetation requires more frequent re-entry intervals to stay healthy compared to others. For example, pine trees reseed into disturbed areas, or in areas where there is ample sunlight, so forest thinning projects can actually stimulate large crops of pine seedlings. These are most easily managed when they are very small and can be grubbed with hand tools or masticated. Once the same trees are 20 feet tall, removal and disposal become much more difficult.

Since all residential areas in Olympic Valley are in areas designated by CAL FIRE as having Very High potential fire severity, private property owners are legally required to maintain their lots to comply with Public Resource Code 4291, mirrored in Placer County’s Hazardous Vegetation and Combustible Material Ordinance (<https://www.placer.ca.gov/6561/Hazardous-Vegetation>). Parcels in the Olympic Valley are small enough that treating the 100 feet required under PRC 4291 will result in effectively treating the entire residential area. Vegetation management standards are defined on the OVPSD website, and in the checklist, below.

During our 2022 site visit, we observed a large number of residential and commercial parcels with elevated wildfire hazards. It appears from our surveys that OVFD is enforcing a narrow interpretation of PRC 4291 which focuses on vegetation directly adjacent to the structure. However, structure losses during wildfires are driven by embers, not by direct flame impingement. Removing thickets of small trees throughout the community will reduce the number of embers in play if a wind-driven fire pushes into the community.

We recommend code enforcement begin with the high-priority parcels mapped with LiDAR for this plan. The CWPP project team received feedback that a short summer season makes it difficult to inspect, issue warnings and then check compliance before the season ends. If possible, LE-100 inspections and survey work should begin in the fall of each year so notices of non-compliance can be mailed as soon as the snow melts. Lots can then be re-inspected, citations issued, and if necessary, abatement work can be performed by a contractor with billing sent to property-owner per County Code Part 4, 9.32.200-9.32.210.

The OVPSD should secure a contractor early in the year to be ready to execute fuel reduction on the highest priority non-complying parcels as soon as the required amount of notice has passed. We recommend seeking grant funding to finance contractors to do abatement work on non-compliant properties, with the stipulation that recovered funds—through liens, if necessary—are put back into the OVPSD’s fire hazard reduction budget and used to fund other projects listed in this document.

Enforcement of policies, codes and ordinances can have an important impact on risk. For example, the extension of defensible space provisions from 30 feet to 100 feet from a structure had a positive effect that was triggered in part by new requirements of insurance companies.

Enforcement within the Tahoe-area communities of Placer County takes place at the local level, so the Olympic Valley Fire Department is responsible for inspections and enforcement of county ordinances. The code compliance department for Placer County’s Tahoe-area communities indicates that stricter ordinances can be put in place by local agencies. They typically see this with HOAs.

Consistently mentioned in the community survey was the concern of overgrown and un-managed vegetation on vacant lots owned by absentee landowners. Determining the locations of these lots and taking action to get them cleaned up is of great importance to many local community members.

If the OVPSD is not already using digital mapping tools/survey apps to manage LE-100 inspections and defensible space compliance, they should develop these capabilities.

Defensible Space Self-Inspection Checklist

- Make street address visible from the street, contrast with the background and a minimum of 5" in height
- Annual grasses and weeds need to be mowed to 4 inches or less **100 feet** from house or to property line
- Remove pine needles, thin brush and other flammable vegetation **100 feet** from house or to property line
- Maintain the roof of any structure free of pine needles, leaves, or any other dead/dying debris
- Cut grasses, thin brush and other flammable vegetation to **100 feet** from house or to property line
- Clear debris – slash and needle piles, construction debris and flammable storage from around structure
- Clear vegetation to mineral soil around firewood storage piles
- Remove brush, limbs, grass, needles and debris ten feet in all directions from around propane tank
- Limb trees up a minimum of 6 feet from the ground
- Remove dead tree limbs adjacent to or overhanging any structure or decks
- Remove all portions of trees within ten feet from chimneys and/or stovepipe outlets
- Remove all dead and dying trees from the property
- Install a 1/8-inch mesh screen spark arrester on chimneys, stovepipes, and appliances that burn solid fuels
- Maintain defensible space a minimum of 10 feet from the shoulder of the roadway
- Remove any hazardous vegetation constituting an extreme fire hazard, as determined by the code official

Source: OVPSD Website, 2022 - <https://www.ovpsd.org/ovfd/defensible-space>

Recommended Improvements to California Public Resources Code 4291

PRC 4291 makes recommendations that are a *minimal* requirement. Those minimal requirements are up to the interpretation of the landowner or the agency tasked with enforcement or inspection. In the aftermath of structure fire loss over the past five years (see *Journal of Fire Ecology* report in next section), consider that when 4291 was conceived, it was meant to keep fire from *leaving* the structure and entering the wildland. The 2006 revision was meant to do the opposite.

We recommend reducing fuels around structures by implementing more strict inspection and enforcement policies than those provided by PRC 4291. Currently, PRC 4291 is insufficient to prevent fire spread from vegetation to a structure. The diagrams below are from CAL FIRE's 4291/defensible space recommendations (<https://www.fire.ca.gov/programs/communications/defensible-space-prc-4291/>). Current fire behavior indicates the distances in these diagrams (Figures 18 and 19) should be *doubled*:



Figure 18: Recommend **doubling** minimum vertical clearance to 12 feet or 6x height of shrub.

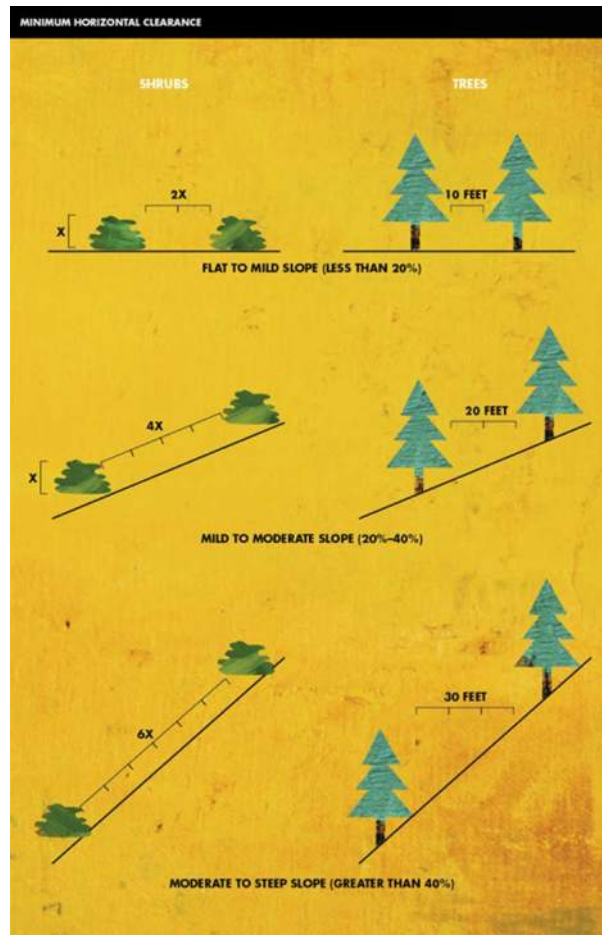


Figure 19: Recommend **doubling** minimum horizontal clearances shown.

Reducing Structure Ignitibility

The losses in the last five years have been the highest in California since the 19th century. Residential losses in the Caldor Fire alone are staggering. CAL FIRE reports that 1,003 structures were destroyed and 81 damaged (<https://www.fire.ca.gov/incidents/2021/8/14/caldor-fire/>). It's difficult to predict structural loss, but for most buildings within the WUI, it is no longer a question of *if* they will burn, but *when* they will burn.

Structures Damages or Destroyed by Year:

Fire Year	Number of Structures Damaged or Destroyed
2021	3,629
2020	10,488
2019	732
2018	24,226
2017	10,280

Table 1: CAL FIRE structure damage and destruction data

There are a variety of resources available to educate homeowners and public officials on home hardening techniques and technologies. We recommend the OVPSD pursue grant opportunities related to home hardening education and implementation.

A report published in the *Journal of Fire Ecology* titled "Housing arrangement and vegetation factors associated with single-family home survival in the 2018 Camp Fire, California" by Eric E. Knapp, Yana S. Valachovic, Stephen L. Quarles and Nels G. Johnson outlines those concerns:

<https://fireecology.springeropen.com/track/pdf/10.1186/s42408-021-00117-0.pdf>

Strong associations between both distance to nearest destroyed structure and vegetation within 100 meters and home survival in the Camp Fire indicate building and vegetation modifications are possible that would substantially improve outcomes. Among those include improvements to windows and siding in closest proximity to neighboring structures, treatment of wildland fuels, and eliminating near-home combustibles, especially in areas closest to the home (0-1.5 meters)...

While our data show a relationship between home loss and vegetative fuels (high pre-fire overstory canopy cover likely associated with a greater litter and woody fuel abundance, as well as other wildland understory vegetation) that can contribute to fire intensity and ember generation, the WUI fire loss issue has been described as home ignition problem more so than a wildland fire problem (Cohen 2000; Calkin et al. 2014). The damaged home data were in line with this view, with few homes showing evidence of continuity with wildland fuels that would contribute to flame impingement, but numerous homes with near home fuels, both from manmade and natural sources, that led to direct or indirect ember ignitions.

This document is well worth the read for all homeowners and those assessing risks to their homes in the Wildland Urban Interface. It addresses issues of home hardening and vegetation in and around homes and contains invaluable information on preventing destruction.

Another excellent source of information is *Reducing the Vulnerability of Building to Wildfire: Vegetation and Landscaping Guidance* available at <https://anrcatalog.ucanr.edu/pdf/8695.pdf>

Providing Public Education Measures

Public education on wildfire risk and prevention is carried out by the Olympic Valley Fire Department, U.S. Forest Service and CAL FIRE. Palisades Tahoe hosts an annual “Area of Refuge” evacuation drill, a simulated scenario that teaches participants what to do in the case of an approaching wildfire. During the event, OVFD, the O.V. Firewise Community, North Tahoe Fire Protection District, CAL FIRE, Placer County Sheriff and California Highway Patrol present information regarding wildfire procedure and safety.

There is an abundance of information on wildfire risk and prevention, though it can be difficult to filter and distribute it to the public in a way that encourages them to use on their property. Here is a list of recommended materials that we recommend linking to on the OVPSD website:

- Community fact sheets for fire prevention (http://calfire.ca.gov/communications/communications_factsheets)
- Child-focused activities (http://calfire.ca.gov/communications/communications_justforkids)
- PreventWildfireCA.org
- Firewise USA communities (<http://www.firewise.org/usa/index.htm>)
- California Wildland Coordinating Group (<http://preventwildfireca.org>)
- Other publications, webinars, and fact sheets (<http://ucanr.edu/sites/forestry/Wildfire/>)

There are several events during which wildfire awareness and prevention are showcased. These include the National Fire Prevention Week held annually in October (<http://www.nfpa.org/fpw>), Firewise workshops and a Community Wildfire Preparedness Day, usually held in May.

Another program is Ready, Set, Go! (<http://www.readyforwildfire.org>) managed by the International Association of Fire Chiefs, which was launched in 2011. In this program, being “ready” means doing as much as possible to reduce risk on your property. Getting “set” for evacuation during a fire means preparing emergency items and staying in touch with local media. “Go!” when there is a fire means following your personal plan, which may include evacuation, sheltering in place or other actions.

Preventing fire starts is an important mitigation strategy that is applied at the community scale. Since 1980, CAL FIRE's “volunteers in prevention” program has engaged many people in making classroom presentations, disseminating information on preventative measures to the public, and developing procedures for reducing ignitions in areas where they have been historically common. During periods of high to extreme fire danger, signs may be used to inform people of the danger. Burn bans are generally in affect all summer in the Olympic Valley and are announced on a large message board at the entrance to the valley. There are many instances where extensive wildfires have been caused by accidental ignitions due to campfires or trash burning during prohibited weather conditions.

