

COMMUNITY WILDFIRE PROTECTION PLAN FOR THE CALIFORNIA PORTION OF THE LAKE TAHOE BASIN



Prepared for:

Tahoe Basin Fire Safe Council
Fallen Leaf Fire Department
Lake Valley Fire Protection District
Meeks Bay Fire Protection District
North Tahoe Fire Protection District

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I. EXECUTIVE SUMMARY

The Lake Tahoe Basin is at risk of wildfire. Significant wildfire hazards exist in and around communities in the Tahoe Basin. This plan attempts to identify those hazards and proposes fuel reduction projects for their mitigation.

Four fire districts on the California side of the Lake Tahoe Basin are included in this plan. They are: Fallen Leaf Fire Department, Lake Valley Fire Protection District, Meeks Bay Fire Protection District, and North Tahoe Fire Protection District. Districts were divided into neighborhoods and communities for assessment and mitigation project development purposes.

In 2000, the Lake Tahoe Basin Watershed assessment quantified and assessed the wildfire threat to watersheds in the Tahoe Basin. Fuels analysis, ignition history, and fire behavior modeling was used to predict fire occurrence in the basin. Urban, erosion hazard, and old forest values were assessed by watershed to determine their risk to wildfire.

Field surveys were conducted to collect community and project specific information. Detailed fire behavior analysis, structural assessment, and community design assessments, were conducted to rate communities. Mitigation projects were developed around hazardous community areas. Mitigation projects were prioritized by reviewing field based hazard information, data from the Watershed Assessment, input from the public and input from the local fire chief.

Results of the field assessment indicated a majority of homes and structures in the Tahoe Basin lacked non-flammable building materials, fire safe construction techniques, and the state mandated 30 foot zone of defensible space. Fire behavior analysis conducted on sample points located within the communities found fire would reach the canopy of the forest 80% of the time. Wildfire hazards to the communities were significant from high fuel loadings within and around the communities.

Residents and landowners need to mitigate the hazards around homes by using non-flammable building materials and creating effective defensible space. California Public Resources Code requires homeowners to address wildfire hazards. The Living with Fire in the Lake Tahoe Basin education materials provide detailed instructions to homeowners on addressing the hazards identified in this study.

Around the communities, approximately 80 wildfire fuels mitigation projects were identified across the four fire districts. For each project, specific vegetation prescriptions were developed and treatment methods to achieve those vegetation prescriptions identified. Cost estimates were associated with each of the mitigation projects.

On the California side of the Tahoe Basin, a total of 18,356 acres is proposed for treatment across multiple land ownerships. The cost for treating these acres is estimated to be approximately \$40 million.

Fire District	Landowner						Total Acres
	LTBMU by Fire District	Future LTBMU	California State Parks	California Tahoe Conservancy	Local Agency	Private	
Fallen Leaf	300	343	0	2	1	250	896
Lake Valley	1,601	4,750	104	632	56	2,107	9,250
Meeks Bay	89	700	179	41	13	685	1,707
North Tahoe	555	1,432	387	721	198	3,210	6,503
Total	2,545	7,225	670	1,396	268	6,252	18,356

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II. INTRODUCTION

At the Lake Tahoe Healthy Forest Restoration Act/Wildfire Prevention Summit on March 13, 2004, fire officials from the Fallen Leaf Fire Department, Lake Valley Fire Protection District, Meeks Bay Fire Protection District, and North Tahoe Fire Protection Districts (Districts) accepted the challenge to develop community wildfire protection plans. This report describes those community wildfire protection plans.

This document is intended to provide district wide planning level information for identification of wildfire hazards and proposed fuel mitigation projects to address those hazards. It is not intended to circumvent the public review process for vegetation management treatments or address the environmental compliance measures necessary for each project. NEPA and CEQA compliance for fuel mitigation projects will be addressed with detailed project planning to be completed prior to implementation of each project. This plan is advisory and will not result in changes in the human environment without appropriate environmental planning, therefore is not subject to NEPA or CEQA.

Wildfire hazards addressed in this plan are located in the Wildland Urban Interface (WUI). This zone is commonly described as the area where structures and human development are adjacent to or within undeveloped wildland vegetative fuels. Some federal and state definitions have included ¼ mile as the distance into the wildland from the community that is considered the WUI. The interface zone can be expanded in cases where fuels, weather, and topographic conditions pose threats to the community beyond the standard ¼ distance.

1. Project Location

The Districts are in the California portion of the Lake Tahoe Basin (Figure 1). The Lake Valley Fire Protection District is in the southern–most area of the Basin, covering seven communities. The Fallen Leaf Fire Department included three communities. Meeks Bay Fire Protection District is on the west shore of the Lake, covering seven communities from Emerald Bay toTahoma. The North Tahoe Fire Protection District covers 7 communities from Homewood on the west shore to Brockway on the north shore.

2. Purpose

Community wildfire protection plans assist communities in defining priorities for the protection of assets in the wildland urban interface (Healthy Forest Restoration Act 2003). The community wildfire protection plans described here will:

- ensure that local efforts respond to and collaborate with federal, state, and regional direction and efforts;
- identify wildfire fuel treatments;
- prioritize treatments; and,
- contribute to the conservation of the Lake Tahoe Basin’s human, natural, and economic assets.

Ultimately, these plans will be integrated with similar plans completed for communities on the Nevada side of the Lake Tahoe Basin to create a Basin-wide fuels treatment plan.

3. Need

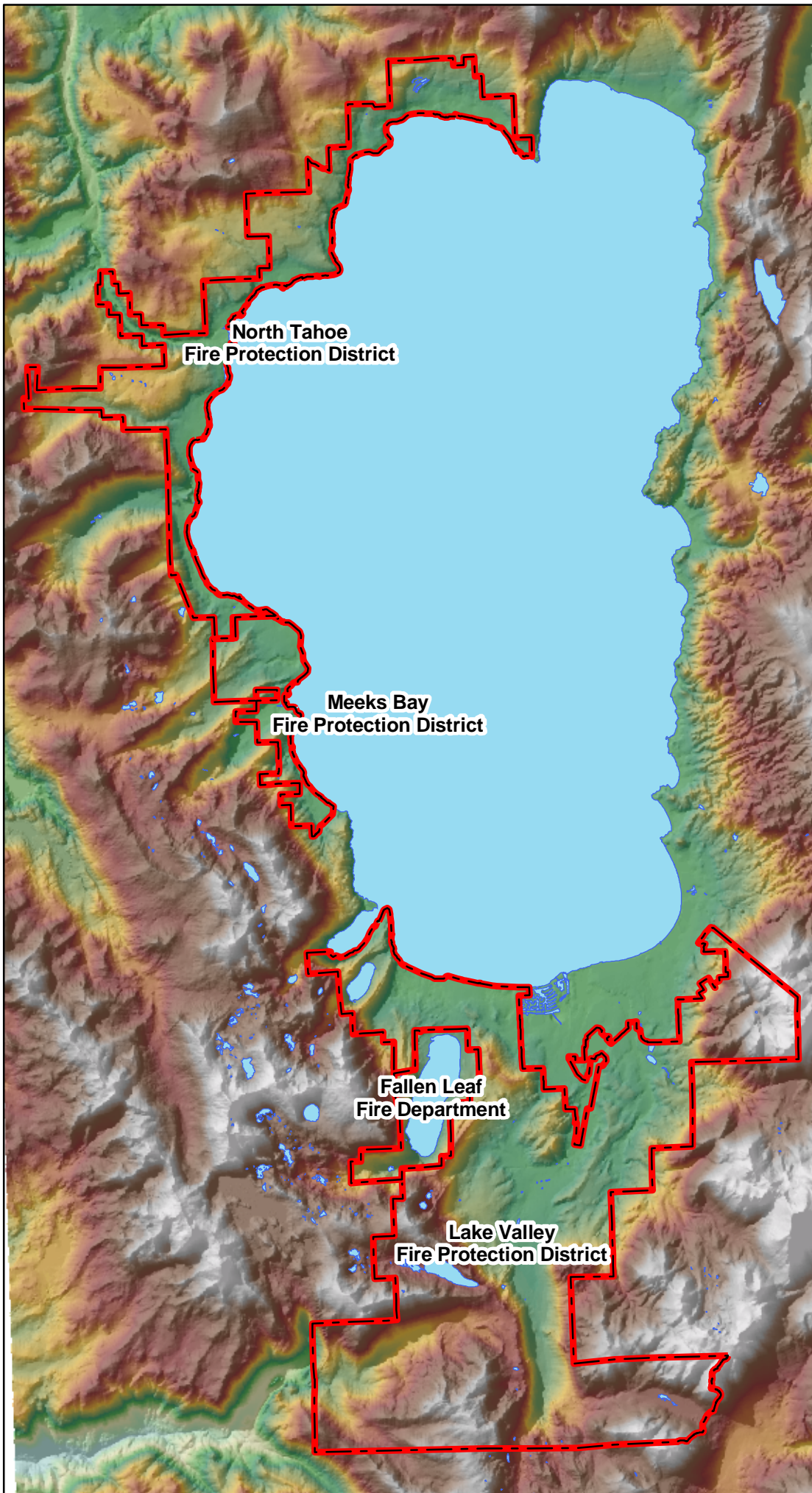
Between 1875 and 1895, large-scale timber harvesting removed most of the large, widely spaced trees along the west side of the Basin (Murphy and Knopp 2000). Although the forest stands successfully regenerated, 55 years of effective fire suppression and a reduced emphasis in forest management on public lands have resulted in denser forest stands than occurred historically. Recent estimates indicate that in the Basin lower montane forests have four times the density of trees and upper montane forests have twice the density of trees when compared to forest conditions prior to 1870. Current forest stands exhibit a 70% higher disease incidence and a 5% greater mortality than remnant old growth stands in the Basin (Murphy and Knopp 2000).

Fuel hazards in the Basin have changed along with forest management practices. High rates of tree mortality, particularly white fir (*Abies concolor*), have increased the number of standing dead trees and downed logs. The lack of frequent low intensity fires has resulted in accumulations of dead fuels and increased understory shrubs. As a result, flame lengths and rates of fire spread lead to higher intensity fires. The mid-story trees in these stands create fuel ladders that allow fires to readily move into dense crowns that facilitate the movement of fire from one tree crown to another. This can result in a crown fire and a stand-destroying incident.

Recent estimates indicate that if a fire escaped initial control, at least 50% of the burned area would probably occur as a crown fire, with overstory tree mortality exceeding 50%. Locations that exhibit pronounced levels of drought-, insect-, and pathogen-related mortality would increase fire line construction times and reduce suppression effectiveness (Murphy and Knopp 2000). Few large fires have been recorded in the Tahoe Basin over the past 80 years. However, two recent fires – the Gondola and Showers fires – were sizable and occurred under less than extreme fire weather conditions. As such, these fires provide evidence that fuel hazards are pronounced and have increased substantially.

The unique qualities of Lake Tahoe have been described in fictional, non-fictional, and scientific publications. The lake's clarity and size are world-renowned. The wide range of recreational opportunities support a \$1 billion local economy and over 40,000 residences (many valued at over \$1 million) provide homes to a year-around population of over 57,000 people and substantially higher number of seasonal visitors (Murphy and Knopp 2000). As a result, even a small wildland fire may have significant impacts on the Basin's assets.


**Figure 1.
Fire Districts
in the Lake Tahoe Basin**



Legend

 Fire District

0 2.5 5 Miles

A horizontal scale bar with three segments. The first segment is labeled '0', the second '2.5', and the third '5'. The word 'Miles' is at the right end.

Geoarch Sciences has made every effort to accurately compile the information depicted this map, but cannot warrant the reliability or completeness of the source data.

4. Recent Policy Changes

In response to the devastating fires in 2000, 2001, and 2003, national, state, and local policies have focused efforts on reducing the threat of wildfires, particularly in the wildland urban interface. The National Fire Plan provided direction, allowing for the identification of communities at risk. Eight communities in the California portion of the Basin have been designated as communities-at-risk: City of South Lake Tahoe, Homewood, Tahoe Pines, Sunnyside-Tahoe City, Dollar Point, Carnelian Bay, Tahoe Vista, and Kings Beach (Federal Register 66[160]: 43384-43435).

In June of 2004, TRPA passed a resolution (number 2004-15) in support of the Community Wildfire Protection Planning effort. Specifically, TRPA agreed to support:

- Promotion of biomass utilization;
- Assist fire districts within the Lake Tahoe region to develop MOUs for defensible space advice and permitting;
- Assist the fire safe councils to develop community fire plans; and
- Assist in securing funding for those plans.

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

- authorized fuel reduction projects on federal lands in the wildland urban interface;
- required federal agencies to consider recommendations made by at-risk- communities that have developed community wildfire protection plans; and,
- gave funding priority to communities that have adopted wildfire protection plans.

The USDA Forest Service amended the Sierra Nevada's Forest Plans, including the Lake Tahoe Basin Management Unit's (LTBMU), to emphasize the reduction of hazardous fuels in the wildland urban interface (January 2004). The plan adopted a regional goal, stating that 50% of all initial treatment should occur in the wildland urban interface. The amendment prohibited the removal of trees greater than 30 inches dbh and effectively conserved all trees greater than 25 inches dbh.

California Public Resources Code 4291 (PRC 4291) requires homeowners to address wildland fire hazards through creation of defensible space and other building construction mitigation measures. Specifically, the code requires homeowners to:

- Maintain adequate defensible space 30 feet around structures (this will increase to 100 feet January 1, 2005)
- Remove that portion of any tree which extends within 10 feet of the outlet of any chimney or stovepipe.
- Maintain any tree adjacent to or overhanging any building free of dead or dying wood.
- Maintain the roof of any structure free of leaves, needles, or other dead vegetative growth.
- Provide and maintain at all times a screen over the outlet of every chimney or stovepipe that is attached to any fireplace, stove, or other device that burns any solid

or liquid fuel. The screen shall be constructed of nonflammable material with openings of not more than one-half inch in size.

Though PRC 4291 has been available for many years, its enforcement has been limited to non-existent. Challenges to the enforcement include the amount of documentation necessary versus the amount of the fines. A number of notices are required before a fine can be levied, and the first fine cannot exceed \$500. Typically the cost of completing appropriate fuels reduction work around the home is well in excess of the fine. Multiple violations of the law can increase the fines, but not necessarily address the hazardous situation by removing the fuels.

In response to these concerns, some counties and fire protection districts have adopted their own ordinances that increase the defensible space zone and provide for methods of enforcement. Enforcement methods include not only citing landowners but also creating the defensible space around the home. With either fire service staff or contracted labor, the hazard is abated and a bill is sent to the landowner. Nonpayment results in a lien on the property. Some counties in southern California have had limited success with such ordinances since the fires in 2003, but enforcement in counties near the Tahoe area has not been accomplished.

The California Public Resources Code was recently amended to increase the defensible space zone around structures from 30 feet to 100 feet. It is unlikely to have a significant effect since enforcement did not even occur with the 30 foot zone.

An additional challenge to mitigating hazards has been the California Forest Practice rules. These codes are designed to regulate commercial timber harvests, but definitions of commercial harvests within the codes typically included trees that needed to be removed for wildfire or other hazard reduction purposes. To address this issue, the California Department of Forestry and Fire Protection passed an emergency fuel hazard reduction rule (June 2004) to address private lands. Under those rules emergency conditions include:

- trees that are dead or dying from insects, disease, parasites, or animal damage;
- trees that have fallen or are damaged as a result of weather conditions, fires, floods, or earthquakes;
- trees that are dead as a result of pollution; or,
- where high, very high, or extreme fuel hazard conditions pose a threat to private timberlands.

With the changes to the rules, environmental compliance measures are more efficient to quickly mitigate hazards within communities. While this adjustment has been useful across the state, it has not been widely used in the Tahoe Basin due to regulations by other agencies that supercede the Forest Practice rules. Even though commercial harvest permits may not be necessary at the state level, the Regional Water Quality Control Board – Lahontan Region (Lahontan) and Tahoe Regional Planning Agency may require additional permits and waivers to remove trees on private lands.

5. Methodology

Reports, policies, and regulations governing forest, fire, and fuels management in the Lake Tahoe Basin were reviewed. Geographic information system (GIS) databases describing land ownership, land use, and resources were obtained from TRPA and LTBMU. These databases were used to plan and evaluate fire risks and hazards, projects completed or proposed by other agencies, and develop projects for the community wildfire protection plans.

Representatives from each fire district and land management and regulatory agency were interviewed to identify issues, and opportunities. Additionally, an agency workshop was held November 3, 2004 in Lake Valley. Four public workshops were held: Meeks Bay (September 27, for MBFPD and NTFPD), Lake Valley, Meyers (September 28, for Lake Valley FPD and Fallen Leaf Fire Department), Tahoe City (November 16, for MBFPD and NTFPD), and Lake Valley, Meyers (November 17, for Lake Valley FPD and Fallen Leaf Fire Department).

5.1 Field Surveys

Thirty-nine sampling points were installed in the four districts to estimate fire behavior. The sampling points were installed within proposed project areas and are representative of fuel hazards in those areas. The objective of the sampling points was to provide a site-specific evaluation of fuel hazards, evaluate those hazards based on information provided in the Lake Tahoe Watershed Assessment (Murphy and Knopp 2000), and document pre-treatment conditions for use during future monitoring. The sample sites are intended to represent unique fuel types within each district or community. Several photo series booklets developed by the US Forest Service created for use to assess fuel hazard loadings were used in conducting assessments of fire hazard across the range of the California Lake Tahoe Basin wildland fuel types.

At each sample point in the community, surface and canopy fuels data were collected. A photo with reference marker was taken of each plot site, and additional photos (to the north, east, south, and west of the plot) were taken to capture a complete characterization of the fuels within each plot.

For each sample site the following information was collected:

- The Forest Service Photo Series was used to determine the surface fuel loading.
- The surface fuel model was determined based on expected fire behavior from the 13 National Fire Behavior Prediction System (NFBS) models (Anderson, NFFL, 1982).
- A 1/40th of an acre plot was established centered on the photo stake, and species, height, percent canopy, and DBH were recorded for all trees present. This data was entered into the CrownMass modeling program to characterize canopy fuel condition for each plot.
- The point was mapped with a 5-10m accuracy GPS so that it could be easily found again and revisited if necessary.
- An estimation of mortality was determined while at the site for comparison to the mortality estimated by the CrownMass program. We found these mortality estimates to be very similar to mortality estimates output from the computer model.

5.2 Fire Behavior Analysis

The data collected from each plot survey was then input to a series of fire behavior computer programs.

Fuels Management Analyst PLUS (FMAPlus) Modeling Software

The FMA Plus computer program was used to develop reports for each sample point surveyed. These reports, validated by experienced wildland fire fighters, provide a scientific basis for assessing fuel conditions in California Lake Tahoe Basin.

FMAPlus is a suite of fire behavior modeling tools that analyze field-collected fuel profile information to characterize predicted surface fire behavior and crown fire potential. FMAPlus was used to analyze data that collected during sample point analysis. These outputs are summarized as reports attached to the photos from each of our survey points in the photo series book – an example of the FMAPlus report can be found in Appendix A. Programs used in the FMAPlus suite included the ‘Photo Series Explorer’, ‘Down Dead Woody (DDWoodyPC)’ and ‘Crown Mass’ modules.

Photo Series Explorer

This program was used to develop fuel profiles for the sample points in the communities.

DDWoodyPC

We used this module to compare fuel loading estimates taken at our photo points to a database of other existing USFS fuel loading surveys undertaken in similar forest stands. The DDWoodyPC module calculates surface fuel loading using the Photo Series Explorer.

CrownMass

CrownMass uses inputs from field surveys, FMAPlus modules “Photo Series explorer and DDWoodyPC” along with historic USFS weather data to:

- Determine fuel loading for debris from crowns, boles, and tops.
- Determine crown mass and the stand's susceptibility to crown fires.
- Predict fire behavior in resultant fuel bed including crown fire potential.
- Predict fire effects including probability of tree mortality.
- Quickly generate sampling statistical graphs.
- Import tree information from plots taken with the photos.

Fire behavior attributes from several photos were used to portray a site. For example, the fuel loading statistics (1, 10, 100, and 1000 hr.) attached to each photo point applies only to surface (ground) fuels, and the resultant surface fire behavior. The “Crown Fuels Characterization”, “Resultant Fire Spread and Type”, and “Tree Effects” information is derived in part from a site’s canopy fuel loads. To evaluate Crown Fire potential for a site, a different reference photo that better matches the canopy fuels at the site may be used.

Important fields for use in determining Crown Fire/Tree Mortality Potential include:

- Canopy Base Height(ft)- height of lowest branches/ladder fuels
- Flame Length(ft): Critical - length of flames needed to initiate crown fire
- Fire Flame Length(ft) - predicted height of flames from surface fuels
- If 'Fire Flame Length' exceeds the 'Critical Flame Length', torching or crown fire will occur.

5.3 Weather Data used in Fire Behavior Analysis

Weather data from the Meyers weather station on the south shore was the primary source of information for analyzing fire weather. For the fire behavior analysis, weather data during the fire season is typically summarized by percentiles; 75% moderate, 90%-96% high, and 97% to 100% extreme. The weather records for Meyers station covered the longest period of time and were the easiest to use in the modeling programs.

Table 1: Weather Station Data used in Analysis

Indices	Meyers
1 Hour Fuel Moisture	7%
10 Hour Fuel Moisture	7%
100 Hour Fuel Moisture	12%
Herbaceous Fuel Moisture	30%
Woody Fuel Moisture	109%
20' Wind Speed	12 MPH
1000 Hour Fuel moisture	10%

Ninetieth percentile (high severity weather) from the Lake Tahoe Basin weather station in Meyers was used in the fire behavior analysis. Weather information from Fallen Leaf Lake, Angora Lookout, North Lake Tahoe High School and the Martis lookout were used to support the weather data that was used in the analysis. Reviewing data from the other stations, the average wind from Meyers is slightly lower than that at other weather station locations.

According to the Lake Tahoe Basin Watershed Assessment, "Fires burning under the strongest winds (from the SW, W, SE) have the greatest opportunity to become larger in the area south and north of Lake Tahoe. In these areas, topography lines up better with wind direction, and these areas contain more area with continuous fuels." Our fire behavior analysis supports these findings. Wind will likely be the difference between a controllable fire and an uncontrolled fire in the Tahoe Basin. With the predominant wind from the southwest, the southwestern portions of these communities are most at risk from extreme fire behavior, many of the proposed mitigation projects address this side of the communities.

6. Structural Assessment

Fire protection district personnel conducted an assessment of building materials and defensible space within the communities. Using sampling sheets provided by our team, fire personnel reviewed (from the street) all or some of the lots in their communities,

noting flammability of siding, roofing, and unenclosed features. They also assessed the presence of an effective 30 foot defensible space zone around the homes.

Community design was also considered. Estimates were made of the effectiveness of street signage, address numbering, and road network design. Water system infrastructure, fire department staffing, and ignition risk were considered in the overall structural assessment.

III. SECTION ONE

1. HAZARD, RISK, AND VALUE ASSESSMENT

This section describes the fuel hazards, risks, and assessment of value-at-risk in the California portion of the Lake Tahoe Basin. It provides a historical overview of factors (human use, changes in vegetation, and fire behavior) that have contributed to the current situation, describes current hazards and risks, and prioritizes property and natural resource values-at-risk. Most of the information summarizes data described in the Lake Tahoe Watershed Assessment (Murphy and Knopp 2000, Jones & Stokes et al. 1999).

Specific terms are used in this section to describe hazard, risk, and fire regimes. Fuel hazards refer to the amount of fuel available to burn. It includes surface fuels (litter, duff, and downed wood), ladder fuels (shrubs and small trees), and crown fuels (foliage in the overstory trees). Fire regimes include the return interval (period between fires) and fire intensity. Risk is the likelihood an ignition will occur. Sources of risks are either natural (lightning) or human (escaped campfires, matches, or sparks from equipment).

1.1 Fuel Hazards

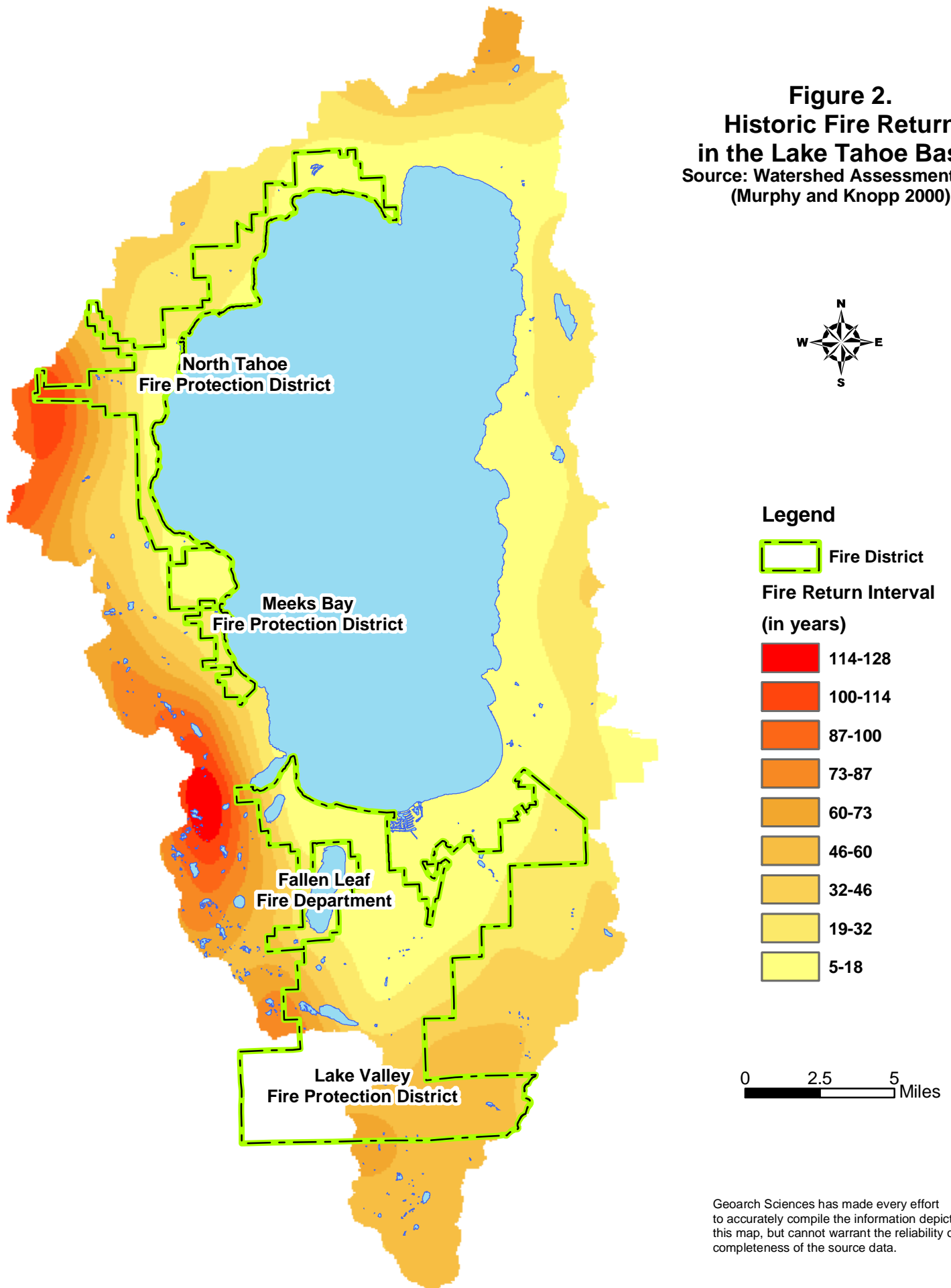
This discussion of fuel hazards includes a description of historical changes in the fire regime, fuel hazards, and the current fuel hazards and estimated fire behavior in the California portion of the Lake Tahoe Basin.

Historic Fire Regime and Fuel Hazards

Prior to European settlement, fires in the Basin were ignited by lightning or members of the Washoe tribe. Fire return intervals varied from 5-128 years throughout the Basin. However, at lower elevations where most of the Washoe camps and current communities occur, the fire return intervals were shortest. Fire return intervals averaged 5-18 years around the edge of the Lake and south to approximately Meyers. Immediately above this elevation, fire return intervals averaged 19-32 years (Figure 2). Based on fire return intervals, it is estimated 689-2,964 acres burned annually in the western portion of the Basin (Murphy and Knopp 2000).

Prior to European settlement, lower elevation montane forests were characterized by large, widely spaced trees with little understory. Because frequent fires reduced surface and ladder fuels, fire intensities were low and there was little mortality of mature trees. Fire return intervals in intermittent and ephemeral streams were probably similar to adjacent upland forest. Shrubs and small trees were widely scattered along these streams; however, dead and dying shrubs and mature lodgepole pines (*Pinus contorta*) were probably rare. Fire return intervals were longer along larger perennial streams. Fires that did occur along these streams resulted in a mosaic of age classes of riparian shrubs and trees. Mature lodgepole pines were rare or widely scattered along perennial streams. Frequent fires periodically destroyed shrubs and most lodgepole pines seedlings that regenerated in meadows. Shrubs and widely scattered mature lodgepole

Figure 2.
Historic Fire Return
in the Lake Tahoe Basin
 Source: Watershed Assessment 2000
 (Murphy and Knopp 2000)



Geoarch Sciences has made every effort to accurately compile the information depicted this map, but cannot warrant the reliability or completeness of the source data.

pinos occurred in drier areas of meadows; however, the meadows were dominated by herbaceous vegetation.