There is no lack of information available on reducing community risk of wildfire. The greater issue is whether this information is reaching potentially affected community members in meaningful ways that catalyze action for readiness. Recommended ways to effectively engage the public in the educational process include workshops, media campaigns, informational booths at local fairs and events, and person-to-person dialogue. Effective information transfer is a critical challenge and experience shows that a “one size fits all” approach doesn’t work. Seizing opportunities when they arise demands skill and attentiveness on the part of service providers.

For mitigation strategies such as improving emergency access and roads, improving water supply, enforcing regulations and implementing fuel treatments there must be concerted and sometimes costly efforts spearheaded by local agencies and entities such as the county Firewise Council. Public education can play a role in rallying support for projects that reduce risk. Ultimately, prioritization of projects will be constrained by the availability of funding or assistance programs that can provide financial support.

Improving Road Access for Emergency Response and Evacuation

At the community level, roads must be able to both facilitate emergency response and evacuation in the event of a fire. Community and agency input have raised the issues of road width to simultaneously accommodate evacuees and incoming fire equipment, bridge width and strength (to support fire apparatus) and overgrown or brushed-in roads. Steep terrain and narrow, steep roads, poorly maintained roads, locked gates, and dense roadside vegetation can all impair movement. In the worst of cases, "traffic jams" caused by poor access and heavy traffic can contribute to fire spread and fatalities.

Currently, there is one road in and out of the community, connecting to State Route 89. The Olympic Valley has long considered a "jitney" road that follows the south side of the meadow connecting the village to SR 89 as a public transportation route. If constructed, this road would be an asset to the community in the event of an emergency.

Maintaining all roads in the Olympic Valley is important to facilitate traffic flow through the community, the most crucial corridor is Olympic Valley Road, followed by Squaw Creek Road. It is essential to ensure that areas around these roads are clear of debris and that fire treatment has been completed to prevent any fallen trees or other obstacles from blocking the road in the event of a fire. The S-Turns Forest Fuels Reduction Project currently in progress is tackling some of these potential hazards.

Roadside hazards must be removed through thinning, mastication and chipping to ensure that evacuations can go smoothly and quickly, while also facilitating safe movement of incoming fire personnel. The community of Olympic Valley has one entrance and exit, so it is crucial that thickets of trees along Olympic Valley Road be kept thinned to reduce fire behavior to a level prevents the road from being closed during a fire. Squaw Creek Road should also be treated for potential fire hazards.

Reducing Forest Density Across Large Areas Adjacent to Assets at Risk

Forest thinning projects can slow or stop an encroaching fire by starving it of burnable materials. This is accomplished through thinning, mastication and burning existing fuels under controlled situations. One potential area for Olympic Valley to reduce forest density on a large scale is on the north ridge bordering the valley (OV-1). Any thinning projects should be followed with broadcast or pile burns.

Currently, the community is surrounded by dense, overgrown forests on three sides. A buffer zone (OV-4) around structures within the valley is also recommended to further reduce fuels in the area that immediately surrounds high-value homes and essential facilities. This project can be accomplished with a combination of hand-thinning, piling and burning, mechanical logging, and mastication.

Finally, additional prescribed burning between the ridgetop thinning project and community buffer zone can be used to further reduce fuel loads.

Both the ridgetop forest thinning project and community buffer projects should be considered a secondary priority to achieving defensible space in the neighborhoods. Any fire which is sufficiently established on the landscape to threaten Olympic Valley will likely be able to spot over a 150-foot community buffer and spread across overgrown lots within the neighborhoods.

Fuels Management on National Forest Lands Adjacent to Olympic Valley

The Tahoe National Forest has recently identified the Five Creeks Project, which promises to be a major fuels management initiative to provide protection for the Olympic Valley community. The project area aligns with the Truckee River and the State Route 89 corridor, south of Truckee and north of the Olympic Valley, approximately five miles northwest of Lake Tahoe.

The following map (Figure 20) shows the area of treatment currently proposed by the Tahoe National Forest and more information on the project can be found at: <https://www.fs.usda.gov/project/?project=60390>

The Alpine Meadows and Olympic Valley Fire Protection Project (Figure 21) is a 1,080-acre project that will reduce fuel loading and promote forest health on the Tahoe National Forest surrounding the communities of Alpine Meadows and Olympic Valley. Surveys and analysis are currently in progress and on-the-ground work is scheduled to begin in 2024.

Five Creeks Project

Proposed Action

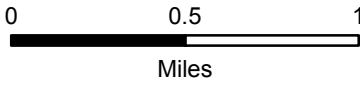
Vegetation / Fuel Reduction and Habitat Enhancement Map

- Map 2 of 3 -

1:35,000



This map product is reproduced from geospatial information prepared by USDA, Forest Service. GIS data and product accuracy may vary, and be developed from sources of differing accuracy, accurate only at certain scales; based on modeling or interpretation, incomplete while being edited or revised; etc. Using GIS products for purposes other than those for which they were created may yield inaccurate results. The Forest Service reserves the right to correct, update, modify or replace GIS products without notification.



- | | | |
|---------------------------------|--|----------------------------|
| Project Boundary | Mechanized Thinning < 30% | Estimated CSO Territory |
| Wildland Urban Interface | Mechanized Thinning > 30% | State Highway |
| Defense Zone | Mechanized Thinning <30% & Plantation Thin | Major Road |
| Threat Zone | Plantation Thin | Railroad |
| Meadow | Hand / Mech Thinning (Non-Merch/Biomass) | Structure |
| Perennial Stream | Prescribed Burning | Tahoe National Forest Land |
| Intermittent Stream | Aspen Enhancement | Other National Forest Land |
| Ephemeral Stream | Meadow Enhancement | Other Owned Land |
| | CSO PAC Habitat Enhancement | |
| | NOGO PAC Habitat Enhancement | |

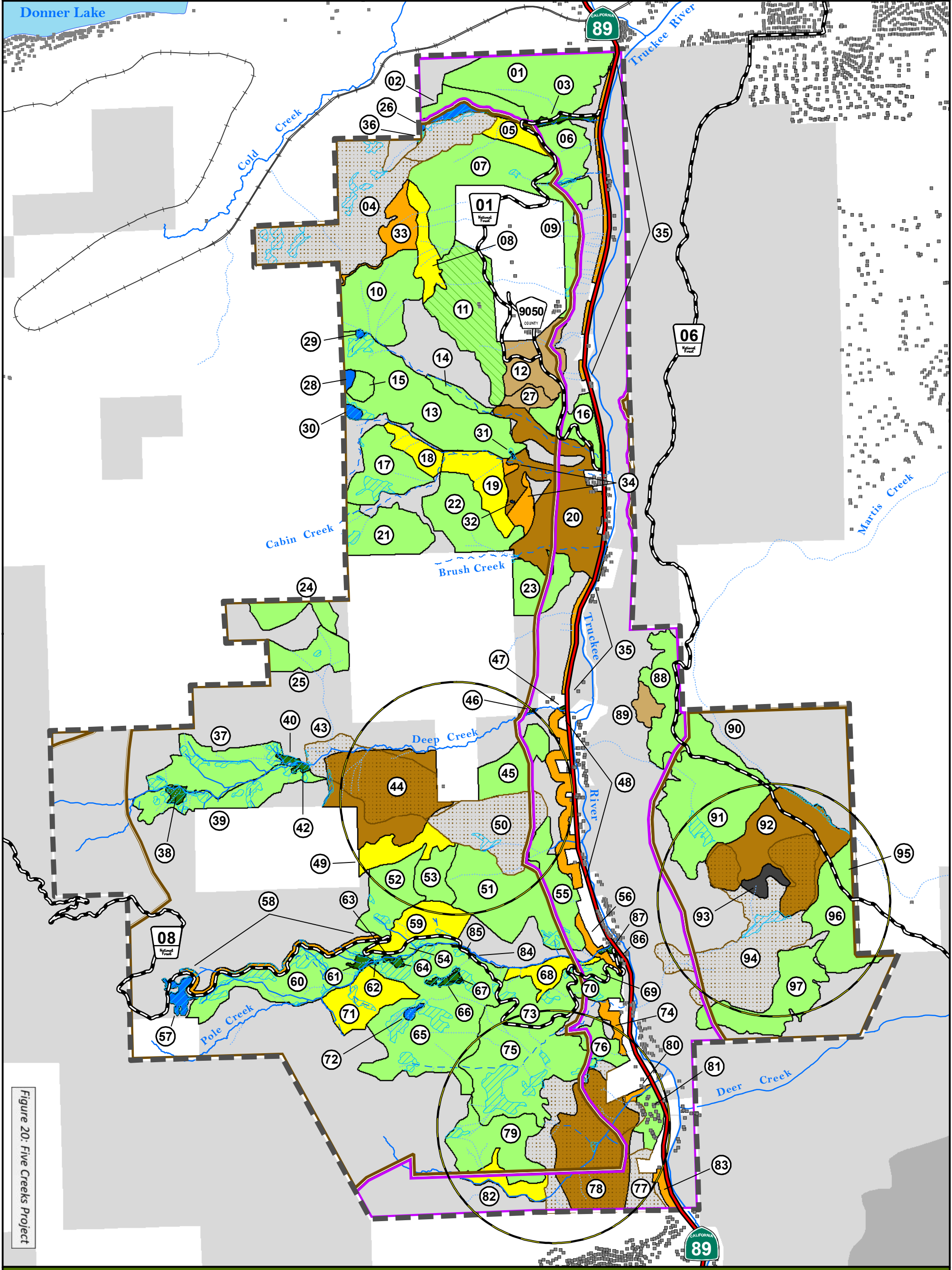


Figure 20. Five Creeks Project

Alpine Meadows Fuels Reduction Project

Legend

Project Area - 1,080 Acres

Funded - 826 Acres

Unfunded - 254 Acres

Structures

Transportation System

Road Closed to Vehicular Traffic (ML1)

Dirt Road (ML2)

Improved Road (ML3-5)

County Road

State Highway

Interstate & US Highway

Motorized Trail

Non-Motorized Trail

Land Status

Tahoe N.F.

Adjacent National Forest

Wilderness

Other/Private

Waterbody

Lake/Pond

Swamp/Marsh

Stream

Intermittent

Perennial

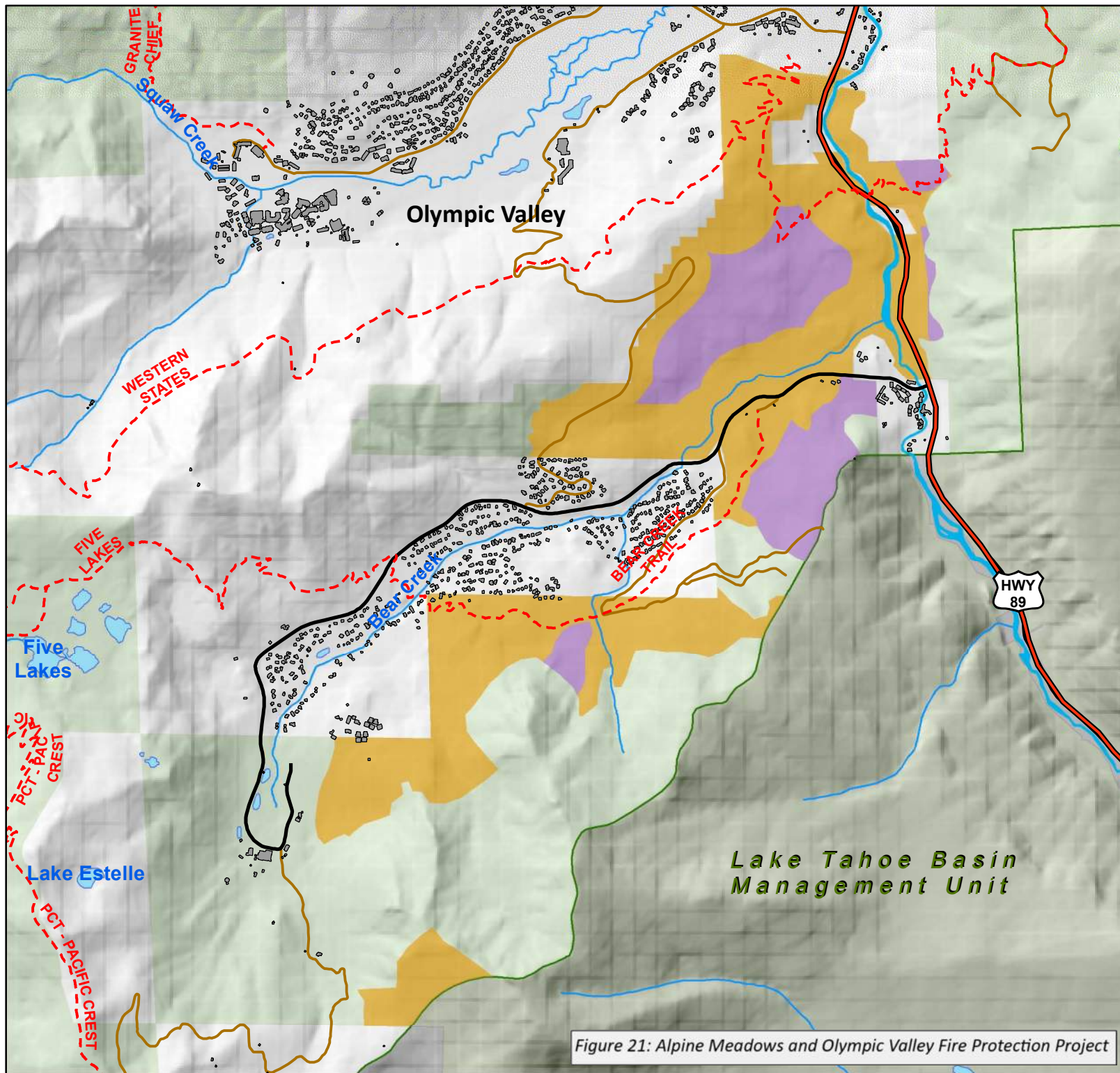
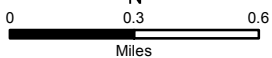