As Europeans settled in the Basin the fire regime and fuel hazards changed. The frequent fires set by the Washoe were eliminated as the Native Americans were pushed out of the Basin. Between 1875 and 1895, large-scale timber harvesting clear-cut most of the old growth forests on the west shore. Large-scale harvesting continued after this; however, it was more localized. Large numbers of livestock removed herbaceous vegetation and fires set at the end of the summer grazing season probably killed tree seedlings that were regenerating in some of the clear-cuts. By 1900 the forests in the Basin were now comprised of individual stands of seedlings, saplings (1-6 inches dbh), poles (6-12 inches dbh), small trees (12-24 inches dbh) and old growth forests. The smaller size classes of these trees would have supported more intensive fires than the old growth stands. These high fuel hazards resulted in the largest fire recorded in the Basin in 1918 (1,013 acres) and the largest number of acres burned in the Basin during the decade between 1916 and 1925 (2,593 acres) (Table 2)(Murphy and Knopp 2000).

Livestock grazing was reduced significantly by 1930, allowing vegetation to regenerate. The drought from 1929-1934 probably limited some regeneration, increased tree mortality in some stands, and increased fuel hazards in the Basin. Fewer acres burned however, because the federal government had adopted a fire exclusion policy in 1924 and few people visited the Basin during the Great Depression and World War II. Although the number of visitors to the Basin increased after World War II, the number of acres burned by wildfires remained low. Federal and local fire agencies were able to effectively suppress fire; wetter than normal year's maintained higher moisture in small fuels during dry periods; and trees in forest stands were becoming larger and less likely to be ignited (Murphy and Knopp 2000).

Current Fire Regime and Fuel Hazards

Several factors have combined to significantly change the fire regime and fuel hazards in the Basin. Since 1970s, public sentiment and management strategies increasingly emphasized the protection and preservation of natural resources. Without sources of disturbance such as fire or harvesting, forest vegetation continued to grow. As a result, there were a large number of all size classes of trees in forest stands that create a ladder of flammable vegetation from the ground to the overstory canopy. Conifer trees invaded meadows and other openings, increasing fuel loadings. Since 1975, three periods of drought increased mortality in forest and riparian vegetation. The limbs from dying trees and dead trees fell to the ground and increased surface fuels. Small trees of shade-tolerant species, such as white fir created ladder fuels in forest stands. As a result, fuel hazards may be the highest they have been in over 100 years. This is supported by the increasing number of acre burned each decade by wildfires since 1966-1975 (Table 2).

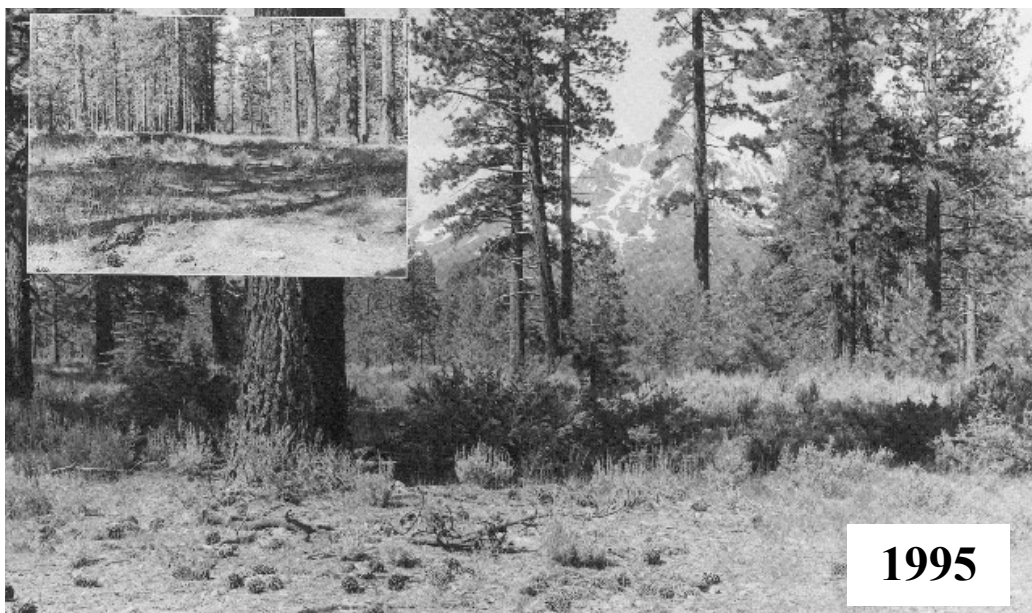
These photos from George Gruell's book "Fire in Sierra Nevada Forests: A Photographic Interpretation of Change Since 1849" (2001) illustrate this change in fuel loadings.



Note in this photo pair the change in tree density and understory fuels. Trees were so dense that the original photo location could not be recreated. The photographer had to stand in an alternate location to capture Mt. Tallac in the

background.

Fire behavior in each of these scenes is significantly different. In the photo from the 1800's, a low intensity fire would burn through the understory, leaving the majority of trees unharmed. In the photo from the 1990's high surface fuel loadings and ladder fuels would easily carry fire up the large trees, causing damage and possibly mortality.



This set of photos illustrates the change in fuel bed continuity and loadings around Fallen Leaf Lake. In the photo from the 1800's, fuel loadings are much lower (notice the rock in the foreground) and tree density is sparse enough to preclude a crown fire. In the 1990's, only the tip of the rock is visible through the brush, with a continuous bed of fuels from the ground to the tops of the trees. The canopy is completely closed, allowing a fire to easily



1873



1992

spread from the crown of one tree to another. In the older photo, a fire would leave the forest in much the same condition before and after the fire. In the newer photo, the forest would be

completely destroyed, with no vegetation to hold the soil in place.

While it is certain that fuel loadings have increased in the last 100 years, determining the exact condition of the Basin 200 or 500 years ago is difficult. The Watershed Assessment provides the best explanation based on available tree core and historic stump records. In general, fuel loadings were much lower and crown spacing much greater. Natural variability in forest structure may have included clumps of trees, which could have produced small crown fires.

The description of the historic fire regime is intended to describe how the forest reacted to fire in the recent past, and why the management objectives described later in this document attempt to achieve fire behavior similar to that of the historic fire regime. This text should not be viewed as a comprehensive scientific assessment of fire regime in the Tahoe Basin. As a public document, it is intended to illustrate that the current forest stand conditions in the Tahoe differ from historic conditions.

This understanding is necessary for the public to play an active role in defining the future conditions of the public lands in the Tahoe Basin. Recommended prescriptions seek to attain forest stand conditions found previous the European man's entry into the ecosystem. The land management prescriptions contained in this document should not be viewed as the only land management solution. Any land management scheme which results in the desired fire behavior is appropriate. This may include forest stand structures that were not previously in the basin.

1.2 Estimated Fire Behavior

An initial estimate of fire behavior in montane forests for the community wildfire protection plans was developed using standard National Forest Fire Laboratory fuel models, weather data from the Meyers station, and BEHAVE (Table 3). Estimates of fire behavior are for high fire weather conditions. Photographs from Lake Tahoe describing fuel models are provided in Section Two.

Table 3: Estimated fire behavior in the Lake Tahoe Basin.

Fuel Model	Flame Length (ft)	Rate of Spread (ft/hour)
FM 2 - Grass in moderate pine/shrub	3.5-4.5	700-1050
FM 5 - Shrub (huckleberry oak and manzanita)	5-7	880-1180
FM 8 - Sparse forest with compact fuels	1-2	50-66
FM 9 - Closed forest overstory compact understory fuels	2-3	178-250
FM 10 - Forest with moderate understory fuels	4-6	300-400
FM 12 - Forest with heavy fuels	6-7	400-520

Currently, most of the project area is best categorized using fuel models 9, 10, and 12. Given the estimated flame lengths (especially in models 10 and 12) and the presence of mid-story fuel ladders, most forest stands are highly susceptible to crown fires. Projected rates of spread in models 10 and 12 are also considered high. Fire behavior estimated at 39 photo points in the planning area indicated 80% would result in a crown fire with extensive mortality.

The results of wildfires in montane forests under very high fire weather conditions were also simulated in selected watersheds (Table 4). The simulations were done with FARSITE using mapped fuel hazards and assumed the fires burned for two days without effective fire suppression (Jones & Stokes et al. 1999, Murphy and Knopp 2000). The simulated fires showed 2,243-3,653 acres were burned and the percent crown fire ranged from 13-24 percent. This represented the MINIMUM mortality that would occur. Substantially more mortality would actually occur because intensive surface fires would

kill larger number of trees. This simulated fire behavior was observed recently in the Gondola Fire (673 acres) and Showers Fire (294 acres) under weather conditions well below high fire weather conditions.

Table 4: Results of simulated fire behavior in selected watersheds in the Lake Tahoe Basin.

Watershed	Acres Burned	Percent Crown Fire
Griff Creek	2,243	24
Ward Creek	2,991	13
Trout Creek	3,653	17

Fire behavior was also estimated in a stream environment zone just north of D. L. Bliss State Park. Data were obtained during field surveys for this plan and simulations were conducted with FUELS MANAGEMENT ANALYST. The fuel hazards would result in a passive crown fire and excessive mortality.

This type of fire behavior was observed in the November 2002 Pioneer Fire. A power line initiated a surface fire, which burned in a previously treated area. Driven by strong winds, the fire reached a stream environment zone where it quickly became a crown fire when it moved up through mature lodgepole pines growing in the riparian habitat.

Differences in fire behavior modeling results between analysis conducted for this assessment and previous analysis can be attributed to two major distinctions. First, fuel modeling information was collected differently. In the FARSITE analysis, the fuel modeling layer was generalized across the watershed and used standard forest stand parameters. This fuel model data was less specific within the communities. The fuel modeling developed for this document was site specific, with detailed forest sample plot measurements to adjust fuel model parameters. These plots were located within the high hazards areas in and adjacent to communities. Second, the information reported from each analysis is different (minimum flame lengths are reported from FARSITE, average flame lengths are reported from Fuels Management Analyst.).

The current fire regime in the Basin is now characterized by high intensity fires rather than the majority of low intensity fires that previously occurred there. This change in fire behavior is supported by the increase in number of acres burned annually by wildfires, despite highly effective suppression capabilities. Additionally, simulated fire behavior in montane forests and stream environment zones is supported by observed behavior of recent fires in the Basin. High intensity fires will result in high mortality in forest stands and dependent on the size of the fire, could result in extensive property loss and large amounts of erosion and sedimentation adversely affecting water quality.

1.3 Ignition Risk

The Lake Tahoe Basin has one of the highest fire ignition rates in the Sierra Nevada. Data from the LTBMU from 1973-1996 were used to describe ignition risks. In the planning area, the highest occurrence of ignitions (number of ignitions per 1,000 acres, Figure 3) occurs at Brockway, from Kings Beach to Tahoe Vista, Dollar Point, Camp

Richardson, and around the City of South Lake Tahoe. The lowest occurrence of ignitions occurred at Homewood, Meeks Bay, and D. L. Bliss State Park. Humans caused all but one fire during this period (Murphy and Knopp 2000).

1.4 Values at Risk

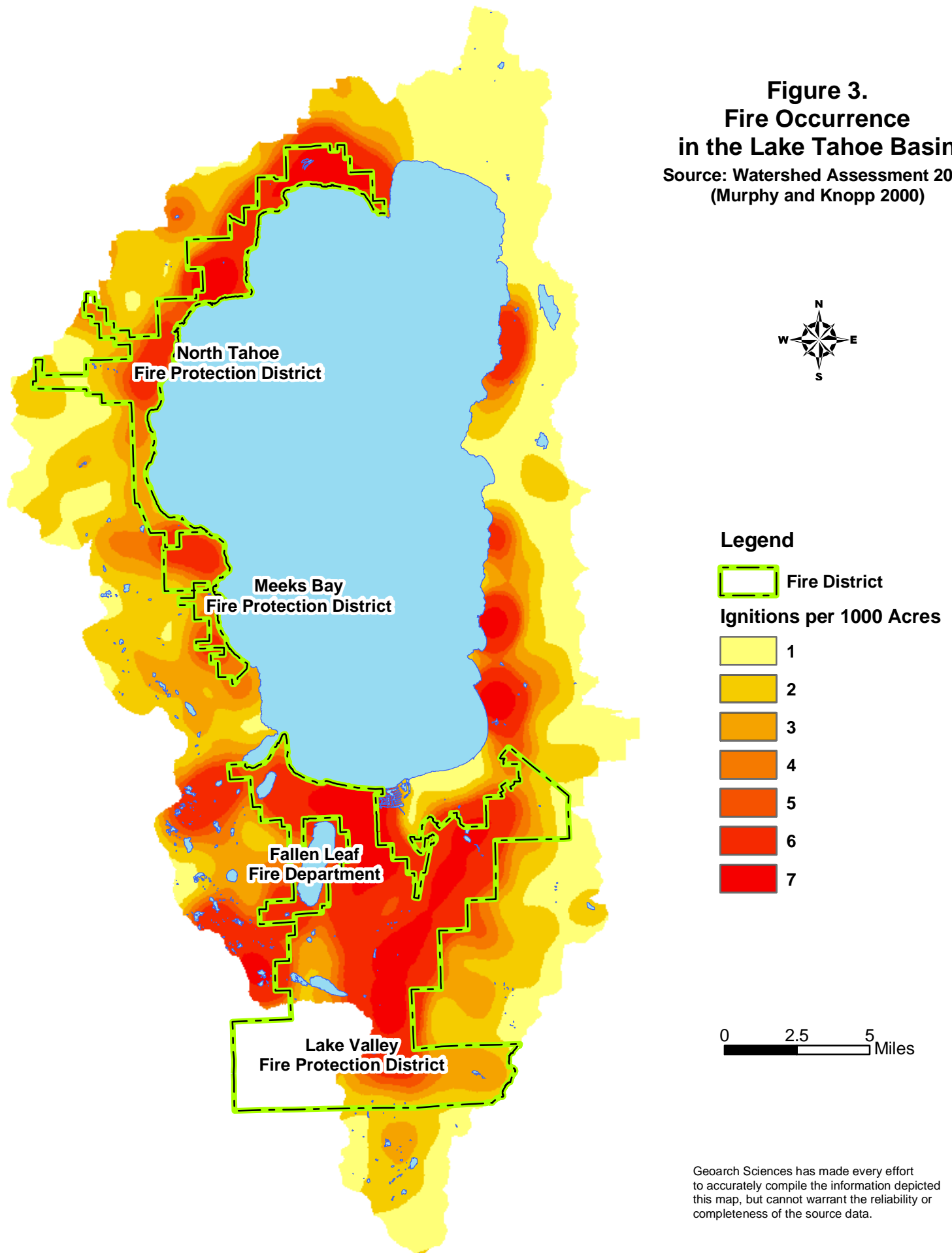
Given the diversity of people and resources in the Lake Tahoe Basin, there is a large number of real and perceived values at risk. Three values at risk are considered in this evaluation: communities, lake clarity, and old growth forests (Murphy and Knopp 2000). The economic value of individual communities varies around the lake; however, the personal value of every community is equally very important to each member of those communities. Therefore, community values were calculated as the percentage of each watershed covered by structures or developments. Soil erosion hazards in watersheds were used to characterize threats to water quality and lake clarity. Intense fires on highly erodible soils would have a greater impact on water quality and lake clarity than intense fires on less erodible soils. The percentage of old growth forests in each watershed were used as an umbrella indicator of upland biological resources.

Prioritizing Values at Risks

Values at risk were prioritized by integrating the community, lake clarity, and old growth forest indices with fire susceptibility and then ranking individual watersheds (Murphy and Knopp 2000). Wildland fire susceptibility includes simulated flame lengths, representing fire hazards, and ignition risks. Therefore, the prioritization process accounts for economic and natural resource values at risk and the susceptibility of that watershed to a fire. The communities in each fire district and the prioritization of values at risk are shown in Figure 4.

Based on this assessment of values at risk, the highest ranked communities are Brockway and portions of Kings Beach; Dollar Point, Cedar Flat, and the Highlands; portions of Tahoe City, the Truckee River corridor, and Talmont; portions of Gold Coast; and North Upper Truckee, Meyers, and Christmas Valley. This analysis is very similar to the communities at risk identified in the Federal Register.

Figure 3.
Fire Occurrence
in the Lake Tahoe Basin
 Source: Watershed Assessment 2000
 (Murphy and Knopp 2000)

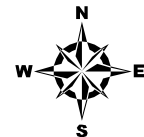


Geoarch Sciences has made every effort to accurately compile the information depicted this map, but cannot warrant the reliability or completeness of the source data.

Figure 4.
Values At Risk
in the Lake Tahoe Basin

Urban, Erosion Hazard, and
 Old Forest Values

Source: Watershed Assessment 2000
 (Murphy and Knopp 2000)

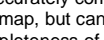
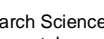
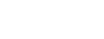


Legend

 Fire District

Watershed Value and Risk

 High



High

Low

0 2.5 5 Miles

Geoarch Sciences has made every effort
 to accurately compile the information depicted
 this map, but cannot warrant the reliability or
 completeness of the source data.

2. MITIGATION GOALS AND OBJECTIVES

The community wildfire protection plan is intended to assess wildfire hazards around communities and develop mitigation projects to address those hazards. Most mitigation projects involve some level of vegetation management, since wildland fuels are the common hazard around communities. This plan develops projects that address the wildfire hazard and, if possible, achieve land management goals and objectives.

This section describes the management goal and objectives for this set of community wildfire protection plans. Management goals are broad statements providing programmatic direction. Management objectives include numeric thresholds or desired conditions for specific components of the program.

Development of the management goal and objectives for these plans considered wildfire hazard reduction, the current characteristics of the Basin's ecosystem and direction in the Healthy Forest Restoration Act and the Water Quality Control Plan for the Lahontan Region (Basin Plan) to maintain water quality.

Many forest stands in the Tahoe Basin have high fuel loadings and are in poor health. The Basin's upland forests are characterized by high mortality, riparian areas have excessive mature, dead, or dying vegetation, and most meadows support encroaching lodgepole pines with varying levels of mortality. The forests are significantly different than they appeared prior to the Comstock era logging (Murphy and Knopp 2000). Prior to Comstock logging, forest stands were much less dense with larger trees and open understories. The current forest stand characteristics have also created excessive fuel hazards capable of supporting stand-destroying fires that threaten communities and ecosystem health.

The purpose of the Healthy Forest Restoration Act is to:

- Reduce wildfire risk to communities;
- Enhance efforts to protect watersheds and forest health; and
- Protect, restore, and enhance forest ecosystem components (H.R. 1904, section 2).

<p>The goal of the community wildfire protection plans is to protect values at risk and restore ecosystem health by reducing fuel hazards using cost effective treatments.</p>

Objectives are described by vegetation types in the planning area. Vegetation types were selected because they are easily identified; historic fire regimes and vegetation composition and structure differ among vegetation types; several vegetation types may be in a project area; and regulatory constraints differ among vegetation types.

Historic fire regimes refer to the frequent, low intensity fires that characterized the pre-Comstock era in the Lake Tahoe Basin. Restoring this fire regime is desired because it provides disturbance that creates mosaics of vegetation structure without completely destroying the forest stand. Vegetation descriptions were based on information in Murphy and Knopp (2000) and our own interpretation of the response of vegetation to disturbance.

Stream environment zones (SEZ) are one of the most protected and regulated resources in the Tahoe Basin. SEZs include perennial, intermittent, and ephemeral streams, beach soils areas, and meadows. They provide important functions for water quality, helping filter out impurities before they reach the Lake. SEZ's are also commonly associated with important wildlife habitat. The Basin Plan allows for the removal or disturbance of vegetation in SEZs to maintain the health and diversity of the vegetation or to maintain the character of the SEZ (section 5.13-3).

Healthy SEZ's are typically resistant to high intensity fire. Lush riparian vegetation with small groups of pine trees and less dead material limits the wildland fuels. Many SEZ's currently contain a significant amount of dead vegetation with lodgepole pines encroaching on the riparian vegetation. The result is the increased likelihood of a high intensity wildfire, which not only threatens neighboring communities but significantly impairs the SEZ.

2.1 Mitigation Project Objectives

The objectives for Forests Surrounding Communities are:

- Reduce the threat of wildfire destroying a community by restoring historic fire intensities by managing ground and mid-story fuels so fires burn as low intensity surface fires (flame lengths less than 2 feet).
- Restore the historic forest structure of widely spaced tree crowns to reduce the threat of a crown fire threatening a community. Restore the historic forest structure, with more and larger openings within the forest.
- Where possible, improve forest health by removing sufficient trees to achieve a basal area of approximately 90 to 150 ft²/acre (with appropriate tree or clump spacing) to reduce tree mortality associated with insects and diseases.
- Where appropriate, maintain sufficient snags and downed logs to provide habitat components for dependent wildlife.

The objectives for Brush Fields Surrounding Communities are:

- Reduce the threat of wildfire to a community by establishing and maintaining a mosaic of shrub forms classes that support a low intensity surface fire (flame lengths less than 3 feet).

The objectives for Steam Environment Zones are:

- Achieve vegetation structure and species composition consistent with the historic, low intensity, fire regime.
- Reduce the amount of dead and down material that can carry wildfire within SEZ's.
- Reduce the density, and subsequent encroachment, of lodgepole pines in meadows.

3. ROLES AND RESPONSIBILITIES

This section describes the roles and responsibilities of agencies and organizations in the Lake Tahoe Basin to plan and implement proposed projects. The level of involvement of each agency or organization will vary by project; however, the success of implementing a project will be the shared responsibility of all agencies and organizations.

3.1 Residents and Landowners

According to the *Living with Fire in the Tahoe Basin* publication, defensible space and use of the appropriate building materials are the most important defenses against loss of structures during a wildfire event. As such, private homeowners and landowners constitute the most important group for limiting losses from a wildfire. Each homeowner has a responsibility, re-enforced by state and local codes, to create and maintain defensible space and use non-flammable building construction around their homes.

Public education and voluntary compliance with defensible space measures have been the preferred alternative to addressing the responsibilities of residents and landowners. However, California Public Resources Code mandates landowners and residents to mitigate wildfire hazards around homes with specific vegetation management recommendations. Though these codes have not typically been enforced, local and state agencies have the authority to cite and fine residents and land owners for non compliance with defensible space measures.

The relatively small parcel size of most private lands adds another level of complexity to creating defensible space. Should a homeowner create appropriate defensible space on the property they own, but adjacent property within 100 feet of the home do not have appropriate vegetation management, the adjacent landowner could be criminally liable. This is particularly true in jurisdictions outside the Tahoe Basin that have passed ordinances to address exactly this issue. Beyond the legal requirements, civil liabilities may also be an issue. If an action, or lack of action, by a landowner results in fire spreading from their land to a structure, the offending landowner may be civilly liable for damages. This is particularly true if the fire originated on the offending landowners land and there is legal precedent for this case.

The insurance industry is also addressing the exposure and risk of their insured properties to wildfire hazards. Already in the Tahoe Basin, some homeowners are finding it difficult, if not impossible, to obtain homeowners insurance without proper building materials and defensible space. Even in cases where building materials and defensible space is appropriate, some insurance carriers are denying coverage, opting instead to simply stop insuring structures in the wildland environment.

All of these issues underscore the important role residents and landowners play in mitigating wildfire hazards.

There are agencies available to assist the private landowner with wildfire hazard mitigation. The Tahoe Basin Fire Safe Council and the fire districts can provide technical

support for identifying and address hazards. The Natural Resource Conservation Service (NRCS) has a long standing mission to assist private landowners with natural resource issues. In other areas of the state, the NRCS is actively engaged in hazardous fuels reduction projects. Though funding is limited, programs such as the Wildlife Habitat Improvement Program might offer some cost sharing benefits where landowners can mesh wildlife habitat improvement and fuels reduction goals.

In addition to their own backyard, homeowners should actively support fuels reduction projects in their neighborhoods. Fire protection districts, LTBMU, CTC, California State Parks, and other local agencies are implementing fuels reduction projects on public lands surrounding private ownership. Public projects with active support of local residents will likely be funded sooner and implemented more successfully. These agencies will need to conduct public project review and scoping, gathering input from the public on implementation concerns and specific hazards within the communities. Residents should be informed on the projects so that they may help refine project implementation to tie in with other fuels reduction efforts on private land.

3.2 Tahoe Basin Fire Safe Council

The Tahoe Basin Fire Safe Council (Council) is responsible for providing technical and tactical support to the fire districts, coordinating with land management and regulatory agencies, coordinating activities between homeowner groups, and developing education materials and reaching out to the public to assist with implementation of the community wildfire protection plans.

3.3 Fire Districts

The Fire Districts serve as the lead agencies for planning and implementation of the individual projects and serve as the decision-making body for approval of those projects. They will also be responsible for identifying project priorities, obtaining funding, and facilitating policy changes required to implement the proposed projects.

3.4 Land Management Agencies and Organizations

The role of the LTBMU, California State Parks, California Tahoe Conservancy, local agencies and special districts, and some homeowner associations is to manage the natural resources on lands they administer. These agencies and organizations are responsible for planning and implementing projects on their respective lands that restore ecosystem health by reducing fuel hazards. These groups are also responsible for ensuring their plans are consistent with federal, state, and local laws, regulations, and policies.

3.5 Regulatory Agencies

The regulatory agencies: California Department of Forestry and Fire Protection (CDF), Lahontan Regional Water Quality Control Board (Lahontan), and TRPA enforce regulations and policies designed to protect the environment. CDF enforces the Forest Practice Rules that regulate forest management on private land and some state lands. Removal of trees that are sold as a commercial product generally requires a timber harvest plan. Some activities are exempt from filing a timber harvest plan; these include projects that:

-
- remove trees within 150 feet of a residence or
 - remove dead or dying trees from parcels smaller than 20 acres in the Lake Tahoe Basin.

Additionally, an emergency notice to remove trees (14 CCR 1052) may be filed to remove dead and dying trees or where high, very high, or extreme fuel conditions pose a significant threat on private timberlands.

CDF also enforces Public Resources Code 4291 which requires homeowners create and maintain defensible space around their homes. This code was recently amended to increase the defensible space zone from 30 feet to 100 feet.

Lahontan regulates water quality through the Water Quality Control Plan for the Lahontan Region (Basin Plan), specifically Chapter 5.13, which regulates timber harvest activities. Lahontan also issues waivers for waste discharge requirements for timber harvest activities. All individuals that cut and remove trees must apply for a waiver.

TRPA regulates timber harvest activities through its Code Ordinances, primarily Chapter 71 (Tree Removal) and Chapter 72 (Prescribed Burning). TRPA must approve the removal of all live trees greater than six inches dbh. Additionally, all forest management activities must be consistent with TRPA's Code of Ordinances.

4. PRESCRIPTIONS FOR MITIGATION PROJECT AREAS

Mitigation project prescriptions describe what the mitigation project area will look like when the mitigation project is completed. Prescriptions attempt to define the visual components of the mitigation project area as well as the desired fire behavior and forest health conditions. Four general prescriptions are described in this section. The prescriptions will be accomplished with one or more treatments based on stand structure, topography, and land use.

Vegetation management prescriptions require specifics for vegetation spacing and densities for practical implementation. Trying to apply the variability in nature to vegetation management activities is as much art as science. The prescriptions below are not intended to create a uniform landscape of evenly aged and evenly spaced trees, rather they are guidelines for modifying vegetation to achieve the fire behavior objectives. Groups of trees, with touching crowns, may be kept in a treatment area if the distance between the group of trees and other trees or structures is significant enough to limit the spread of fire should that group of trees “torch”, or burn into the crowns. In this scenario, the spacing around the group of trees should be greater than the individual tree spacing recommended below.

A mosaic pattern of forest stands across the landscape could achieve both fire behavior objectives and ecosystem health objectives desired by land management agencies. Accurately describing this mosaic pattern with a silvicultural prescription is difficult. Currently, no projects using such a prescription have been implemented in the Tahoe Basin. Likely, the use of group selection cuts (removing all of the trees in a small area) will be necessary to create this variability. Land management and regulatory agencies in the Tahoe basin must agree on a prescription for this variability such that contractors can implement such a prescription.

Clearly, additional and more detailed prescriptions will be necessary as projects are implemented and monitored. Agencies should assess completed fuels reduction projects for effectiveness in meeting fuel hazard reduction, ecosystem health, and aesthetic objectives. Lessons learned from complete projects should be used to adjust prescriptions for future projects to better meet the management objectives and, ultimately, the desired future condition of the Tahoe Basin.

4.1 Defense Zones

Defense zones generally surround communities; however, they may also be large blocks of open space within communities. These treatments are used to significantly alter fire behavior and restrict fire from entering (or leaving) a community. The overall objective is to reduce flame length to less than two feet. Flame lengths may vary slightly by vegetation type. When these treatments are around communities, they are 250-1,325 feet wide. Defense zones should meet wildfire hazard reduction, improved forest health and SEZ objectives.

Forest Stands

Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. On steep slopes within the defensible space zone for structures, tree spacing may be increased. The *Living with Fire in the Tahoe Basin* guidelines should be used in creating effective defensible space (Smith 2004). This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sites, white fir should have a higher priority of removal than other species. Should clumps of trees be retained, spacing between clumps should be greater than spacing between individual trees.