Figure 21: Alpine Meadows and Olympic Valley Fire Protection Project

Improving Water Supply and Water Delivery Infrastructure

Olympic Valley depends on a single-source water supply with distribution primarily provided by the Olympic Valley Public Service District or Squaw Valley Mutual Water Company. The map below (Figure 22) shows the water storage tanks and the hydrant system within the valley. The water system and hydrants are adequate for structure protection and there are ponds and surface water areas that helicopters can dip out of. An additional water storage tank has been evaluated as part of an emergency inter-tie for the district's water system, which could provide additional storage for fighting wildfire.

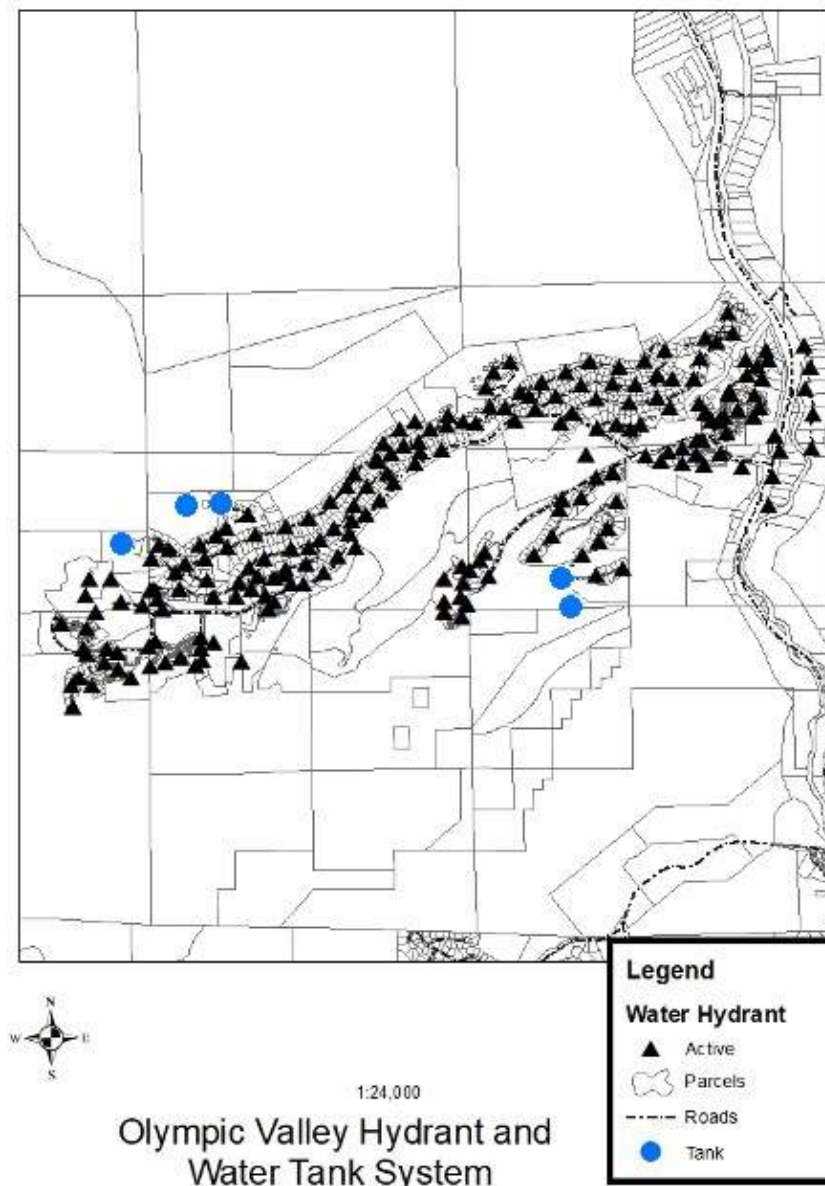


Figure 22: Hydrant and water tank locations

Improving Communication and Warnings in the Event of a Fire

Olympic Valley Fire Department utilizes a community wide emergency notification system called Nixle. Members of the community can sign up at nixle.com to receive emergency evacuation information and other important emergency preparedness tips from local fire and police departments. Truckee departments use the same system.

Placer County has a system called Placer Alert that residents are encouraged to use in order to be notified of evacuations and emergencies near them: <https://www.placer.ca.gov/2426/Placer-Alert>

In the neighboring county to the north, Nevada County uses a system known as Code Red with a similar registration system that residents may also wish to subscribe to:

<https://www.mynevadacounty.com/2713/Emergency-Alerts>

Another place to find information for evacuation preparation is on the website sponsored by CAL FIRE:

<http://www.readyforwildfire.org/>

Emergency information is also available through local radio and TV stations:

Local Radio:

West of the Sierra and Donner Summit	East of the Sierra and Donner Summit
KAHI AM 950	KOH AM 780
KFBK AM 1530	KTKE 101.5
KGBY FM 92.5	KOWL AM 1490
KNCO AM 830	KRLT FM 93.9

Local TV:

West of the Sierra and Donner Summit	East of the Sierra and Donner Summit
KCRA Channel 3	KOLO Channel 8
KOVR Channel 13	KTVN Channel 2
KXTV Channel 10	KRNV Channel 4
KTXL Channel 40	
KMAX Channel 31	
KQCA Channel 58	

As identified in the Local Hazard Mitigation Plan, June 2021:

The population of Olympic Valley can increase more than ten-fold over the course of several hours on a Saturday morning. Presently, there is no way of effectively alerting most residents and visitors of a hazard and the actions to be taken in response.

A community-wide emergency notification system could be implemented with relative ease and cost efficiency in a compact area like Olympic Valley. Permanent, changeable message boards located along [Olympic] Valley Road at the west and east ends of the Valley could be used to alert residents and visitors of a hazard and refer them to the frequency for a low-power FM transmitter that would transmit more detailed information and recommended courses of action.

Chapter 6: Priority Projects to Reduce the Impacts of Wildfires

In the table below (Table 2), we list project recommendations by priority. Project OV-1 is for the treatment of 120 acres to the north of the community. This is in progress and will be paid for with a CAL FIRE fire prevention grant (Project Number 21-FP-NEU-0209). Other priority projects include improving defensive space around structures, enforcement and chipper projects. The remaining projects are for roadside hazard improvements, creating a hazard reductions zone around the community and the use of prescribed fire to reduce fuels. A major fuels projects map (Figure 23), additional information on project goals and further recommendations follows.

PROJECT NAME	PRIORITY	PROJECT DESIGNATOR	PROJECT DESCRIPTION	TREATMENT TYPE	ACRES	ESTIMATED COST
Olympic Valley North Forest Thinning	1	OV-1	Forest thinning on northern boundary of valley adjacent to USFS lands	Thinning, mastication, prescribed burning	120	\$540,000
Olympic Valley and Truckee Corridor Defensible Space	1	D-Space	Fuel reduction around homes, buildings and structures on non-compliant lots.	Thinning, mastication, hand cut, chip	401	\$1,000,000 To be reimbursed by property owners.
Defensible Space Enforcement	1	D-Space Enforcement	Inspection and enforcement of State defensible space regulations	Education and violation notices Abatement by contractors	106	\$150,000
Chipper Program	1	D-Space Chipper	Contract chipper program	Chipping of material cut by homeowners	401	\$300,000
Olympic Valley Roadside Wildfire Safety	2	OV-3	Roadside hazard reduction	Thinning, mastication, hand cut, chip	60	\$150,000
S-Turns Forest Fuels Reduction Project	2	S-Turns	Roadside hazard reduction	Thinning, mastication, hand cut, chip	2.7	\$50,000
Olympic Valley Community Wildfire Buffer Project	3	OV-4	Create a fire hazard reduction zone around the community	Hand cut pile and burn or chip mastication, mechanical thinning	133	\$716,000
Prescribed Burns and Thinning	4	OV-2	Prescribed fire use and forest thinning	Prescribed fire, thinning, hand cut, chip	97	\$300,000

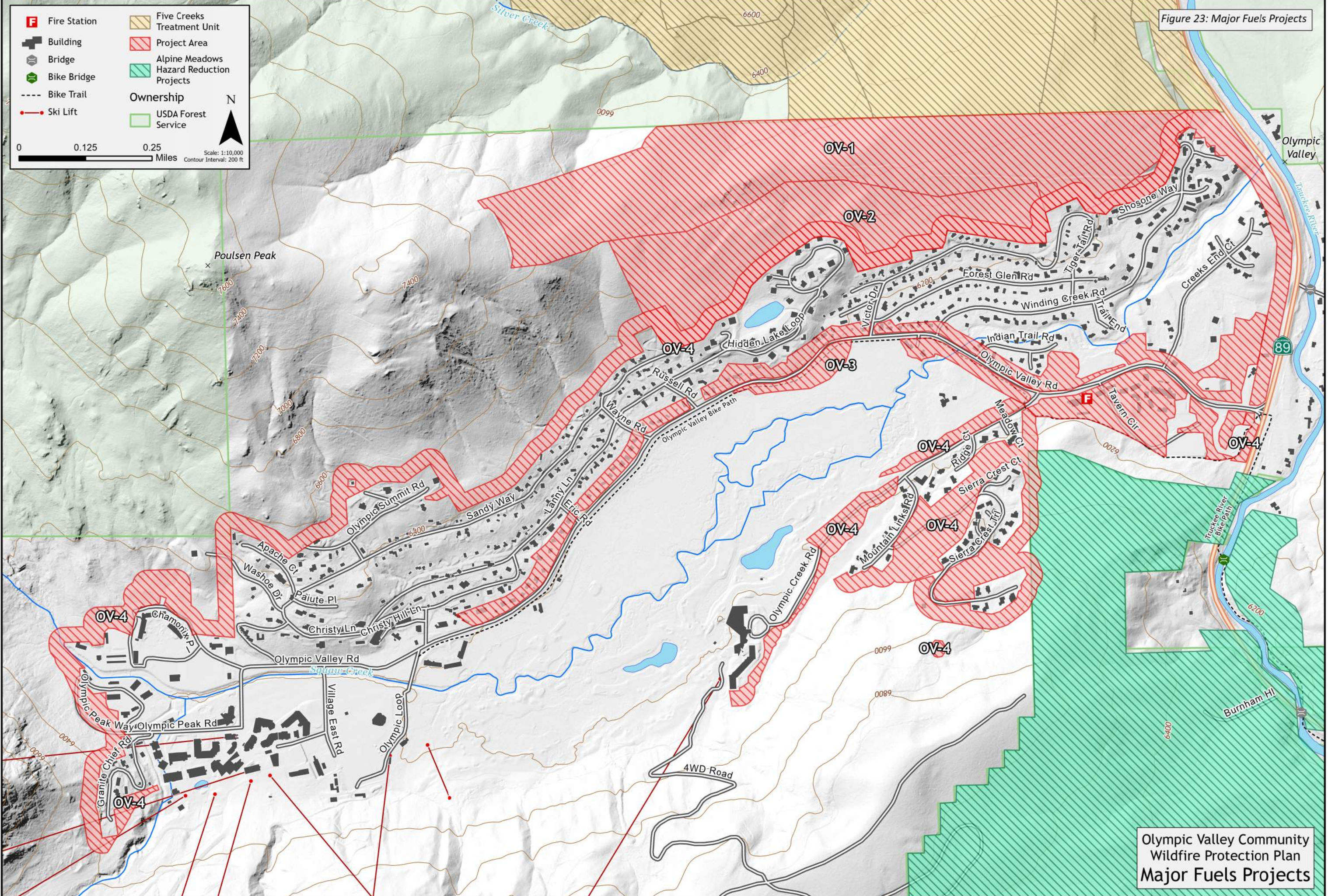
Table 2: Priority Projects

Figure 23: Major Fuels Projects

Fire Station	Five Creeks Treatment Unit
Building	Project Area
Bridge	Alpine Meadows Hazard Reduction Projects
Bike Bridge	Ownership
Bike Trail	USDA Forest Service
Ski Lift	