Forest health would be improved by reducing tree stocking to approximately 90 to 150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by retaining 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

Brush Fields

Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.

Stream Environment Zone

Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where feasible, mechanical methods should be used because they can achieve fuel hazard and forest health objectives in the most cost effective manner.

4.2 Meadow Restoration

Meadow restoration involves removing encroaching lodgepole pines. In many areas (Washoe Meadows State Park, Pope Beach, Baldwin Beach), high mortality of mature lodgepole pines has increased fuel hazards and impacted the meadow system. The purpose of this treatment would be restoring the historic fire intensity, where flame lengths are less than two feet and create a landscape-level area where fire behavior is significantly modified. Few if any mature lodgepole pines would exist in the meadows.

4.3 Roadside Protection

Roadside protection would occur within a corridor that extends up to 100 feet out from either side of the road. This treatment is designed to protect evacuation routes for community residents and provide safety for firefighters entering a community to provide protection in the event of a wildfire. Any road could be a candidate for a roadside protection project, but private roads and county roads providing access into neighborhoods are the most common locations for roadside protection projects. These roads are typically narrower and sometimes provide the only means of escape from a neighborhood.

Brush and shrubs would have a spacing of 3 times the height of the residual plants and be removed immediately adjacent to the road to keep flames from directly impinging the roadway. Spacing between trees would be at least 20 feet between crowns of residual trees, with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. Trees immediately adjacent to the road would be few. Flame lengths would be less than 2 feet, with enough clearance to keep flames from traveling directly across the roadway.

Vegetation removal techniques may be accomplished by a combination of mechanical thinning, hand thinning, piling and burning, chipping, prescribed burn, and/or mastication. Mastication is the preferred method since it leaves the treated fuel material on-site. Leaving the treated material is particularly desirable on road shoulders to cover bare soil for erosion control.

4.4 Urban Lots

Fuels treatment on urban lots are generally conducted by hand thinning and designed to remove excessive fuels, thereby altering fire behavior and reducing the ability of a wildfire to move to neighboring lots. Trees spacing and ladder fuels will be the same as in the defense zone. On steep slopes within the defensible space zone for structures, tree spacing may be increased. The *Living with Fire in the Tahoe Basin* guidelines should be used in creating effective defensible space (Smith 2004). Urban lots will have about 40% canopy cover and will be between 100 and 150 sq ft basal area.

Urban lot prescriptions are accomplished through a specific combination of thinning with either pile burning or chipping as the disposal method. Implementation of the prescriptions is unique given the proximity to structures and the relatively easy access to the forest stand. Though hand thinning has been the favored treatment technique, mechanical thinning and mastication with small machines should be evaluated as an alternative cost-effective method of treating urban fuels.

Reduce the potential for crown fires by increasing the crown base height to at least 20 feet. Starting with the smallest diameter class and remove suppressed and intermediate trees to achieve the prescribed crown base height. Remove ground fuels greater than three inches diameter and treat shrub densities to achieve flame lengths of no more than two feet. Where possible, retain 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long).

5. TREATMENTS

5.1 Thinning

Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the desired crown base height and tree spacing. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering. If it can be transported in whole or as chips, slash can also be disposed of through biomass utilization in cogeneration and wood composite products.

Thinning can be accomplished through either mechanical or hand techniques as described below.

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 (see photo). While whole tree removal 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% and outside of SEZs except under certain conditions (over snow, or demonstrated non-soil disturbing equipment/conditions). WTR projects require large landings that can accommodate a skidder operation, a large chipper, and semi-trucks. CTL operations require fewer and smaller landings.

Disposal of material treated by mechanical thinning is typically part of the mechanical process. Trees, either whole or cut to length, are removed from the forest by the machine as part of the mechanical thinning process. Slash can be left behind and will need to be

treated. Mechanical thinning is typically a process that includes every element of the vegetation management process, from felling of the trees, to removal of biomass.

Mechanical thinning has the ability to create a more precisely targeted stand structure than prescribed fire (van Wagendonk 1996, Weatherspoon and Skinner 1996, Stephens 1998, Agee et. al. 2000, Miller and Urban 2000). 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, thereby increasing surface fire intensity. It may be necessary to remove or treat fine fuels that result from thinning the stand (Alexander and Yancik 1977 Graham, 2004).

Mechanical thinning techniques use equipment that has the potential to impact soil and sensitive resources. Proper planning and conscientious operation can reduce these impacts to acceptable levels. Mitigation measures may also be necessary to limit these impacts. Mitigation measures will be considered at a more detailed level of project planning.

Hand Thinning

Hand thinning is conducted with crews of approximately 10 individuals who cut trees with chainsaws. 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. Removal of smaller trees is generally limited to younger stands where the trees are smaller. Because hand thinning can only effectively remove smaller material, silvicultural and fuel management objectives may not be fully achieved compared to mechanical thinning. Additionally, hand thinning may require more frequent treatments to maintain acceptable fuel loads than mechanical thinning and hand thinning may not be cost effective in forest stands with excessive ground fuel loading where mechanical thinning would remove or compact those fuels.

Unlike mechanical thinning, hand thinning simply addresses how the vegetation will be cut, without addressing how the material is disposed. This is due to the varied uses for hand thinning (for example on steep slopes where equipment cannot operate, on environmental sensitive areas where equipment cannot operate, or on small lots where the use of equipment is not feasible). Depending upon the situation, hand thinning may be the most appropriate method for vegetation cutting, but some other mechanical means may be employed for removal of the cut material from the site. One or more of the following disposal treatments must be applied in concert with thinning to remove the fuels from the forest.

- Hand Piling and Burning- All cut material and dead and down material greater than 3 inches in diameter and up to 14 inches diameter shall be piled for burning. Piles shall be constructed compactly beginning with a core of fine fuels and

minimizing air spaces to facilitate complete combustion. Piles will be constructed at least 1.5 times the diameter of the pile from residual trees and no taller than five feet to prevent damage when burning. If the area will not be broadcast burned, then each pile will be lined with a wet or hand fire line. At least one half of each pile will be covered with water resistant burnable paper to cover the fine material in the center of the piles. The LTBMU is pursuing research on the impact of pile burning in different SEZ types and conditions, however this practice is not authorized within SEZs at this time.

- 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. Chips scattered throughout the project area will not exceed four inches in depth.
- Forwarding- Forwarding is essentially the portion of mechanical thinning involving removal of material from the forest. A large machine with a stake side bed and grapple moves through the forest and picks up the material, logs, slash, or both and loads it onto the bed for transport back to a central landing area. All the same issues regarding soil disturbance, landing requirements, and slope limitation apply to forwarding as mechanical thinning.
- Yarding- Where steep slopes limit mechanical thinning and forwarding, removal of material is costly. An alternative method for tree and biomass removal is cable yarding. Cable yarding is accomplished through a system cable and pulleys laid out through the forest. Using towers and trees, the cable is suspended or partially suspended above the forest floor, allowing trees to be transported out of the forest without soil disturbance (yarding systems that completely suspend material would be given preference). Similar to helicopter logging (but less costly) cable yarding lifts the trees completely off the ground while moving them up or down to the landing.

Yarding has not yet been used in the Tahoe Basin for fuels treatment and provides a unique solution to operational constraint issues for fuels mitigation projects. The systems take time to setup . Initial project costs with yarding systems may be higher than traditional methods, but as crews become more experienced, costs will decrease.

Thinning and Fire Behavior

Surface and canopy fuel treatments have variable effects on the factors affecting torching and crowning (Table 1). A thinning designed to reduce crown fire hazard will usually raise the effective crown base height (*CBH*). Fuel reduction projects should concentrate on the removal of mainly smaller trees to increase *CHB* and other size classes to achieve forest health objectives. Similarly, while a broadcast burn will usually increase *CBH* by scorching lower branches, a broadcast burn under moderate burning conditions may be patchy and of insufficient intensity to raise effective *CBH* for the whole stand. (Ibid.)

When evaluating the effect of fuel treatments on potential crown fire behavior, it is important to consider the effects of understory thinning on midflame windspeed and fuel moisture. Thinning opens the canopy and increases midflame and surface windspeeds. Increased surface windspeeds - coupled with increased sunlight on the forest floor - create drier fuel conditions in treated stands during summer. These two factors tend to increase surface fire behavior.

In many wildfire scenarios, heavy spotting into fuelbreaks has rendered them ineffective for fire suppression. Thinning stands increases the likelihood that firebrands from torching trees adjacent to the thinning will hit the ground - landing in a receptive, dry fuelbed instead of extinguishing in the overstory canopy.

For these reasons, it is useful to visualize Defense Zones as “anchors” in a landscape-scale strategy that treats large areas of forest adjacent to communities. Defense Zone thinning projects undertaken near communities provide a window of opportunity to implement larger-scale area treatment projects that utilize prescribed fire to treat large areas beyond the wildland urban interface.

Properly executed forest thinning treatments reduce the crown fire potential - improving the defensibility of communities. However, these projects often represent a tradeoff—the decrease in crown fire potential comes at the expense of increased surface fire spread rate, fire intensity, and spotting hazard. While a reduction in crown fire potential and decreased tree mortality following wildfire makes this tradeoff reasonable, proper maintenance of thinning projects is essential if these benefits are to last.

Table 5: Immediate-term effects of fuel treatments on factors that affect the Torching and Crowning Indices(from Scott 1998).

- A blank cell in the table indicates no effect. I = increase, D = decrease, NE = no effect.

<i>Fuel Treatment</i>	<i>Surface Fuels Load</i>	<i>Dead Fuels Moisture</i>	<i>Canopy Base Height</i>	<i>Wind Reduction factor</i>	<i>Canopy Bulk Density</i>
Overstory Thinning	I	D	I to NE	D	D
Understory Removal	I		I		D or NE
Pruning	I		I		
Pile burning	D				
Whole Tree Yarding	D				
Broadcast Burning	D		I or NE		

The most effective and appropriate sequence of fuel treatments depends on the amount of surface fuel present; the density of understory and mid-canopy trees; long-term potential effects of fuel treatments on vegetation, soils, and wildlife; and short-term potential

effects on smoke production (Huff et. al. 1995). In forests that have not experienced fire for many decades, multiple fuel treatments are often required to achieve the desired fuel conditions. Thinning followed by prescribed burning reduces canopy, ladder, and surface fuels, thereby providing maximum protection from severe fires in the future (Peterson et. al. 2003). Potential fire intensity and/or severity in thinned stands are significantly reduced only if thinning is accompanied by reducing the surface fuels (woody fuel stratum) created from the thinning operations (Alexander and Yancik 1977, Hirsch and Pengelly 1999, Graham et. al. 1999).

5.2 Mastication

Mastication requires machines to grind, rearrange, compact, or otherwise change fire hazard without reducing fuel loads. It provides a quick and cost effective method to modify the fuel bed structure to reduce flame length and therefore fire intensity. Mastication is a useful tool in plantations and brush fields, and has applications in thinning small trees for fuel break and roadside maintenance. Mastication is significantly more cost effective than hand crew brush treatments. Cutting and disposal of material occurs in a single action. Chips are left on the ground, providing soil erosion protection and a mat of material for the machine to travel across.

Like other mechanical methods, rocky sites, sites with heavy down logs, and sites dominated by large trees are difficult places in which to operate mastication equipment. Additionally, sparks from mastication heads have the potential to start fires and, when working on public land, these machines are subject to the same activity-level restrictions that apply to most other logging equipment (see photo).

Where mastication is recommended for projects proposed in this report, use rubber tired or low impact tracked vehicles to cut, chip, and scatter all shrubs and small trees up to 10” dbh on site. Brush cover should be reduced by creating a mosaic of treated and untreated shrubs. Brush that is treated should be cut to the maximum of six inches in height. No



individual pieces of cut material shall be greater than 4 feet long. All masticated stumps shall be cut to within six inches of the ground. No debris shall average more than two inches over the entire project area. All cut vegetation will be kept within the unit boundaries.

Thin layers of wood chips spread on the forest floor tend to dry and rewet readily. Deep layers of both chips and chip piles may have insufficient air circulation, making poor conditions for 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 (Graham, 2004).

Mastication equipment has the potential to impact soil and sensitive resources. Proper planning and conscientious operation can reduce these impacts to acceptable levels. Mitigation measures may also be necessary to limit these impacts. Mitigation measures will be considered at a more detailed level of project planning.

5.3 Prescribed Burning

Prescribed burning reduces the loading of fine fuels, duff, large woody fuels, rotten material, shrubs, and other live surface fuels. These changes, together with increased fuel compactness and reduced fuel continuity change the fuel energy stored on the site, reducing potential fire spread rate and intensity (see photo). 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 (Graham, 2004).

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 (for example, mowing), to reduce crown fire hazard and the likelihood of severe ecosystem impacts from high severity fires.

Opportunities to use prescribed fire are limited because of smoke management concerns. Some studies indicate short-term effects of prescribed burning may affect water quality in the Basin. A prescribed burn in Pope Marsh (1995) increased nitrogen concentrations in water samples the first and second year after the burn. In another area, phosphorus

concentration in runoff was the same in unburned and burned forest plots (Murphy and Knopp 2000). Neither study followed nutrient levels 3-6 years post-fire after vegetation became reestablished and that vegetation is characterized by high nutrient uptake to meet increased growth rates. Additionally, smoke particulates may also be associated with algal blooms (Murphy and Knopp 2000). Therefore, long-term effects of prescribed burning on Lake Tahoe may not be well understood.

Use of prescribed burning occurs in two different mitigation project settings:

Prescribed Burning in Forests.

Low intensity broadcast burning should be used to reduce all fuels < 3 inches diameter by 60-80%, the brush component by 50%, and 75% of trees less than three inches dbh. Use fire to prune ladder fuels by scorching the lower 1/3 of branches on 100% of trees less than eight inches dbh. Retain large down logs (14 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:

- six foot maximum scorch height; and,
- less than 10% mortality in conifers > 12 inches dbh.

Do not ignite fires in stream environment zones (SEZs). 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 fuels <1 inch diameter should be consumed in SEZs.

Prescribed Burning in Meadows.

Broadcast burning will occur after all grasses have cured and soils are dried. The burns will be hand ignited and sufficiently hot enough to kill 90% of all standing lodgepole pine. It may be necessary to conduct additional burns in the future to remove unconsumed lodgepole pines and those that have regenerated. In some cases, mechanical or hand thinning may be necessary to remove trees from the edge of the meadow to create a control line for the prescribed burn.

5.4 Review of Cost Factors

Estimated treatment costs were based on those published by TRPA (2004) and by conferring with representatives from LTBMU, California Tahoe Conservancy, and North Lake Tahoe Fire Protection District. Cost factors vary widely because of fuel loadings, operational constraints, and crew capabilities. The costs are limited to the direct cost of project implementation. They do not include off-setting revenue that may be generated by providing commercial products or costs associated with project planning, preparation of environmental compliance reports and administrative overhead during implementation.