Scale: 1:10,000
Contour Interval: 200 ft

0 0.125 0.25 Miles



Olympic Valley Community
Wildfire Protection Plan
Major Fuels Projects

Olympic Valley North Forest Thinning (OV-1)

Funded by a grant from CAL FIRE (Project Tracking Number: 21-FP-NEU-0209), fuel break planning and construction is in process. This break will cover 120 acres on the ridgeline north of the community using mechanical thinning methods. This break will significantly reduce flame length, intensity, rate of spread and potential duration of wildfire in the area and provide protection for approximately 900 habitable structures in Olympic Valley as well as improved safety along the major evacuation routes of Squaw Valley Road and State Route 89. Additional information on the project can be found in Appendix A.

Defensible Space Projects

Three defensible space projects are recommended, starting with fuel reduction and improved clearance around homes, buildings and structures on non-compliant lots. This work should be completed using a combination of thinning, mastication, hand cutting and chipping to reduce fuels within 100 feet of all structures (Figure 24). While some property owners within the community may already be in compliance, we recommend increasing enforcement to ensure total coverage of the community. Uncleared and improperly maintained lots pose a threat to both their immediate neighbors and the entire community. Grants should be sought to bolster enforcement efforts and those efforts should take place immediately following snow melt to ensure that work is completed prior to peak fire season during the summer months. Finally, we recommend contracting with a chipper program to assist property owners in clearing their lots. This will allow free or discounted rates to individuals and provide an incentive for property owners to complete the work in a timely manner.

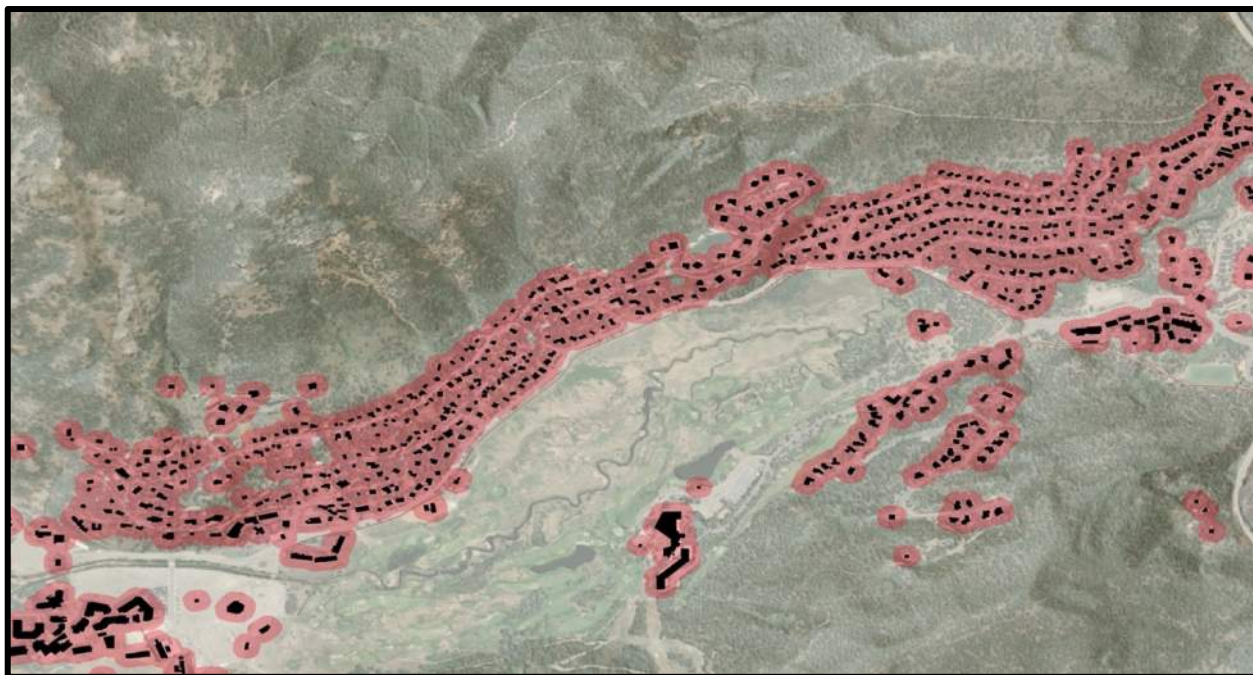


Figure 24: Reducing fuels within 100 feet of all structures will achieve near-total coverage of entire community.

Roadside Wildfire Safety (OV-3)

In the event of a fire emergency, movement into and out of the valley is of paramount importance. Clear and safe roads are essential for ingress of fire personnel and egress of evacuees. Currently, there is one entrance and exit into the valley, a potential traffic bottleneck. For efficient travel, we recommend roadside hazard reduction along Olympic Valley Road and Squaw Creek Road to eliminate any potential trees or other objects (signs, structures, etc.) do not fall into the roadway if they catch fire. The S-Turns Forest Fuels Reduction Project has already been funded and began in December 2021 to reduce a 2.7 acre stand of lodgepole pine on the south side of Olympic Valley Road in the Washeshu Creek meadow.

Olympic Valley Community Wildfire Buffer Project (OV-4)

We recommend a thinning and fuels reduction project surrounding the perimeter of homes, buildings and other structures in the valley. In the event of an encroaching fire, this will provide the community an additional layer of safety on top of individual lot maintenance. This buffer would be constructed through a combination of hand cut piling and burning, chipping and mechanical thinning.

North Valley Prescribed Burns and Thinning (OV-2)

We are a strong proponent of prescribed burns and highly recommend reintroduction of fire onto the landscape to reduce fuels. Project area OV-2 (between the community buffer and the north forest thinning project) is a recommended place to use fire. Mechanical and hand thinning of fuels is also recommended in this area. In coordination with Alpine Meadows community, prescribed burns may also be recommended on the south valley and ridge, too.

Additional Potential Projects

The table below (Table 3) outlines many other projects used in similar communities for which Olympic Valley could seek funding.

A. Information, Education and Planning	
1	Fund public education Continue to seek funding to support development of education and outreach materials for wildfire safety, fire ecology, and ecologically-based vegetation management. Olympic Valley is considering the use of FireAside (https://www.fireaside.co) defensible space software that has potential to help with public education, currently used Truckee Fire.
2	Continue to expand information & education to residents Specific topics include ember awareness and what causes homes to ignite and burn in a wildland fire, the need for annual springtime mowing of grasses and weeds, fire ecology, grazing, prescribed fire and weed management. Programs should also address: the need for safe access and signage, the importance of available water, adequate fire protection, and the critical role vegetation, drought and weather plays in wildland fire.

3	<p>Expand awareness of wildfire issues related to landuse planning and building Local and state agencies should provide educational information for civil engineers, developers, realtors, contractors, home builders, and building inspectors on methods to ensure structural and forest survival following a wildfire.</p> <p>Educational programs should follow PRC 4290 and the State Fire Marshall WUI Standards, with a focus on what causes homes to ignite and burn in a wildland fire. Programs should also address the need for good home site location, wildfire-resilient layouts, safe access and signage, the importance of available water, adequate fire protection and the critical role topography plays in wildland fire behavior.</p>	
4	<p>Evacuation planning Further promotion of Palisades Tahoe’s annual “Area of Refuge” event. The simulated evacuation drill teaches participants what to do in the case of an approaching wildfire and past events have included presentations from local and state agencies.</p>	
B. Structure Ignitability		
<p>The first priority for wildfire hazard mitigation actions is immediately around structures, the home ignition zone and within five feet (minimum) from the building. Research shows fire prevention measures within the first five feet play the largest role in home survival. The level of attention given to a residence in terms of its vulnerability to ignitions is controlled by the owners who must be prepared well in advance of a fire event.</p>		
1	<p>Existing structures and attachments Strengthen building standards for construction, replacement activities and enforcement of compliance for existing residences and properties to make them less prone to loss from a wildfire due to combustible vegetation, embers, radiated heat or surface fire spread. One challenge to the Olympic Valley is the window between snow melt and first snow that allows for property inspection, enforcement and mitigation work to be completed. This short timeframe for enforcement is further hampered by the community’s need for code enforcement staff.</p>	
2	<p>Defensible Space – Lean, Clean, Green Zone (5-30’) and Reduced Fuel Zone (30-100’) Eliminating flammable vegetation within the 0-30’ zone can significantly increase the chances of home survival during a wildfire threat. Reducing flammable vegetation within the 30-100’ zone to comply with California Public Resources Code 4291 can significantly increase the chances of home survival. As noted in other portions of the report, our recommendation is to impose stricter defensible space measures than those recommended by state ordinances.</p>	<ol style="list-style-type: none"> 1. Provide information and education on methods to create defensible space and fire safe landscaping (5-30’) – Starting with the flammable free first 5 feet from the structure the emphasis should be on vegetation and landscaping materials that do not readily accept embers and perpetuate fire spread, along with keeping roofs and gutters free of leaves and needles. 2. Provide information and education on methods to create defensible space in the Reduced Fuel Zone (30-100’) – Emphasis on reducing fuel ladders and increasing spacing between bushes and trees, so that flames and embers are reduced lessening the perpetuation of fire spread 3. Implement & seek additional funding assistance programs for weed abatement and building upgrades for qualifying senior and disabled citizens in priority areas.

C. Suppression Capabilities and Public Safety

The Olympic Valley Fire Department has two Type 3 fire engines, considered suitable for wildland fire suppression. Off-road wildland fire engines such as Type 6 and 7 engines or UTVs allow firefighters the resources needed to address potential catastrophic wildfires in the WUI, and to support neighboring agencies in addressing complex fires in their jurisdictions. Given the severity and destructive nature of fires in the WUI, ongoing drought and climate change, expanding the fire department’s wildland fire-specific equipment should be a priority moving forward.

Priority access improvement projects and regional-scale mitigations include:

- Ensuring all bridges have appropriate weight rating signage
- Improve all EVA (Emergency Vehicle Access) roads in the valley and river corridor.