Table 6: Treatment specific cost estimates.

Fuel Reduction Treatment	Cost per acre
Mechanical thinning (urban interface)	\$2,000 - \$3,200
Hand thin	\$650 - \$1,350
Hand Pile Burn	\$300 - \$700
Chipping	\$200 - \$700
Mastication	\$700 - \$1,500
Prescribed burning	\$400 - \$900
Urban lots	\$1,850 - \$10,000

Examination of cost factors illustrates conflicting data. Based on the information provided, it appears that hand treatment is less expensive than mechanical treatment. This is not the case. Commercial forestry operations use mechanical methods whenever possible due to its cost effectiveness.

Cost data for completed projects in the Tahoe Basin cannot be compared across treatments. The treatments are not the same for mechanical thinning as they are for hand thinning. Though the prescription objectives might be the same, the projects where mechanical treatments have been employed have treated a significantly higher volume of material than the hand thinning treatments. Mitigation measures associated with environmental compliance for mechanical operation in the Tahoe Basin also adds significantly to the cost of mechanical treatments. Protection of sensitive resources is important, however a review of current regulatory constraints is recommended later in this document to clarify the environmental mitigation process for mechanical operations.

Further complicating existing cost data is the lack of variability of previous mitigation projects. The most common mitigation technique at this time in the Tahoe Basin is hand thinning and pile burning outside sensitive areas. Since pile burning and mechanical operations are not permitted within SEZs and many of the proposed projects are in sensitive areas, it is difficult to assign costs based on empirical data. Mechanical thinning costs are currently based on a cut-to-length harvest system, which is more expensive than other mechanical systems. Combinations of mechanical and hand treatment, such as hand falling and mechanical forwarding or in-woods chipping may prove most cost effective.

Cost estimates for the projects proposed in this document were based on a combination of costs for projects within the Tahoe Basin and a review of costs for projects outside the Tahoe Basin. Professional judgment was used to develop a cost matrix for proposed projects by prescription. The most appropriate treatment was selected to implement the prescription. Using the selected combination of techniques and the existing vegetation conditions in the projects areas as guides, the following cost estimates were used to develop costs estimates for projects.

Table 7: Summary of project cost estimates:

Fuel Reduction Project	Cost per acre
Defense Zone	
<i>Brush, some trees</i>	\$1000
<i>Moderately dense forest stand</i>	\$2500
<i>Very dense forest stand</i>	\$4600
Meadow Restoration	\$1200
Roadway Clearance	\$800
Urban lots	\$4075

Cost effectiveness is not the sole consideration in selecting a treatment method. Mechanized equipment's impact on the environment is also considered. The decision to use mechanical or hand techniques was made based on existing vegetation conditions, cost effectiveness, and existing transportation infrastructure.

6. ENVIRONMENTAL COMPLIANCE

Environmental regulations may protect the environment (e.g. Clean Water Act, Clean Air Act, and Endangered Species Act) or reduce impacts on the environment and allow the public to participate in agency decision-making processes that may affect the environment (e.g. National Environmental Policy Act and California Environmental Quality Act). The extent of environmental compliance is determined by the land ownership where the project is occurring, the funding agency, the complexity of the project, and the number of regulations that govern a project.

All individual projects designed to reduce fuel hazards that are proposed by public agencies, funded by public agencies, or that require federal, state, local, or local discretionary approval will be subject to federal, state, or regional environmental regulations. This plan is advisory and will not result in changes in the human environment without appropriate environmental planning, therefore is not subject to NEPA or CEQA.

6.1 National Environmental Policy Act

All fuel reduction projects funded by the federal government, that occur on federal land (e.g. LTBMU), or require a federal agency to issue a permit must comply with NEPA. Agencies comply with NEPA by preparing environmental impact statements or environmental assessments that evaluate impacts of the proposed project, propose mitigation measures to reduce those impacts, and consider alternative actions that may change impacts on the environment. Environmental assessments are simpler versions of environmental impact statements and they must conclude that the project will not result in a significant impact on the environment. The Healthy Forest Restoration Act only requires agencies to simplify the process by only evaluating two alternative projects in a NEPA document. In some cases, federal agencies have determined that some projects are categorically exempt from NEPA. The Forest Service has recently determined that several types of fuel reduction projects are categorically exempt (Federal Register 68:33814 and 68:44598). Projects that meet these requirements only need to demonstrate that there are no extraordinary circumstances affected by the project, these include threatened or endangered species, cultural resources, wetlands, wilderness, or roadless areas. Most of the projects in the Basin that require NEPA compliance will need an environmental assessment of categorical exclusion. Some projects may require more extensive environmental documentation.

6.2 California Environmental Quality Act

Fuel reduction projects on private lands and some state lands that require approval by a local or state agency must comply with CEQA or a functionally equivalent program (e.g. the California Forest Practice Rules). The documentary requirements for CEQA are very similar to those for NEPA. Most projects in the Basin will require an initial study/negative declaration to comply with CEQA. Some projects may require more extensive environmental documentation. If a timber harvest plan is prepared in lieu of a CEQA document, it must be signed by a California Register Professional Forester. Some

small projects, such as defense zone clearing are generally exempt from CEQA or a functionally equivalent program.

6.3 TRPA

Tree removal on all lands must comply with the TRPA Code of Ordinances, Chapter 71 (2004). Removal of all live trees over six inches dbh requires approval by TRPA. A tree removal plan must be prepared for all projects involving substantial tree removal. Substantial tree removal projects are defined as cutting more than 100 trees over 10" dbh in an area greater than 20 acres or cutting more than 100 trees over 10" dbh on land capability classes 1a, 1b, 1c, 2 or 3. Tree removal plans will also be consistent with all other TRPA Code of Ordinances.

6.4 Regional Water Quality Control Board – Lahontan Region (Lahontan)

California State Water Code section 13269 authorizes Lahontan to waive the requirement to obtain a waste discharge permits and pay filing fees. To be eligible for the waiver all timber harvest activities, including fire hazard abatement, must apply for a waiver. Fire safe treatments, those within 150 feet of existing structures, are not required to apply for a waiver, unless they are within, or directly adjacent to an SEZ. Applications for waivers must be submitted to Lahontan for approval. The application process and required supporting documentation varies with the magnitude of potential impacts on soils and stream environment zones from different treatments (mechanical and hand thinning, mastication, prescribed burning). In the interest of streamlining implementation, Lahontan may approve specific fuels management areas under each fire plan under a single waiver through each of the fire protection districts.

6.5 Recommended Review of Environmental Compliance

Current regulatory policies are in need of review to ensure they appropriately protect sensitive resources from preventable threats. A review of the regulatory constraints is intended to further protect those resources from the threat of wildfire. This threat, until recently, has not been thoroughly considered in those regulations.

Regulatory agencies in the Tahoe Basin began addressing impacts to water quality over 30 years ago. The impacts perceived to be the greatest threats to water quality have evolved over the years as better scientific and empirical data becomes available. Additional natural resource disciplines have been incorporated and regulated as the impacts to water quality are better understood. Wildland fire, as a threat to water quality and watershed health, is no different. Regulatory agencies charged with protecting water quality must address the threat wildfire poses to water quality with the same vigor they address the threat road construction poses to water quality. The first step in addressing the wildfire threat to water quality is to review language in existing policies that is in conflict with activities designed to reduce the wildfire threat. This review is occurring within the existing Pathway 2007 planning process, however some issues may require immediate attention.

To successfully address the threat of wildfire, regulatory agencies must not only accept, but promote, vegetation management concepts that would not have been considered in

the past. Since catastrophic wildfire has not visited the Tahoe Basin in the last 50 years it cannot be assumed that catastrophic wildfire will not occur in the next 50 years. In fact, the previous 50 years significantly increases the likelihood of a catastrophic wildfire in the next 50. Agencies charged with protecting sensitive resources should be at the forefront of efforts to mitigate the wildfire threat. Given their combined knowledge of water quality and watershed impacts, the regulatory agencies can best identify and inform on acceptable innovative technologies for vegetation management.

In many cases, the suggested review of ordinances and codes recommend not a removal of language, but a further clarification of interpretation. The codes and ordinances contain verbiage concerning what cannot be done in vegetation management activities. Language needs to be included defining acceptable limits for disturbance and mitigation measures that should be accomplished. It is recommended the following policies be evaluated:

- Basin Plan 5.13-3: “No vegetation shall be disturbed or removed from the Stream Environment Zones except to maintain the health and diversity of the vegetation or to maintain the character of the Stream Environment Zone.”

Many SEZs are characterized by dead and dying vegetation, particularly lodgepole pines. These conditions are inconsistent with historic fire regimes that periodically disturbed or removed vegetation from these areas.

This policy should be expanded to provide a clear definition of a healthy SEZ, particularly regarding the amount of dead material in an SEZ. It is recommended the vegetation that resulted from the historic fire regime be used as a definition of a healthy SEZ.

- Basin Plan 5.13-2: “all vehicles shall be restricted to areas outside the SEZ or to existing roads within SEZ’s, except for over snow removal. . .”

Simulated and observed fire behavior demonstrated high mortality in SEZs which would eliminate or reduce the vegetation that provides cover and reduced water temperature. Because of the number and size of these trees, hand labor is not a cost-effective means of tree removal. Over snow conditions offers an opportunity for mechanized vehicles to operate; however, those conditions are unpredictable and may not be widely available, particularly during dry years. Because these conditions are unpredictable, crews may be unavailable or mobilization costs increase significantly. Further, over snow operations will not allow treatments to address surface fuel hazards.

Project layout and timing can be used to limit the impacts of mechanical equipment. Careful placement of forwarding tracks and transport corridors can keep the impact to sensitive areas to a minimum. Working on dry portions of the sensitive areas at during dry seasons will also limit impacts. As stated above, the impacts of mechanical equipment usage can are offset by the long term benefit of treatment in the SEZ.

This policy should be reviewed to provide more predictability in allowing currently available mechanized vehicles to restore the health of SEZs.

-
- Basin Plan 5-13-3: “Forest management activities on high erosion hazard lands shall be solely by means of helicopter, balloon, over snow, or other techniques which will not result in any permanent soil disturbance.”

A large number of projects requiring mechanical thinning are proposed on lands mapped as Bailey land classification category 1a (high erosion hazard). Field verification may determine these lands have not been mapped correctly. However, the inability to use mechanical equipment on those lands that have been mapped correctly would eliminate an opportunity to treat hazardous fuels in the wildland urban interface.

This policy should be reviewed to identify mechanical vehicles or operating techniques that would result in an acceptable level of soil disturbance but not permanent soil disturbance.

- TRPA Code of Ordinances 71.4.A(1)(2004): Objectives for tree removal include, “Restoration and expansion of stream environment zones and riparian vegetation.”

The definition of restoration of stream environment zones and riparian vegetation should be developed in concert with Lahontan and adopted by both agencies.

- TRPA Code of Ordinances 71.4.C(1)(2004): “TRPA will review site-specific proposals for, and may permit, the use of ‘innovative technology’ vehicles and or ‘innovative techniques’ for the purpose of fire hazard reduction in SEZs provided no significant soil disturbance or significant vegetation damage will result from the use of equipment.”

Innovative technology vehicles or techniques are not currently available. This is evident by the lack of projects in the Basin using unique technologies and the lack of regulation identifying acceptable technologies. Without significant funding, there is little incentive for companies to invest the capital and resources necessary to develop machinery specifically designed for the Tahoe Basin because of the limited use and available market.

This does not mean treatments should be limited to the current set of treatment techniques employed in the Basin. Instead, a review of existing vegetation management technologies outside the Basin should be completed. This policy should be reviewed in concert with Lahontan to clarify what level of soil disturbance would not be considered significant. Additionally, it should delete references to “innovative” and allow for currently available vehicles and technology that do not cause significant soil disturbance.

- TRPA Code of Ordinances 71.4.C(b)(vi)(2004): “Operations should incorporate measures to avoid impacts to wildlife during critical wildlife nesting and denning periods.”

This policy allows no impacts on all wildlife. It establishes a more restrictive threshold than NEPA or CEQA which may avoid impacts on special-status species (candidate,

threatened or endangered, sensitive species, fully protected species, or special-interest species) rather than all species of wildlife.

This policy should be reviewed to allow less than significant impacts on wildlife that are not classified as special-status species.

- Fuel management projects in the Tahoe Basin may involve multiple ownerships and regulatory reviews that will increase the cost of project planning and approval.

The land management regulatory agencies should review existing regulations and policies and develop a cost effective process to approve fuel reduction projects. This may include a checklist that can be used for projects that use standard treatments and techniques. The checklist would identify expected impacts and pre-approved mitigation measures that can be quickly reviewed and approved by the appropriate agencies.

IV. SECTION TWO

1. FALLEN LEAF FIRE DEPARTMENT

1.1 Demographics, location, topography, and climatic data

The Fallen Leaf Fire Department (FLFD) is located in the southwestern portion of the Lake Tahoe Basin (figure 5). The district serves the communities located adjacent to Fallen Leaf Lake on the east and west sides, and the homes located in the Glen Alpine Canyon; an area of approximately 6 square miles. The Department's immediate response area is six square miles with mutual aid responsibilities of about 85 square miles. A summary of land management in the Department's service area is provided in Table 8.