Risk Condition:		Mitigation Measures:
1	Fire protection access to some lots in Olympic Valley is difficult due to overgrown or uncontrolled vegetation. Access to these properties may not be possible during a fire.	Educate the public about wildfire hazards and encourage landowners to create gated access to larger lots, right-of-ways, and other areas with significant wildland vegetation.
2	Signage is critical to agencies providing emergency services, not only for wildland fire purposes, but all emergency vehicle access. Olympic Valley should strive to have all residences and communities meet CA Fire Safe Standards (PRC 4290) for road and address signage.	Educate property owners on proper signage and explore homeowner incentives for fire safe house signing. Bridges should have approved weight-rated signs.
3	Driveways and private roads are critical to agencies providing emergency services, not only for wildland fire purposes, but all emergency vehicle access.	Educate property owners on the need to maintain adequate clearance to allow passage of large fire engines safely. This includes providing turn-outs and improved turn arounds for large fire vehicles.
4	Gates should be in working order, wide enough for fire vehicles and accessible.	Educate residents on importance of emergency access through gates and existing gate code requirements should be enforced. There should be evacuation access in and out of all gated communities.
5	Vegetative clearance must be maintained. Some existing private roads and driveways are too overgrown for fire apparatus.	Encourage homeowners to maintain for fire safe driveway vegetation clearances. Vegetation should be cleared 14 feet horizontally and 15 feet vertically along driveways.

6	Improve all Emergency Vehicle Access throughout the valley.	<p>Make improvements to access roads and any 4WD roads that may be used as evacuation routes.</p> <p>To alleviate potential traffic pressure on the sole entrance and exit into the valley, the Olympic Valley community has considered the construction of a “jitney” road that follows the south side of the meadow connecting the village to State Route 89 as a public transportation route and evacuation option.</p>
7	Water systems Water is a premium commodity in the suppression of both structural and wildland fires. Water flow or storage for firefighting must be considered with any increased housing density in the future.	<p>Fire departments should be consulted and included in general plan updates or other planning processes which increase housing densities that may affect water flow and storage. Local agencies should work collaboratively to identify opportunities to improve water storage, access, signage and development for firefighting on public and private lands.</p> <p>An additional water storage tank has been evaluated as part of an emergency inter-tie for the District’s water system, which could provide additional storage for fighting wildfire.</p>
D. Hazardous Fuel Reduction		
Risk Condition:		Mitigation Measures:
1	Vegetation on developed lots. An excess of hazardous fuel around structures places many homes at risk of ignition from wildfires not necessarily originating from outside of the community.	<ol style="list-style-type: none"> 1. Continue to educate residents on the need for creating structure survivable space by complying with measures <i>more stringent</i> than PRC 4291 2. Seek funding for a full-time Fire Prevention/Risk Reduction Officer and seasonal Code Enforcement Staff and Inspectors. 3. Increase surveys and enforcement of weed abatement regulations. Develop program where funds for weed abatement could be recouped by landowner or tax liens.
2	Hazardous vegetation on vacant lots. Undeveloped lots with extensive fuel loading place neighboring homes at risk.	Enforce fuel reduction policies, even on smaller, undeveloped lots.

3	<p>Addressing and maintaining wildfire hazards in planned subdivisions or developments. Hazardous fuel treatment must be part of an ongoing strategy in order to maintain a fire-resistant condition in the future. Once new developments establish a fire resilient condition, there should be a written strategy and long-term funding to maintain that condition and an assignment of responsibility should be required.</p>	<p>Require developers to consult wildfire experts when developing their subdivision maps. Special attention should be paid to building spacing and alignment of multiple structures with prevailing fire weather. Require open space and trails which can be used for firefighting or as control lines for prescribed burns. Open space, trail, and road alignments should be developed in collaboration with wildfire behavior experts. Consider modification of codes to require a plan and legally-binding funding mechanism to fund ongoing and future vegetation management around the margins of new developments.</p>
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E. Building Prescribed Fire and Wildfire Management Capacity

There are a wide variety of opportunities to use fire to improve the function, safety, aesthetics and resiliency of the Olympic Valley while also helping educate the general public on fire’s many ecological and public-safety benefits. The community should build upon and expand existing fuels management program with a registered professional forester and seek grant applications to fund projects.

The fire department should develop a training plan for prescribed fire qualifications, and pursue training opportunities.

The public is interested in learning more about prescribed fire, but opportunities are limited to provide direct access during burns or provide interpretive materials after the burn. Consider introducing an educational program, which includes live prescribed fire demos. Olympic Valley should also develop outreach and messaging programs to prepare public for increased use of fire.

Table 3: Potential Projects

Chapter 7: Monitoring and Evaluating CWPP Recommendations and Accomplishments

Monitoring and Evaluation

A CWPP does not end after adoption. A thorough process involves a continuous cycle of collaborative planning, implementation, monitoring and adapting strategies based on lessons learned. As communities learn from successes and challenges during the development and implementation of their CWPP, stakeholders may identify new actions, propose a shift in how decisions are made or how actions are accomplished, and evaluate the resources necessary for successful CWPP implementation.

- Track accomplishments and identify the extent to which CWPP goals have been met.
- Examine collaborative relationships and their contributions to CWPP implementation, including existing participants and potential new partners.
- Identify actions and priority fuels reduction projects that have not been implemented, and why; set a course for future actions and update the plan.

Responsibility for monitoring evaluating and updating the CWPP falls on the Community of Olympic Valley. Guidelines for monitoring and evaluating a CWPP can be found in “Community Guide to Preparing and Implementing a Community Wildfire Protection Plan,” located in Appendix G.

Communities and agencies may want to work together to ensure that, at a minimum, data are collected to evaluate the plan measures to gain consistency. The community must recognize that fire safety is rapidly changing. It is likely that new developments and new sources of money in fire safety will change from year to year. It is recommended that this plan be reviewed on an annual basis by the fire districts with updates every five years or sooner if necessary.

Appendix A: Olympic Valley North Forest Thinning (OV-1) Project Description

Source: Source: CAL FIRE, California Climate Investments Fire Prevention Program Grant Application - Project # 21-FP-NEU-0209. Danielle Bradfield, 2022

The forest thinning areas to be treated by project OV-1 are dominated by Sierra Mixed Conifer stand type of excessive stand density ranging from 180-220 square feet basal area per acre. Species composition is approximately 60% white fir, 30% Jeffrey pine, 6% sugar pine and 4% red fir, with an average of 240 trees per acre over 8 inches diameter at breast height (DBH). The average stand diameter at DBH of white fir is 12", Jeffrey pine is 14.3", sugar pine is 18" and red fir is 22.4". Cumulative pretreatment quadratic mean diameter is 13 inches DBH. Openings in the conifer overstory are dominated by native shrub species including manzanita and whitethorn and young growth white fir regeneration under 3" DBH.

Using fuel reduction methods including mechanical thinning, hand thinning and mechanical mastication, stand conditions in each fuel break will exhibit reduced horizontal and vertical continuity of fuels such that the potential flame length, intensity, rate of spread and duration of wildfire will be significantly reduced. This reduction in potential fire behavior provides for increased safety for residents and emergency personnel in a wildfire situation through reduced fire behavior.

To achieve these goals, post-treatment conditions should exhibit a reduced stand density of 75-100 square feet basal area per acre, depending on slope position. The stand quadratic mean diameter will be increased approximately 5 inches DBH as trees retained will generally be larger, more fire tolerant trees. The residual stand will contain a species composition that provides for increased stand vigor and resilience to future disturbance such as fire, insects, disease, and drought.

The abundance of white fir in the Olympic Valley poses a major problem in making the community fire resistant. To this end, the relative site occupancy of white fir will be reduced in favor of the more drought and fire tolerant native pine species. The crown height of white fir should be reduced, and lower limbs should be removed where bulk tree removal is not possible. The residual stand should exhibit lower crown bulk density and an increase in crown base height to reduce fuel continuity and the probability of crown ignition or sustaining a running crown fire. Surface and ladder fuels will largely be removed through a combination of mechanical and hand thinning and mechanical mastication.

Improved public safety through fuel reduction along a portion of Squaw Creek Road, the community's main evacuation route, is another expected outcome of the project. This improved access will provide for firefighter safety during ingress in the event of wildfire. Access roads leading from the community to the ridgeline north of the community will also be improved as part of forest product extraction involved with fuel break implementation. This improvement will support ingress and egress of emergency personnel during a wildfire event.

Olympic Valley is situated between two ridgelines north and south of the community, Granite Chief Wilderness to the west and the State Route 89/Truckee River Corridor to the east. Generally unmanaged timberlands exist to the north, east and south of the community, presenting the risk of wildfire entering the community from these areas. A fuel break along the northern ridgeline (OV-1) will preemptively allow for wildfire to be held outside of the community should it potentially enter from these directions. A wildland fire approaching either of the subject ridgelines will expose the Olympic Valley community to potentially significant ember cast, presenting the risk of fire spread within the WUI. Wind and convection columns can transport embers over considerable distances and cause susceptible structures to ignite even without active fire spread in the immediate area. Given that, reducing potential ember cast by keeping wildfire as far as feasible from the community is paramount to protecting the high-density residential setting within Olympic Valley.

Topography has a profound effect on fire behavior, and the Washeshu Creek corridor could funnel heat, wind and convection columns within the community should wildfire occur. The Washeshu Creek corridor is aligned with the prevailing surface wind pattern of the area, presenting additional risk of ember cast ignition or direct flame impingement for the multiple habitable structures located along both sides of this topographical feature.

Should habitable structures ignite, they become large ember generators, posing a significant threat to the surrounding area, particularly downwind structures and vegetation. By keeping fire outside of the community, the potential for structure ignition and fire spread are reduced. Implementation of the proposed fuel breaks will enhance existing ingress and egress from the wildlands to the north of Olympic Valley. Existing access roads will be cleared and made passable for forest product extraction, leaving these roads in an improved condition for use by emergency response personnel should a wildfire event occur. Further, hazardous fuels will be reduced along roads within the fuel breaks, further improving safety for fire suppression personnel. Collectively, these project outcomes will reduce the risks associated with wildfire to habitable structures.

The Local Hazard Mitigation Plan contains a list of critical facilities, infrastructure and other District Assets within Olympic Valley that are additional assets at risk to wildfire and will benefit from the proposed project:

1. High voltage power lines and associated electric power substation
2. AT&T Pac Bell Switching Station
3. Olympic Valley Public Service District infrastructure including vertical and horizontal wells, two wellhouses, one above ground booster pump station, one below ground booster pump station, five remote treatment unit sites, three sewer flow meters, backup power and servers, water and sewer lines
4. Olympic Valley Fire Department
5. Mutual Water Company infrastructure including structures and tanks, vertical wells, horizontal wells, one wellhouse, one above ground booster pump station and water service lines
6. Palisades Tahoe Ski Resort infrastructure including lifts, irrigation and domestic water supply
7. Resort at Squaw Creek water systems for irrigation
8. Thirteen bridges on public and private roads within the community
9. Communication lines
10. Truckee River, a bistate/federally regulated water way.

The project will remove targeted woody material to the greatest extent possible given market conditions, biomass facility availability and wood product demand. Small logs removed from the fuel breaks will be delivered to purchasing mills or firewood facilities in the region. The removal of firewood material from the project areas will allow for logs and treetops down to a smaller end diameter to be removed, leaving less slash on site. Should a biomass energy facility be available within a feasible haul distance of the project area and be actively pursuing woods-produced chips at the time of project implementation, this option will be prioritized to reduce overall greenhouse gas emissions.

The proposed fuel break locations are within the Very High Fire Hazard Severity Zone (VHFHSZ) as identified by the current Fire Resource Assessment Program Maps. The residential areas of the Olympic Valley community are also within the VHFHSZ. At the landscape level, the project areas are situated amongst contiguous miles of VHFHSZ within Placer County. A portion of the meadow system adjacent to Squaw Creek is identified as Moderate Fire Hazard Severity Zone.

The Five Creeks project area aligns with the Truckee River and the SR 89 corridor, south of the town of Truckee and north of Olympic Valley. The U.S. Forest Service has identified the project area and vicinity as a high use area, adjacent to Truckee along the Truckee River/SR 89 corridor which experiences significant visitation and contains critical infrastructure including developed campgrounds, private residences, recreation residences, transmission lines, the Placer County Eastern Regional Landfill, mountain biking, hiking and fishing trails, rock climbing destinations, and vehicles traveling from Interstate 80 to Lake Tahoe. The SR 89 corridor also serves as a major evacuation route for the Lake Tahoe Basin. In order to promote safe conditions while maintaining and enhancing the ecosystem services provided by the area, treatment has been warranted by the agency due to the high use nature of the area, its proximity to urban areas, the potential for high severity fire and forest health issues.