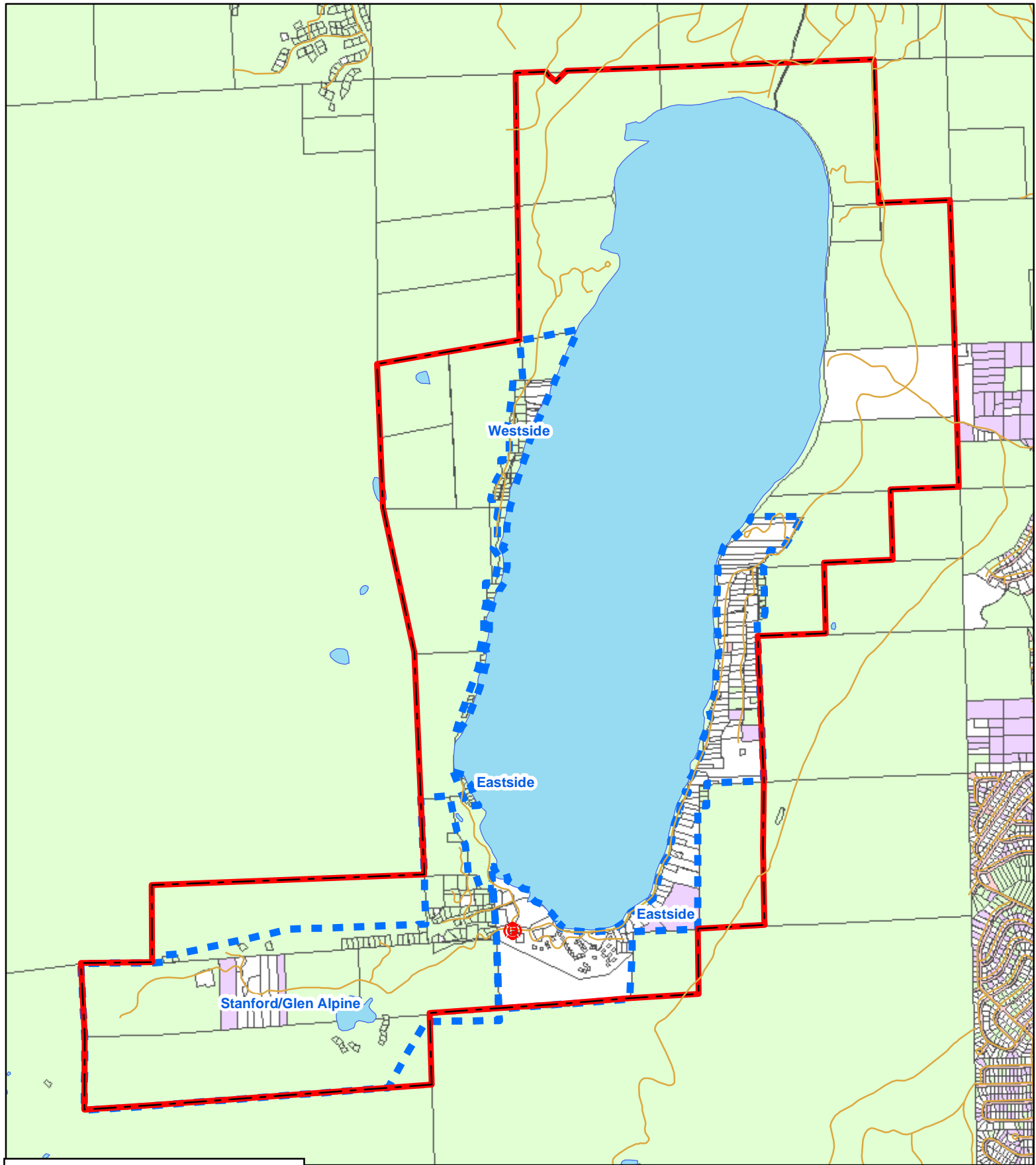
Table 8: Land management acreage within the Fallen Leaf Fire Department.

Land Administrator	Acres
State of California	32
LTBMU	3,316
Private/Municipal	298
Total	3,646

Source: TRPA GIS Databases (2004)

The area has a permanent year-round population of approximately 50 residents; however the population increases to over 2,000 during peak summer recreational periods. The economy in the area is based primarily on tourism, recreation and vacation home ownership. Daily car visitors, business meetings, seminars, organized summer camp activities, camping, hiking, mountain biking, fishing and summer water sports, bring thousands of tourists from all over the world to the area each year.

Elevations within the FLFD range from 6,377 feet above mean sea level at Fallen Leaf Lake to 7,377 feet at the Desolation Wilderness boundary below Cathedral Lake on the west side of the district. The majority of the district is contained inside the bowl created by the medial, lateral and terminal moraines of Angora Ridge, Cathedral Ridge and Taylor Creek meadows. A portion of the district and a community of approximately 70 summer homes continues up the Glen Alpine Creek drainage on the south end of Fallen Leaf Lake to Lily Lake and further southwest to the Desolation Wilderness Boundary. The southwest to northeast orientation of this drainage, glacially created bowl and of the lake itself has a dominant effect on the wind patterns in the district causing them to blow mostly from a southwest or from a northeast direction depending on the passage of low pressure systems.



Legend

Owner

- Private
- Federal
- Local
- State

15 Fire Station



Community



Fire Department Service Area



Lake

Roads

Paved/Gravel

Figure 5.
Fallen Leaf Fire Department

0 0.25 0.5 0.75 1 Miles



1.2 Fire District Overview

Wildfire Protection Resources

Wildland firefighting suppression resources rapidly available to the Fallen Leaf Fire Department include the following agencies:

- US Forest Service Lake Tahoe Basin Management Unit (LTBMU)
- Lake Valley Fire Protection District
- South Lake Tahoe City Fire Department
- Meeks Bay Fire Protection District
- North Tahoe Fire Protection District
- Tahoe-Douglas Fire District Fire Department
- North Lake Tahoe Fire Protection District
- Other local fire departments participating in the Lake Tahoe Regional Fire Chiefs Association Mutual Aid Agreement
- California Department of Forestry and Fire Protection (CDF)

The Fallen Leaf Fire Department has two modes of operation: summer (May 15 at 0800 to October 15 at 0800), and winter (October 15, 0800 to May 15, 0800). During summer operation, minimum staffing consists of one volunteer firefighter with BLS skills able to respond within four minutes on the nearest fire department apparatus, 24 hours a day, 7 days a week. During winter operation, there is no minimum staffing. Volunteers make every effort to respond given road conditions and availability of personnel.

The Fallen Leaf Fire Department is a combination paid/volunteer fire department. FLFD employs one full time paid fire chief, one part time paid fire chief relief, and 27 volunteer firefighters. The FLFD is a department of the Fallen Leaf Lake Community Services District, which is a special district of El Dorado County covering six square miles formed in 1983 specifically to provide fire protection services. A publicly elected five-member board of directors governs the community services district. The Board of Directors generally meets six times a year, three times in the summer months and at various scheduled times in the fall, winter and spring.

Wildfire resources at any given time are supplied from one of two locations in the district. During the fire season, one fire engine is staged on the west side of fallen leaf lake and two engines are generally available from the department's station located at 241 Fallen Leaf Road on the east side of the lake. FLFD apparatus are:

- 1 type 1 engine
- 1 type 2 engine
- 1 type 3 engine
- 1 type 4 engine
- 1 type 2 fireboat capable of 500 gpm

*Source: Personal Communication with Fire Chief Chris Sauer,
Fallen Leaf FD September 2004.*

Water Sources and Infrastructure in the District

There are several water supply systems located in the FLFD. These systems are broken down into four main categories:

- storage tanks of from 5,000 to 12,000 gallons that must be drafted from are identified in the district by “ST” signs;
- fire pump locations which draw water from surface sources such as the lake itself or Glen Alpine Creek are identified with “FP” signs;
- standpipes that run from Fallen Leaf Lake or from other static supplies up to strategic areas around the lake are marked with “SP” signs; and,
- constantly charged fire hydrants which flow more than 250 gallons per minute are signed “FH”.

Portions of the FLFD within 1000 feet of the lake edge can be served by utilizing the standpipe system, or through hose lays serviced with 500 gallons per minute of water via the FLFD fireboat. There are numerous other low volume sources of water throughout the district in the form of 1 ½” hydrant risers, but these are of limited use in a fire situation.

The ISO rating for the communities within the FLFD service area have a split classification of 4/9.

Fire Protection Personnel Qualifications

All of the FLFD firefighters are encouraged to complete the NWCG S-190 basic wildland firefighters course, which is offered in the spring of each year. During six months of the year, volunteers train in the district once a week.

FLFD Detection and Communication

Fires are reported in the FLFD directly to Station 9 and through 911 calls that are answered in the El Dorado County Dispatch Center in Placerville, and then transferred to the South Lake Tahoe Police and Fire Dispatch center. Fires are communicated to fire response personnel and volunteers through the use of radios and pagers. The radio system is compatible with neighboring agencies and wildland fire coordination usually occurs on the USFS LTBMU main frequency, with tactical operations occurring on White Fire 2. Due to the bowl shape of the district it is sometimes necessary to utilize frequencies other than the main South Lake Tahoe fire dispatch frequency to ensure clear communication, but this frequency change usually occurs without confusion and provides clear communication. On “Red Flag” days, occasional fire patrols will be implemented on a random basis in the district, and it is possible to get over flights of aircraft for smoke checks.

Work Load

In 2003, FLFD responded to 50 calls, of which 11 were wildland or illegal campfires. Response times are 4 to 14 minutes depending on location, with an average response time of 8 minutes. An average of 5 to 10 fire personnel respond to each call.

1.3 Community Preparedness

The FLFD has an emergency wildfire evacuation plan which is updated and distributed to residents annually.

In 1993, the BOD passed a resolution requiring all residents to comply with California Public Resources Code 4291, which, at the time, required flammable vegetation be removed within 30 feet of all structures. The law has recently been updated to 100 feet of clearance. The BOD resolution increased this distance to 50 feet. There is currently an inspection program to determine compliance with this resolution designed to educate and motivate homeowners, but no enforcement actions have been taken, to date, for residents who do not comply.

El Dorado County has adopted building ordinances requiring non-flammable roofing materials be used on new construction. Wood shake roofs, even treated with retardant are not allowed.

1.4 Hazard Assessments

The Fallen Leaf Fire Department is divided into three communities to assess the structural ignitability and hazards within the district. The communities are:

- East Side Private
- West Side Forest Service Tracts
- Sanford/Glen Alpine Forest Service Tracts

Structural Ignitability

FLFD fire protection district personnel conducted an assessment of building materials and defensible space within the communities. Using sampling sheets provided by the consulting team, fire personnel reviewed (from the street) all of the lots in the FLFD communities, noting flammability of siding, roofing, and unenclosed features. They also assessed the effectiveness of defensible space around the homes. The results of this survey are provided in Table 9.

Table 9. Structural ignitability factors for the Communities served by the FLFD.

Percentage of Lots and Homes			
Community	Without Defensible Space	With Flammable Unenclosed Structures	Structural Rating
Eastside	71%	89%	Extreme
Westside	68%	64%	High
Stanford/Glen Alpine	75%	77%	Extreme

The results indicate that many structures have appropriate roofing materials, but a significant number of structures lack non-flammable siding materials. Decks and overhanging unenclosed structures, where embers could be trapped and ignite a home, are also prevalent. Any of these building materials and construction issues could result in the

loss of a home during a fire event. For a structure defense to be effective, all building materials must be non-flammable and openings that trap embers must be closed.

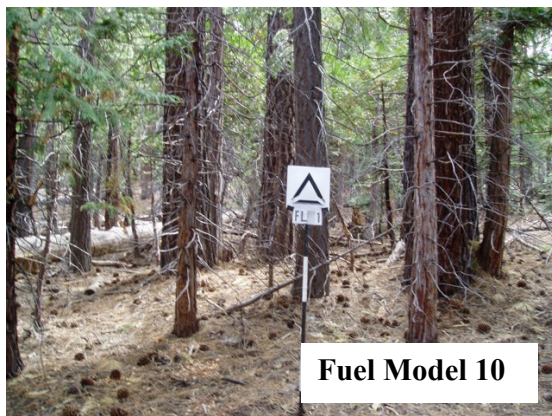
Defensible space is generally inadequate around structures with 71% of the structures lacking defensible space.

Fire Behavior Analysis

Five forest sampling plots were recorded in the Fallen Leaf communities to use in fire behavior modeling. These plots provided information for creating fire behavior assessment for each community.

Table 10: Fire Behavior Analysis

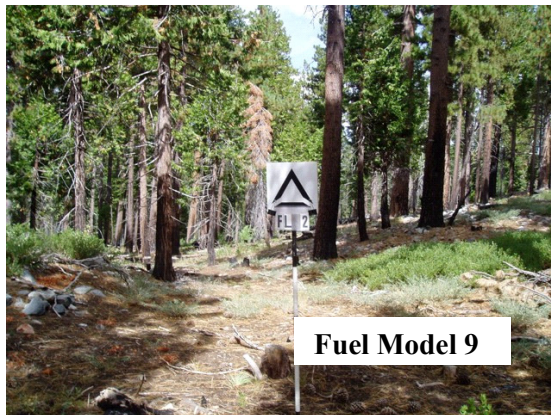
Community	Plot Number	Fuel Model	Canopy Base Height	Basal Area	Flamlength (feet)	Rate of Spread (feet per hour)	Fire Type
Eastside	FL 1	10	3	1225	3	258	Passive Crown
	FL 2	9	31	86	1.7	250	Low Intensity Surface Fire
	FL 3	10	2	374	5.3	660	Passive Crown
Westside	FL 4	5	N/A	125	3	792	Moderate Intensity Surface Fire
	FL 5	5	N/A	9	5.3	1465	High Intensity Surface Fire



Photographic examples of the different fuel models found in the Fallen Leaf area are shown below.

All but one of the plots have fuel loadings, forest stand structure, and fire behavior characteristics that exceed the objectives established earlier in this document. The plot that meets those objectives, FL2, is in an area previously treated by the LTBMU. The plot demonstrates the fire behavior and forest health conditions when mitigation

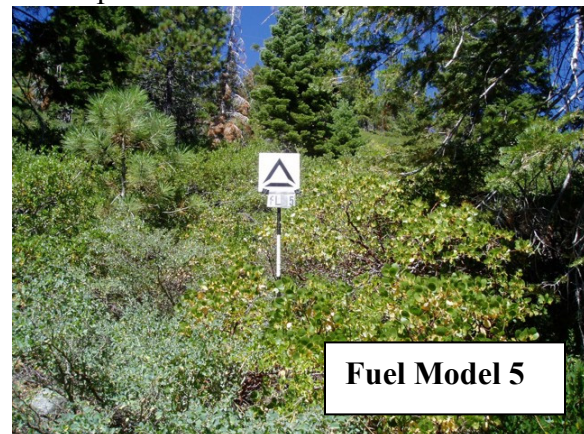
objectives are met.



The fire behavior demonstrates the different challenges the Fallen Leaf communities face with current fuel conditions. Note the fire behavior in sample sites with fuel model 10. Given that flame lengths of 3 feet are difficult to control under the best of circumstances, fire behavior in most of these areas will be uncontrollable by direct attack with the immediate suppression resources available within the district. Not only do these conditions threaten the homes in the area, but given the single lane road for

access into and out of the community, entrapment during a fire event is a very real possibility. The fire behavior will make the road impassable.

FL5 demonstrates a different challenge. Fuel model 5 is a brush fuel model, so flame lengths are smaller than those in timber fuel types. But the rate of spread is significantly higher, too fast for initial attack resources to contain, leaving residents little warning or time to evacuate from the fires path.



In addition to the elements addressed in the structural ignitibility section, fire district personnel evaluated the Fallen Leaf communities on a number of other criteria including slope, aspect, community design, and fire suppression infrastructure. Combined with the results of the structural assessment, each community was given a community rating.