Due to the proximity of the Five Creek Project to the urban core of Olympic Valley and neighboring communities, management objectives for forests closest to the urban core and the WUI defense zone are to create or maintain an open forest structure, dominated by larger, fire tolerant trees. The resulting open-canopied forest and discontinuity of crown fuels, both horizontally and vertically, would result in a very low probability of sustained crown fire. Within the WUI threat zone, the objectives are to establish and maintain a pattern of area treatments that are effective in modifying wildfire behavior while maintaining or enhancing ecosystem services.

All projects identified will need ongoing maintenance in perpetuity. Zones and projects should be reassessed on a 7-10 year cycle.

Appendix B: Firewise Community

In April 2020 the Olympic Valley Community was recognized as a “Firewise Community.” This is a resident-led effort, supported by the fire department. Related information and documents are available on the OVPSD website: <https://www.ovpsd.org/ovfd/firewise-community>

For more information or to get involved, email the committee at OVFirewise@gmail.com

Olympic Valley Firewise Action Plan, 2020

A three-year Firewise action plan for Olympic Valley California. The project was expected to launch in Spring 2020.

Community Awareness - Firewise Committee	
Annual	Work with Squaw Valley Corp to establish community evacuation plan and run evacuation drills
Annual	Create and staff Firewise “table” at Squaw Valley Earth Day, Blues Tuesdays and other events in Village
Annual	Work with SVFD to conduct educational outreach program for Valley's homeowners, HOA Boards, and other residences
Annual	Participate in annual homeowner’s valley clean-up breakfast at the fire department
Year 1	Create a web based Firewise timesheet to record volunteer hours and spend. Integrate with SV Fire Department website
Year 1	Create an Olympic Valley Firewise website. Integrate with community organizations and social media outlets
Year 1	Create Firewise Information space on Post Office Bulletin Board
Year 1	Identify defensible space contractors in Valley and work with them to educate their customers on wildfire prevention

Defensible Space Action - Firewise Committee will educate owners on key preventive measures - Homeowner/Condo HOA/Resort	
Annual	Remove all combustible material from alongside the house such as firewood, BBQ charcoal and lighter fluid, leaves, pine needles, plastic garbage cans, recycling bins etc.
Year 1	Make sure address on the home is clearly visible in order to locate house year- round if needed. Should be lit at night
Year 1	Provide easy access to at least two 5/8” garden hoses, one on each side of the house, long enough to reach all areas of the yard
Year 1	Remove branches that hang over roof and keep dead branches more than 10 ft away from chimneys
Year 1	Within 5 feet of house, remove ornamental plants (junipers) and anything flammable and replace with rock, cement, pavers, pebbles, bare earth, green grass
Year 2	Thin spacing between plants in 5-30 foot zone from the house
Year 2	Eliminate tree ladder fuel (vegetation under trees) situations
Year 2	Clear vegetation from under or within 10 feet of propane tanks
Year 2	Move firewood at least 30 feet away from structures
Year 2	Within 30 ft keep lawns and native grasses mowed to a height of two inches or less; and 4 inches or less from 30 to 100 feet
Year 2	Prune trees up 6 to 10 feet from ground
Year 3	Dispose of heavy accumulations of ground litter/debris
Year 3	Remove dead plant and tree material
Year 3	Thin tree stands, remove small conifers from growing between mature trees, open canopy tops
Year 3	Remove vegetation adjacent to storage sheds or other outbuildings, separate garages

Building Improvement Action Items - Firewise Committee will educate owners on key preventive measures - Homeowner/ Condo HOA/Resort	
Year 1	Keep roofs and gutters free of leaf litter, etc.
Year 1	Clear needles and other combustible debris from areas where the roof intersects with walls (e.g., dormers)
Year 1	Store patio furniture cushions away from the house when not in use or during high fire danger weather. Store in the garage or outside storage shed away from the house
Year 1	Check that all soffit and crawl space vents are intact and are made of metal mesh, min 1/4", 1/8" is optimum
Year 1	Clear all construction and other debris from under the house and decks
Year 1	Plug gaps that occur between roof covering and roof sheathing (e.g., at roof edge)
Year 1	Replace wooden attachments to house with metal or other noncombustible material
Year 2	If have open-eave construction, seal or box in openings with noncombustible or ignition resistant material
Year 3	If financially feasible, convert decks to noncombustible material
Year 3	Paint siding with fire resistant paint
Year 3	If financially feasible, change combustible siding to noncombustible material
Year 3	If financially feasible, consider adding window shutters or other premade window covers

Other Firesafe Action Items - Firewise Committee	
Annual	Facilitate defensible space maintenance for residents through street pick-up, chipping, dumpsters
Annual	Work with large forested landowners and fire department to Identify priority for grants and write applications
Year 1	Engage with USFS, Placer County, and private landowners who own forested land above residential areas to get fire reduction action plan commitments
Year 1	Ensure that all water departments have backup generators for water supply
Year 2	Work with Placer County to install reflective, fire-resistant street signs
Year 2	Identify existing 501C Valley organization that can help Committee apply for grants

Table 4: Three-year Firewise action plan for Olympic Valley

Appendix C: Treatment Descriptions

The following descriptions are for general information as a reference to terms and recommendations discussed throughout the report. They can be applied to most fuel treatment scenarios in the Olympic Valley.

Treatment Prescriptions

Below are descriptions of typical landscape treatments designed to support wildland fire suppression, educational demonstration projects, roadside treatments to facilitate safer evacuations, maintenance treatments and critical individual clearance zones that minimize structure-to-structure ignitions. These general treatment techniques are typical of those currently used by private forest landowners, the U.S. Forest Service and described in the Sierra Nevada Framework. It is assumed that no new roads would be constructed to implement these projects.

Mechanical Thinning

Mechanical thinning utilizes heavy equipment with large hydraulically-driven saws to cut and remove trees (generally under 24 inches in diameter). The two major harvesting methods include whole tree removal (WTR) and cut-to-length (CTL). CTL machines use a 'stroke delimeter' to remove branches before automatically cutting a log to predetermined lengths. While WTR is preferable from a fuels-reduction standpoint, CTL machines create a mat of slash on which they can operate, reducing impacts to the soil. The slash vs. soil disturbance tradeoff must be considered on a site-specific basis. It is possible to use an in-woods chipper to reduce surface fuels in concert with CTL. Mechanical thinning equipment is generally confined to slopes less than 30%. WTR projects require large clearings or landings that can accommodate a skidder, a large chipper and semi-trucks. CTL operations require fewer and smaller landings.

Because projects proposed in this plan are primarily driven by wildfire fuel reduction concerns, whole tree removal should be practiced whenever possible. CTL should be used only in areas with high erosion hazard potential. A registered professional forester should make any decisions on types of equipment to be used in specific project locations.



Figure 25: Whole tree removal operation.

Mechanical thinning can create a more precisely targeted stand structure than prescribed fire. The net effect of removing ladder fuels is that surface fires burning through treated stands are less likely to ignite the overstory canopy fuels. By itself, mechanical thinning with machinery does little to beneficially affect surface

fuel loading. The only exception is that some level of surface fuel compaction, crushing, or mastication may occur during the thinning process. Depending on how it is accomplished, mechanical thinning may add to surface fuel loadings, increasing surface fire intensity. It may be necessary to remove or treat fine fuels that result from mechanical thinning.

Prescribed mechanical thinning can reduce stands from below by removing trees up to 30 inches in diameter at breast height (DBH). This thinning starts with the smallest diameter class, removing sufficient suppressed and intermediate trees to achieve an average crown base height of at least 20 feet and spacing of 10 feet between the crowns of residual trees. On drier sites and on southern aspects, it is recommended to focus on the removal of white fir over all other conifer species.

Common practice is to retain 2-5 dead standing tree (snags) per acre (minimum size of 24 inches DBH) and 3-7 large, downed logs per acre (minimum size 14 inches DBH and 20 feet long). The trees are removed by whole tree yarding and disposing of slash in stands should either be hand piled and burned or by chipped and scattered.

Mastication

Mastication is the process of using machines to grind, rearrange, compact or otherwise change fire hazards without reducing fuel loads. These treatments tend to be relatively expensive, and are limited to relatively gentle slopes and high value areas near homes and communities. Rocky sites, sites with heavy down logs and sites dominated by large trees are difficult places to operate mastication equipment. Additionally, sparks from mastication heads have the potential to start fires. When working on public land, these machines are subject to the same activity-level restrictions that apply to most other logging equipment.



Figure 26: Excavator with masticating attachment.

The ecological and fire effects of mastication treatments vary depending on the size, composition, and location of the fuels left after treatment. In many cases, mastication creates a window of 2-5 years in which surface fire intensity increases. While this may be offset by a decrease in crown fire potential, mastication tends to increase fuelbed continuity, and can increase fire rates of spread. Mastication is a useful tool in plantations and brushfields and has applications in thinning small trees for fuelbreak maintenance.

Prescribed mastication uses rubber tired or low-impact tracked vehicles to cut, chip and scatter all shrubs and small trees up to 10 inches DBH. Brush cover should be reduced by creating a mosaic of treated and untreated shrubs. Openings between shrubs should be twice the height of the shrubs and 50-70% of shrubs should be treated. Brush that is treated should be cut to the maximum stump height of 6 inches. No individual pieces of cut material should be greater than 4 feet long. All masticated stumps should be cut to within 6 inches of the ground. Debris should not average more than two inches in thickness over the entire project area. All cut vegetation should be kept within the unit boundaries. Any cut vegetation falling into ditches, roads, road banks, trails or adjacent units should be immediately removed.

Thin layers of masticated wood chips spread on the forest floor tend to dry and rewet readily. Deep layers of chips may have insufficient air circulation, resulting in poor decomposition. Moreover, when layers of small woody material are spread on the forest floor and decomposition does occur, the decomposing organisms utilize large amounts of nitrogen reducing its availability to plants. Therefore, the impact of any crushing, chipping or mulching treatment on decomposition processes and their potential contribution to smoldering fires needs to be considered.

Tractor Piling or Grapple Piling

Machines can be used to pile slash, brush and small trees. Trees under 8 inches DBH should be thinned out to 20 foot spacing. Most trees over 8 inches DBH will not be piled. Protection of desirable trees from bark damage and other injury is very important. Slash piles should not be piled near residual trees so when they are burned the piles will not damage the trees destined to remain onsite. Clean piles free of dirt and no larger than 15 feet tall and 15 feet in diameter are the goal. The piles should be partly covered with a 6'x6' piece of waterproof material to allow them to be burned after significant rain fall.

Prescribed Burning

Prescribed burning reduces the loading of fine fuels, duff, large woody fuels, rotten material, shrubs and other live surface fuels. Increased fuel compactness and reduced fuel continuity changes the fuel energy stored on the site, reducing potential fire spread rate and intensity. Burning reduces horizontal fuel continuity (shrub, low vegetation, woody fuel strata), which disrupts growth of surface fires, limits buildup of intensity, and reduces spot fire ignition probability.

Given current accumulations of fuels in some stands, multiple prescribed fires—as the sole treatment or in combination with thinning—may be needed initially, followed by long-term maintenance burning or other fuel reduction (mowing, for example), to reduce crown fire hazard and the likelihood of severe ecosystem impacts from high severity fires.



Figure 27: Prescribed burning operation.

Low intensity broadcast burning should be used to reduce all 100-hour fuels (< 3 inches diameter) by 60-80%, the brush component by 50%, and 75% of trees less than 3 inches DBH. Use fire to prune ladder fuels by scorching the lower 1/3 of branches on 100% of trees less than 8 inches DBH. Retain large down logs (20 inches in diameter or greater) to a maximum density of five per acre. Maintain 60 to 70% of ground cover on slopes 35% or less. Additionally, acceptable standards for prescribed fires should include:

- 13-foot maximum scorch height
- Less than 10% mortality in conifers > 12 inches DBH

Do not ignite fires in Steam Environmental Zones (SEZ). However, allow backing fires to enter SEZs affecting a maximum of 45% of the area in a mosaic pattern. No more than 50% of the 100-hour fuels (<3 inches diameter) should be consumed in SEZs.

The California State Fire Marshall is now certifying Professional Prescribed Fire Burn Bosses (CA-RX). New California state legislation (SB-332 and SB-926) provides liability protections and a claims fund to protect burners/landowners in case of escaped burns.

Hand Thinning and Chipping

Hand thinning and chipping is usually accomplished by a crew of persons using chainsaws and pole saws to thin and clear undesirable vegetation. Hand thinning is generally used to cut smaller trees (less than 14 inches DBH) on steep slopes where machines cannot operate, or in environmentally sensitive areas where machines would have a significant environmental impact. This is generally limited to younger stands. Because hand thinning can only effectively remove smaller material, silvicultural and fuel management objectives may be more constrained than those achieved with mechanical thinning. Therefore, hand thinning may require more frequent treatments to maintain acceptable fuel loads and may not be cost effective in forest stands with excessive ground fuel loading where mechanical thinning would remove or compact those fuels.



Figure 28: Hand thinning and chipping operation.

Used with hand thinning, piles for burning should be constructed compactly, beginning with a core of fine fuels and minimizing air spaces to facilitate complete combustion. Piles should be constructed away from trees to prevent damage when burning and be no taller than 5 feet. If broadcast burning is not scheduled for the area, then a fire line should surround each pile. Piles will be covered with a 4'x4' square of water-resistant paper to cover the fine material in the center of the piles.

Chipping

Chipping may be used as an alternative to burning. It redistributes forest vegetation that is cut by mechanical thinning or hand thinning. The chips may be removed from the site and converted to energy for other products, or they can be scattered throughout the project area.

Grazing

Use of goats, sheep, horses or cows to reduce the small fuels such as grass and small brush.

Cost Estimates

Cost estimates developed as part of this planning effort are based on data for similar work in the Truckee area, El Dorado County and Sierra County. Cost estimates vary widely because of fuel loadings, operational constraints and crew capabilities. The costs are limited to the direct cost of project implementation.

Administrative costs are approximately 25% of the total project cost, so the administrative cost for a \$100,000 project would be an additional \$25,000. Administrative costs include environmental documentation, financial administration, project layout and contract administration. These administrative costs can vary depending on community involvement and the type of CEQA or NEPA requirements.

The costs in the table below **do not include** offsetting revenue that may be generated by providing commercial products, **costs associated with project planning or preparation of environmental compliance reports, disposal fees or administrative overhead** incurred during implementation. They include only treatment costs. As noted above, plan on an additional 25% for administrative costs.

Treatment Costs based on current treatment only costs

Fuel Reduction Treatment	Cost per acre
Mechanical thinning (urban interface)	\$1,000 - \$3,200
Mastication	\$700 - \$1,500
Prescribed burning	\$400 - \$900
Hand thin and Chip	\$1,350 - \$2,300
Pile Burn	\$300 - \$700
Machine Pile	\$185 - \$275

Table 5

Appendix D: Consistency With County, State and Federal Guidelines

In addition to local research and guidance, the Olympic Valley CWPP draws on information outlined in multiple county, state and federal reports that should be referenced with this plan. CAL FIRE provides with several “big picture” documents that are important to understanding the Olympic Valley CWPP.

1. California Department of Forestry and Fire Protection, Strategic Plan 2019
<https://www.fire.ca.gov/media/bo2fdzfs/strategicplan2019-final.pdf>
2. 2020 Unit Strategic Fire Plan Nevada Yuba Placer Unit
<https://www.fire.ca.gov/media/z5lhvsd4/2020-nevada-yuba-placer-unit-fire-plan.pdf>

CAL FIRE Nevada Yuba Placer Ranger Unit

CAL FIRE Nevada Yuba Placer Ranger Unit’s (NEU) most recent fire plan is from May 2020 and contains the following priorities and goals:

Priorities:

1. Reduce the risks to citizens and emergency responders from wildland fire.
2. Develop a “land stewardship” ethic in the residents of the Unit.

Goals:

1. Demonstrate methods that individuals and the community can use to properly manage their lands to improve forest resiliency and reduce the ignitability of structures in the Wildland Urban Interface.
2. Raise citizen and stakeholder awareness of fire risks and enlist their help and participation in risk reduction.
3. Assist local government in developing standards, policies and plans, which will result in local and landscape level fuel modifications.
4. Implement local and landscape level projects and programs that decrease fire risk and increase the potential for success on initial attack.

The full NEU fire plan is available at <https://www.fire.ca.gov/media/z5lhvsd4/2020-nevada-yuba-placer-unit-fire-plan.pdf>

California Forest Management Task Force

A newly formed group created by the governor, the California Forest Management Task Force makes it easier to coordinate activities between agencies and organizations. The group is made up of state, local, tribal and federal agencies and non-governmental organizations that play critical land management or permitting roles for forest management and restoration projects. This task force has the following management goals:

1. Implement the forest practices called for in the Forest Carbon Plan.
2. Double total statewide rate of forest treatment within five years, increasing treatment to 500,000 acres per year.
3. Increase new landowner agreements and memoranda of understanding, such as Good Neighbor Authority agreements, to accelerate forest restoration thinning and prescribed fire projects across jurisdictions.
4. Integrate fire prevention activities into landscape forest restoration efforts in and near Wildland Urban Interface areas.
5. Integrate the goals of the Executive Order in fish and wildlife habitat restoration programs, mitigation-related land conservation and conservation planning.
6. Build local capacity by promoting and expanding regional forestry collaboratives.

More information is available at <https://fmtf.fire.ca.gov/>

The group has created California's Wildfire and Forest Resilience Action Plan: <https://wildfiretaskforce.org/wp-content/uploads/2022/04/californiawildfireandforestresilienceactionplan.pdf>

On page 29 of the plan, the task force lists key actions regarding fuelbreaks. It is recommended that CAL FIRE assist the Board of Forestry with updating defensible space regulations with public input to meet AB 3074 (2020) regulations, including a five-foot ember resistant zone around homes. It also recommends increased defensible space, inspections to improve defensible space compliance, expansion of home hardening programs and working with the California Department of Insurance to implement the provisions outlined in SB 824 (2017).

Examples of home hardening can be found in the Wildfire Home Retrofit Guide: <http://ucanr.edu/HomeRetrofitGuide>

Federal Guidelines

The CWPP is required to be consistent with, and tiered to, the following federal acts, and policies. The two acts most associated with fuels reduction policy are:

- The 2010 Federal Land Assistance Management and Enhancement (FLAME) Act: <https://www.congress.gov/bill/111th-congress/house-bill/1404>
- The Healthy Forest Restoration Act (HFRA) of 2003: <https://www.congress.gov/bill/108th-congress/house-bill/1904>

These policies drive a national effort of collaboration between wildland fire organizations, land managers, and policymaking officials representing federal, state and local governments, tribal interests, and non-governmental organizations that will address the nation's wildfire problems.

The FLAME Act provides a framework for local and regional actions and direction with the goal of achieving safer, more efficient, cost-effective resource protection, and to develop more resilient landscapes. The act provides a roadmap for the future Cohesive Wildland Fire Management Strategy and addresses the elements requested by Congress representing the next stage in an evolving world of wildland fire management.

The HFRA builds on existing efforts to restore healthy forest conditions near communities and essential community infrastructure by authorizing expedited environmental assessment, administrative appeals and legal review for hazardous fuels projects on federal land. The act emphasizes the need for federal agencies to work collaboratively with communities in developing hazardous fuel reduction projects, and it places priority on treatment areas identified by communities themselves in a CWPP. The HFRA provides communities with a tremendous opportunity to influence where and how federal agencies implement fuel reduction projects on federal lands and how additional federal funds may be distributed for projects on nonfederal lands. A CWPP is the most effective way to take advantage of this opportunity.

Although there are differences in defense zone and threat zone distances within USFS documents, the key is that land managers, fire experts and the community work together on a project-by-project basis to collaborate and decide on appropriate application of defense and threat zone distances based on all the factors influencing fire, which include topography, fuels, climate and fire history. This allows the community to influence the Forest Service as they may impact the communities in and around Forest Service managed lands.

Appendix E: Public Meetings and Other Outreach

A meeting with Olympic Valley stakeholders was held July 3, 2021 to explain the need for a CWPP, discuss fire behavior and to give opportunities for the public to provide input. A community meeting was held virtually on October 2, 2021, and follow-up meetings were held with fire chief Allen Riley and Jessica Asher, project manager from the Public Service District. The PSD set up a website for community members to access information and documents related to the CWPP.

CWPP Project Team Contact List	
Organization / Title	Name
OVPSD/OVFD Staff	
General Manager	Mike Geary
Fire Chief	Allen Riley
Project Manager	Jessica Asher
Fire Captain	Chris De Deo
OVPSD Board Members	Dale Cox, Katy Hover-Smoot, Bill Hudson, Fred Ilfeld
Consulting Staff	
Deer Creek Resources	Zeke Lunder, Spencer Holmes
Wildland RX	Barry Callenberger
Forester	Jeff Dowling
Grant Writer/Forester	Danielle Bradfield
Firewise Council	
Council Member	Mike Carabetta
Council Member	David Stepner
Agencies	
CAL FIRE, NEU Chief	Brian Estes
CAL FIRE NEU Prevention BC	Mike Rufenacht
CAL FIRE NEU Forester	Steve Garcia
CAL FIRE BC2315 Truckee	Bryan Farrell
USFS Tahoe National Forest (TNF) Vegetation Management Officer Truckee Ranger District	Eric Patterson - Division Chief
	Joe Griffin -Battalion Chief
Placer County	Jared Deck
	Brandon Thurber
	Shawna Pratt
Placer County Supervisor's Office	Cindy Gustafson
	Sophie Fox
	Lindsay Romack
CalTrans	Al Reed, Assistant Permit Engineer

Large Land Owners	
Placer County Parks	Andy Fisher
	Ted Rel
	Casey Lyons
Alterra Mountain Resort	Bryan Elliott
	JP Testwuide
	Mike Martin
	Michel Gross
Resort at Squaw Creek	David Lockhard, General Manager
	Stephen Benedict, Director of Engineering
	Drew Conly
Washoe Tribe	Helen Fillmore
	Rob Beltramo
	Ken Quiner
	John Warpeha
	Rhiana Jones
	James Gatzke
Poulsen	Eric Poulsen
Mancuso	
Squaw Creek Resort Homesites	David Wiener
	Peter Rexer
Local Peer Agencies	
North Tahoe Fire, DC	Steve McNamara
Truckee Fire, Forester	Jeff Dowling
Northstar Fire, Forester	Joe Barron
North Lake Tahoe Fire, Chief	Ryan Sommers
Community Members	
Licensed timber operator, Forestry contractor	David Mercer
Community Member	Jean Lange

Table 6: CWPP Project Team Contact List

Olympic Valley Fire Department Information

Source: https://www.ovpsd.org/sites/default/files/documents/Your_OVFD.pdf

Fire Department Overview

The Olympic Valley Fire Department has been serving the Olympic Valley Community since 1960. Our boundaries cover approximately 10 square miles, surrounded by State and Federal lands. The Olympic Valley Fire Department operates under the Olympic Valley Public Service District. The Public Service District is a Special District governed by an elected Board of Directors. The Fire Department is managed by the Fire Chief.

The community of Olympic Valley is home to one of the largest ski resorts in North America and home to the 1960 Winter Olympics. During peak seasons, the population at Olympic Valley can grow to more than 20,000 people. As an all risk fire department, we seek to accomplish our mission by providing fire prevention and suppression, rescue, and emergency medical services. In addition to these services, the Olympic Valley Fire Department provides public education such as First Aid/CPR classes and fire extinguisher training.

The District is protected by two fire stations. Station 21 is located at 305 Olympic Valley Road and Station 22 is located at 1810 Olympic Valley Road. The firefighters at Station 21 staff several types of fire apparatus. Engine 21 responds to structure fires, rescues, vehicle accidents, and medical aids. The engine has a full complement of firefighting equipment, rescue equipment, vehicle extrication equipment, and advanced life support equipment. The advanced life support equipment includes medications, IV access supplies, intubation equipment and a heart monitor that has the ability to defibrillate. Other apparatus includes a second Type I Structural Engine, two (2) Type III Brush Engines, a 2,150-gallon Water Tender, a Light Duty Rescue and a small off-road UTV.

Station 21 is staffed with well trained, dedicated, caring personnel 24 hours a day, 365 days a year. Station 22 is staffed on busy peak days and holidays. All personnel are professional firefighters with extensive medical training. Each shift consists of a captain, an engineer, and two firefighter-paramedics. In addition to the shift personnel, the Department is also staffed with six part-time firefighters and a full-time Fire Chief.

Geographic Overview

Olympic Valley is a glacial valley with a large meadow surrounded by a large granite cirque to the west and forested slopes on the north and south. The Valley floor is mostly a large meadow, including an 18-hole golf course, and a large paved parking lot for the ski area on the west end. A creek runs west to east through the meadow and empties into the Truckee River.

Defensible Space Program

The Olympic Valley community is located in a fire-dependent ecosystem. Forest fires over thousands of years in the Sierra Nevada have shaped the local forest in its structure and composition. Natural fires caused by lightning as well as fires set deliberately by Native Americans for travel, food, and supplies have molded the forest in this region before the settlement era started. These low-intensity and frequent fires occurred generally less than every twenty years and removed accumulated forest fuels. Early accounts from the first settlers spoke about a forest that was predominately an open-growth pine forest with large trees and little or no understory. The general absence of forest fires due to suppression efforts, infrequency of controlled burning, and changes in forest management has allowed the forest to evolve into an unnatural state. We now live in a forest that is overstocked with a larger species of white and red fir and a dense understory of seedlings, brush, and downed woody material.

Despite our efforts to keep our community fire safe, we cannot do the job alone. A defensible space is the most important factor in limiting the spread of wildfire in Olympic Valley neighborhoods. Defensible space is beneficial in many ways. It prevents fire from advancing and endangering homes and lives. It improves property value while reducing the risk of loss. It provides a healthier environment for trees and shrubs by minimizing the impacts of competition, insects, and disease. Lastly, it allows firefighters to safely and effectively defend your home from an oncoming fire. To ensure Olympic Valley homeowners are dedicated to the goal of making our community a healthier and safer environment, we remind all homeowners to maintain their property in compliance with Public Resource Code 4291.

Insurance Services Organization

The Olympic Valley Fire Department is proud to inform its homeowners, business owners, and visitors that we were recently designated with an ISO rating of 2/2Y. This rating puts us in the top 10% in the nation. The ISO rating of a community has a direct effect on the insurance premiums that individuals pay on their homes and commercial buildings (The lower the ISO ratings on a scale of 1 to 10, the better the insurance rates.) Class 1 represents exemplary fire protection, and Class 10 indicates that the area's fire suppression program does not meet ISO's minimum criteria. Virtually all U.S. insurers of homes and business property use ISO's Public Protection Classification (PPC) in calculating premiums. In general, the price of fire insurance in a community with a good PPC is substantially lower than in a community with a poor PPC, assuming all other factors are equal. A Community's PPC depends on:

- **Fire Alarm and Communications Systems:** telephone systems and lines, staffing, and dispatching systems (10% of the overall rating).
- **Fire Department:** pumping capabilities, hours of training provided and attended by staff, responses per call, commercial fire pre-planning, number of fire stations, boundaries served, hose, and pump testing (50% of the overall rating).
- **Water Supply System:** amount of available water available to suppress fires; the distribution system; and the condition of fire hydrants (40% of the overall rating).

We are proud to have achieved a Class 2 rating for our homeowners and businesses. Class 2 is an exemplary ISO rating for a fire department of our size. This rating is a confirmation that the Olympic Valley Fire Department has kept pace with the demands of the community we protect. Everyone who lives and works in Olympic Valley can be confident knowing that their Fire Department is proficient having earned this highly endorsed rating. Olympic Valley is also a recognized NFPA Firewise Community.

For more information about ISO ratings, visit the website www.isomitigation.com.

Olympic Valley's Water System

The Olympic Valley Public Service District (PSD) provides a water system of exceptional capacity and capability. The PSD is responsible for the operations and maintenance of our water systems. Over the years, Olympic Valley and Tahoe-Truckee areas have grown considerably. Along with this growth, water system technology has continued to improve. The rapidly changing community, improved technology, and a progressive District Board have combined to provide the excellent water system that exists today.

Olympic Valley's water comes from a robust well-system on the valley floor as well as a few mountain springs located on the valley's flanking hillsides.

The District has a total of 199 hydrants, most of which are within 300 feet of each other.

The combination of ample water storage, high water pressure, and the commitment of our Utility Operations Department provides Olympic Valley with an exceptional water system for fire suppression. The water system always meets or exceeds NFPA standards for storage, flow and pressure.

Olympic Valley Fire Department Capability

Administrative Address	305 Olympic Valley Road, Olympic Valley, CA 96146		
Primary Service Area	Map		
Primary Service Population	Approximately 1366 residents / 500,000+ visitors annually		
Number of Habitable Structures	Homes 900	Commercial 73	
FY2023 Adopted Budget	\$4,098,299		
Emergency Medical Service	Ambulances (Automatic Aid) 10 full time paramedics and 2 seasonal medics		
SERVICES PROVIDED:	All Risk Fire/EMS		
Specific Services (Yes or No)	Self	Contract	Contractor
1. Dispatch		X	Grass Valley Emergency Command Center (CAL FIRE)
2. Fire Suppression	X		
3. Basic Rescue	X		
4. Advanced Rescue	X		
5. Vegetation Mgmt.	X		
6. Fire Code Permit/Enforcement	X		
7. HazMat Response	X		
8. Construction Plan Check	X		
9. Fire Investigation	X		
10. Prevention/Community Outreach/Defensible Space inspections	X		

Fire Stations: Full or Part Time	EMS and Suppression Equip.	Equipment Call No.	Location
Administrative Offices	Admin	21	305 Olympic Valley Road
Satellite Station	Seasonal	22	1810 Olympic Valley Road
Personnel: Paid Staff: Reserve - Volunteers:	Number 13 full time 3 seasonal volunteers	Position FF/medics & EMTs	Station 21 305 Olympic Valley Road
Support Vehicles	2 – Type 1 2 – Type 3 1 – Lt Rescue 1 – Water Tender 1 – UTV 1 – Utility 1 – Command	E21, E221, B21, B22, R21, WT21, Ranger21, U21, C200	First out ALS – E21 and R21 The rest BLS all at 305 Olympic Valley Rd. R21 to 1810 Olympic Valley Rd. during seasonal staffing

SERVICE PROFILE:	All Risk		
Service Calls (CY 2020)*	507	Average Response Time	4:49
Structure Fire	11		
Wildland Fire	8		
EMS/Rescue	252		
Hazardous Conditions	12		
Service Call	39		
Estimated Number of Defensible Space Inspections	910	Number of violations reported: 25	
Insurance Service Office Class Rating: 2 in most water supplied areas and 2Y in the rural and semi-rural areas that lack a hydrant system. (1 being the best and 10 the worst)			
Olympic Valley	2		
River Corridor (State Route 89)	2Y		

Table 7: Olympic Valley Fire Department Capability

The following are response times and capabilities of the local wildland fire agencies, CAL FIRE and the U.S. Forest Service. Important to remember that these are not dedicated Olympic Valley units and may be unavailable if assigned to another incident.

CAL FIRE Wildland Capabilities

Resource (Hand crew, engine, aircraft, etc.)	Type	Location	Travel Time to Olympic Valley	Number of persons
Engine 2374	III	Truckee	15 minutes	3-4
Engine 2361	III	Truckee	15 minutes	3-4
Engine 2380	III	Carnelian Bay		3-4
Engine 2381	III	Truckee		Reserve
Air Tactical	OV-10A	Grass Valley	20 minutes	2
Tanker	S2-T	Grass Valley	20 minutes	
Tanker	S2-T	Grass Valley	20 minutes	

Table 8: CAL FIRE Wildland Capabilities

U.S. Forest Service Wildland Capabilities

Resource (Hand crew, engine, aircraft, etc.)	Type	Location	Travel Time to Olympic Valley	Number of persons
Helicopter	II	White Cloud	15 minutes	5-10
Helicopter	I	Truckee	10 min	1
Hotshot Crew	I	Hobart Work Center	15 minutes	20
Engine	III	Truckee	15 minutes	5
Engine	III	Truckee	15 minutes	5
Engine	III	Stampede		5
Engine	III	Big Bend		5
Engine	III	Sierraville		5

Table 9: U.S. Forest Service Wildland Capabilities

Appendix G: Framework for Monitoring and Evaluating a CWPP

The following table is a framework that can help a community in monitoring and evaluating its CWPP. The table lists six CWPP goals and a series of questions to help communities monitor and evaluate accomplishments, challenges, and how well goals have been met.

Source: https://www.forestsandrangelands.gov/documents/resources/communities/CWPP_Report_Aug2008.pdf

1. Partnerships and Collaboration	1.1 Who has been involved with CWPP development and implementation? How have relationships grown or changed through implementation? What resources did they bring to the table?
	1.2 Have partners involved in the planning process remained engaged in implementation? Have new partners become involved? How have the relationships established through the CWPP enhanced opportunities to address CWPP goals?
	1.3 How has the collaborative process assisted in implementing the CWPP and building capacity for the community to reduce wildfire risk?
	1.4 Has CWPP collaboration made a difference or had a positive impact on local organizations, neighborhoods and/or actions?
2. Risk Assessment	2.1 How has population growth/change and development in your community affected wildfire risk?
	2.2 Are there new or updated data sources that may change the risk assessment and influence fuels priorities?
	2.3 Has the community enacted a wildfire-related ordinance? If so, county, state, or local?
	2.4 Has the community enforced local or CPR 4291 ordinances?
3. Reducing Hazardous Fuels	3.1 How many acres have been treated for hazardous fuels reduction on public and private land that were identified as high-priority projects in the CWPP? What percentage of total acres treated does this constitute?
	3.2 How many fuels reduction projects have spanned ownership boundaries to include public and private land?
	3.3 What is the number and percent of residents that have participated in projects and completed defensible space on their land?
	3.4 How many hazardous fuels reduction projects have been implemented in connection with a forest restoration project?
	3.5 Economic development resulting from fuels reduction How many local jobs have resulted because of fuels reduction or restoration activities?

	3.6 Evaluate any CWPP fuels treatment utilized during suppression for effectiveness?
4. Reducing Structural Ignitability	4.1 What kind of resource losses (homes, property, infra-structure, etc.) have occurred from wildfires?
	4.2 Are the current codes and regulations for wildfire hazard adequate? If not, are there efforts to change or update them? Are there action items in the CWPP to develop codes and recommendations?
	4.3 Has the public knowledge and understanding about structural ignitability been increased by strategies adopted in the CWPP? Have homeowners been educated on how to reduce home ignitability, and are they replacing flammable building components with non-flammable materials?
	4.4 How many Firewise Communities have been recognized? How many citizens, neighborhoods, or communities have taken action to increase the resilience of their structure to fire?
	4.5 How has the availability and capacity of local fire agencies to respond to wildland and structural fires improved or changed since the CWPP was developed?
5. Education and Outreach	5.1 What kind of public involvement has the CWPP fostered? Examples include public education, household visits, demonstration projects, etc.
	5.2 Has a change in public awareness about wildfire resulted from the plan?
	5.3 What kinds of activities have citizens taken to reduce wildfire risk?
6. Emergency Management	6.1 Is the CWPP integrated within the county or municipal Emergency Operations Plan?
	6.2 Does the CWPP include an evacuation plan? If yes, has it been tested or implemented since the CWPP adoption?
	6.3 Is the CWPP aligned with other hazard mitigation plans or efforts?
	6.4 Is the Evacuation Website operational and has it been updated with new information?

Table 10: Monitoring and Evaluating a CWPP