Table 11: Assessment Measures

Community	Structural Assessment	Fire Behavior Rating	Community Assessment
Eastside	Extreme	Extreme	Extreme
Westside	High	Extreme	Extreme
Stanford/Glen Alpine	Extreme	Extreme	Extreme

1.5 Mitigation Measures

Residents and Landowners

Residents and private landowners are the most effective group in mitigating wildfire hazards. Defensible space, building materials, and home construction guidelines are

designed to reduce the risk of structure loss during a wildfire to less than 1%, according to *Living with Fire in the Tahoe Basin* publication (Smith 2004). If completed implemented, almost all structures within a community will survive a wildfire even if no community mitigation projects have been implemented. Landowners must take an active role in addressing these hazards on their property.

The results of the structural assessment conclude that most homes need to improve some component of defensible space, building materials, or home construction. California Public Resources Code 4291 (PRC 4291) requires homeowners to address wildland fire hazards through creation of defensible space and other building construction mitigation measures. Specifically, the code requires homeowners to:

- Maintain adequate defensible space 30 feet around structures (this will increase to 100 feet January 1, 2005)
- Remove that portion of any tree which extends within 10 feet of the outlet of any chimney or stovepipe.
- Maintain any tree adjacent to or overhanging any building free of dead or dying wood.
- Maintain the roof of any structure free of leaves, needles, or other dead vegetative growth.
- Provide and maintain at all times a screen over the outlet of every chimney or stovepipe that is attached to any fireplace, stove, or other device that burns any solid or liquid fuel. The screen shall be constructed of nonflammable material with openings of not more than one-half inch in size.

Use of appropriate building materials is another important mitigation measure homeowners can address. Homeowners are required, through El Dorado County Building Code, to install non-flammable roofs when constructing their homes. Wood shake shingles, even treated, are not allowed. While this code does not apply to existing homes, the fire safe message is clear; use nonflammable building materials. Even is not required by law, homeowners should use non-flammable materials on the outside of their homes. Homeowners with wood shake roofs should have their roofs replaced with non-flammable material. Insurance companies are increasing premiums or in some cases refusing to renew policies for homes with flammable roofing material.

To address these issues, residents must educate themselves on the *Living with Fire in the Tahoe Basin* guidelines and review their property for needed improvements (Smith 2004). If residents have questions regarding the information, they should contact their local fire district to review their property and provide guidance.

The *Living with Fire in the Tahoe Basin* guidelines provide significant detail regarding the spacing and removal of trees and shrubs from around the homes (Smith 2004). Recommended spacing is commonly a minimum, residents may wish to remove more vegetation where regulations allow. On vacant lots and in the defense zone on their properties residents and landowners should provide at least 10 feet of spacing between trees, greater distances on slopes over 20%. When choosing which trees and shrubs to remove on their property, preference should be given to those individuals that are smaller

and suppressed. Removal of this vegetation is less likely to require permits than larger trees and leaves the more desirable trees.

Maintaining defensible space is a continuous process. Each year residents and landowners should re-evaluate their property to ensure proper defensible space criteria are met.

Community Defensible Space Program

To assist local landowners with disposal of the biomass material generated by creating defensible space, the FLFD and Tahoe Basin Fire Safe Council must continue the community defensible space program. Demand for the program is positive and most programs rely on grant funding to operate. Additional grant funding should be secured to continue this program.

Assuming a 100% participation rate of properties under 2 acres, the cost estimate for the community chipper program in FLFD is \$206,000

Fuels Reduction Projects

To address the community hazards a number of mitigation projects were developed. Fuels reduction projects are designed to address the fuel hazards within and around the communities. Where possible, projects address not only the fuel hazard objectives, but forest and stream environment zone health objectives. The projects are described in detail in the following section.

Developing project priorities is a critical element of the community wildfire protection plan. Priorities were developed using a combination of the available datasets as criteria, including the urban values at risk (Murphy and Knopp 2000), community hazard ratings, fire behavior ratings, project type, and completed treatments in the area. The consultant team rated each of the projects according to the above elements. The fire chief made final adjustments to the ratings based on district specific knowledge.

Prioritizing the top projects in a district fairly clear. Fire professionals across all agencies typically agree on the areas in most dire need of treatment in each district. Prioritizing the projects in the middle can be difficult. A variety of factors can be considered in the prioritization, many canceling the effects of others. Using the five criteria outlined above provided a sound method for project prioritization.

In addition to the projects outlined in this plan, the project work proposed by the LTBMU is also identified. LTBMU staff provided GIS datasets mapping the areas they expect to treat within the next 10 years around communities. These project areas were not included in mitigation projects proposed in this plan and are instead called out separately. Specific prescriptions and treatments have not been identified for these areas, so a uniform cost factor of \$2,500 per acre was used to calculate the total cost for LTBMU projects within the WUI.

Table 12: Summary of Projects, Fallen Leaf Fire District

Priority	Project Name	Project Type	Project Acres	Total Project Cost
1	FL2	Defense Zone	87	400,200
1	FL4	Defense Zone	75	345,000
1	FL5	Defense Zone	28	128,800
1	FL6	Defense Zone	6	15,000
1	FL7	Defense Zone	15	69,000
2	FL3	Defense Zone	72	331,200
3	FL1	Roadside Protection	92	73,600
3	FL9	Defense Zone	107	267,500
4	FL8	Roadside Protection	12	9,600
Total Cost for Wildfire Protection Plan Projects				\$1,639,900

		Community Defensible Space Program		206,000
Total Cost for Community Defensible Space Program				\$206,000

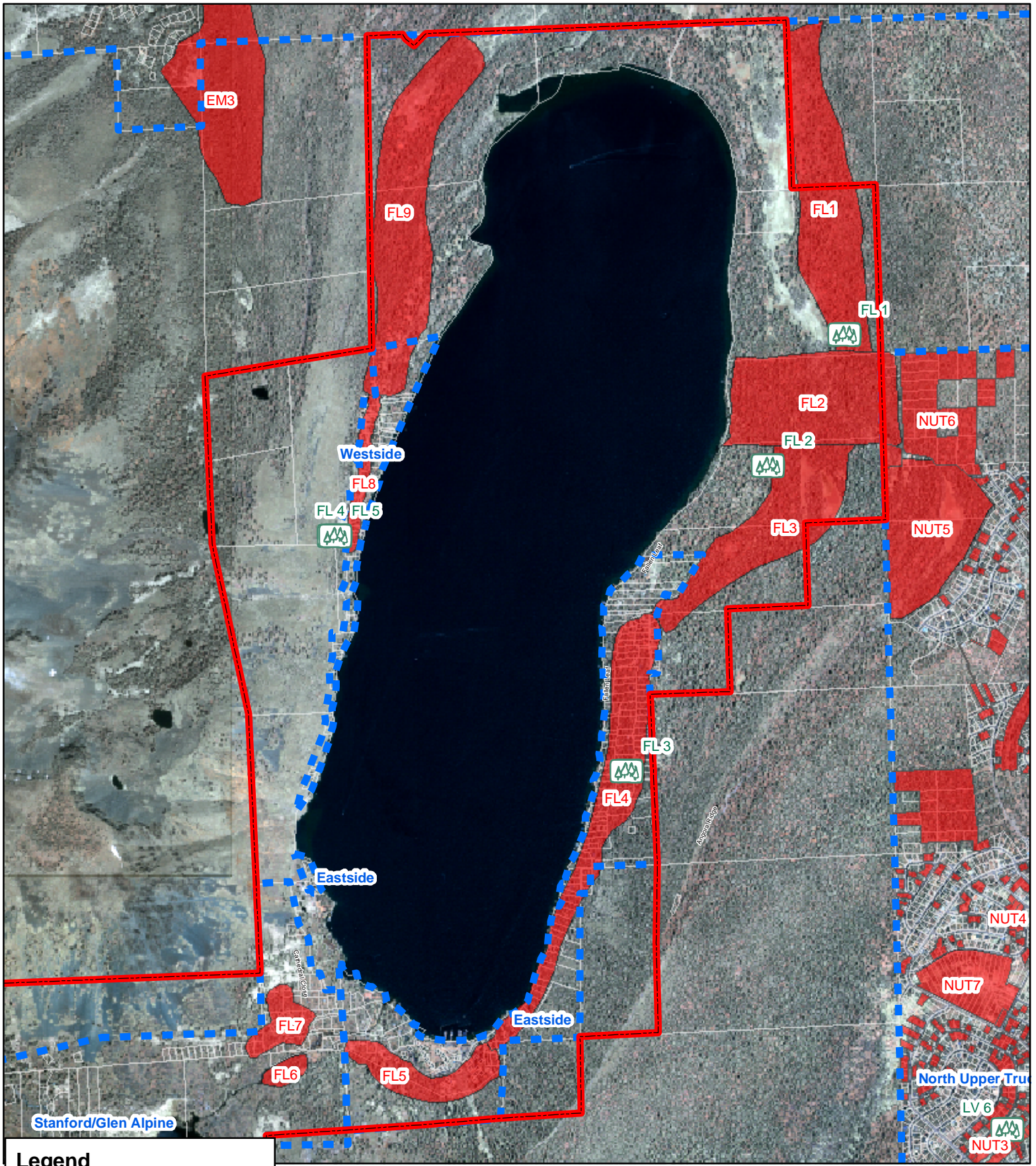
		Project Proposed by LTBMU in the WUI		454,060
Total Cost for Project Proposed by LTBMU				\$454,060

Summary of all Project Costs \$2,299,960

The allocation of proposed projects by community and major landowner is summarized in Table 13.

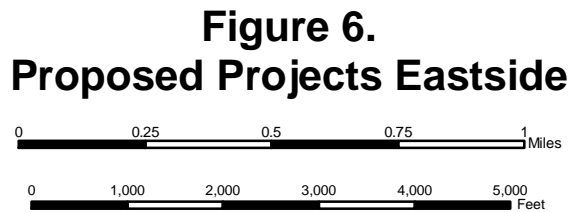
Table 13: Allocation of Proposed Hazard Mitigation Projects across Ownership

Fire District	Landowner						Total Acres
	LTBMU by Fire District	Future LTBMU	California State Parks	California Tahoe Conservancy	Local Agency	Private	
Fallen Leaf	300	343	0	2	1	250	896



Legend

- Proposed Project
- Fire Behavior Sample Location
- Community
- Fire Department Service Area



Risk/Hazard Identification and Mitigation Project Worksheet

Fire District: Fallen Leaf

Name of Community: Eastside

Date: November 2004

Project Title: Fallen Leaf 1 – FL1

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project is NFFL fuel model 9. A fire in the area would have a rate of spread of 250 to 400 Feet per hour with flame lengths from 1 to 3 feet. The fire would be of low to moderate intensity surface fire.*

***Tactical Decision for Project:** The project will protect the single access in and out of the Fallen Leaf Lake area during a wildfire. Evacuation of the community is a critical concern during a fire event.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Third

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

FL1 is located northeast of Fallen Leaf Lake.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

Roadside protection

Roadside protection would occur within a corridor that extends up to 100 feet out from either side of the road. This treatment is designed to protect evacuation routes for community residents and provide safety for firefighters entering a community to provide protection in the event of a wildfire. Brush and shrubs would have a spacing of 3 times the height of the residual plants and be removed immediately adjacent to the road to keep flames from directly impinging the roadway. Spacing between trees would be at least 20 feet between crowns of residual trees, with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. Trees immediately adjacent to the road would be few. Flamelengths would be less than 2 feet, with enough clearance to keep flames from traveling directly across the roadway.

Vegetation removal techniques may be by a combination of mechanical thinning, hand thinning, piling and burning, chipping, prescribed burn, and/or mastication. Mastication is the preferred method since it leaves the treated fuel material on-site. Leaving the treated material is particularly desirable on road shoulders to cover bare soil for erosion control.

***Prescribed Burning in Forests.** 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 three inches dbh. Use fire to prune ladder fuels by scorching the lower 1/3 of branches on 100% of trees less than eight inches dbh. Retain large down logs (14 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:*

- six foot maximum scorch height; and,
- less than 10% mortality in conifers > 12 inches dbh.

Do not ignite fires in stream environment zones (SEZs). 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 10-hour fuels (<1 inch diameter) should be consumed in SEZs.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classifications 1A and 3. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classifications and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area.

The mechanical treatments can be accomplished by avoiding the sensitive areas in the project.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

*Roadway Clearance \$800 per acre
\$800 x 92 acres = \$73,600 **Total = \$73,600***

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior. The shoulders of the road should be treated annually to provide enough vegetation clearance along the roadway.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Fallen Leaf

Name of Community: Eastside

Date: November 2004

Project Title: Fallen Leaf 2 – FL2

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project area is a NFFL fuel model 10. A fire in the area would have a rate of spread of 300 - 500 Feet per hour with flame lengths 3 to 6 feet. The type of fire would be high intensity surface fire due pockets of heavy fuel loading.*

***Tactical Decision for Project:** The defense zone was selected to protect the community to the east of the project area and to provide safe ingress and egress. It also connects to the LTBMU projects adjoining the area.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

First

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

FL2 is located east of Fallen Leaf Lake and south of FL 1.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the over story unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

***Stream Environment Zones Prescription:** Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.*

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

Hand Piling and Burning. All cut material and dead and down material greater than 3 inches in diameter and up to 14 inches diameter shall be piled for burning. Piles shall be constructed compactly beginning with a core of fine fuels and minimizing air spaces to facilitate complete combustion. Piles will be constructed at least 1.5 times the diameter of the pile from residual trees and no taller than five feet to prevent damage when burning. If the area will not be broadcast burned, then each pile will be lined with a wet or hand fire line. At least one half of each pile will be covered with water resistant burnable paper to cover the fine material in the center of the piles.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area.

Mechanical operations can avoid the SEZ during implementation.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$4,600 per acre
\$4,600 x 87 acres = \$400,200

Total = \$400,200

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Fallen Leaf

Name of Community: Eastside

Date: November 2004

Project Title: Fallen Leaf 3 – FL3

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project fire behavior:** The project is an NFFL fuel model 9. A fire in the area would have a rate of spread of 250 to 400 feet per hour with flame lengths of 1 to 3 feet. The fire type would be low to moderate intensity surface fire.*

***Tactical Decision for Project:** The defense zone was selected to protect the community to the east of the project area and to provide safe ingress and egress. Evacuation of residents and ingress of firefighters is a critical concern during a fire event. The project would also protect the forest from a fire initiating above the community.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Second

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

FL3 is located NE of the Eastside community.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the over story unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

***Stream Environment Zones Prescription:** Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.*

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Prescribed Burning in Forests. 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 three inches dbh. Use fire to prune ladder fuels by scorching the lower 1/3 of branches on 100% of trees less than eight inches dbh. Retain large down logs (14 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:

- six foot maximum scorch height; and,
- less than 10% mortality in conifers > 12 inches dbh.

Do not ignite fires in stream environment zones (SEZs). 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 10-hour fuels (<1 inch diameter) should be consumed in SEZs.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classification 1A. The current proposed prescription of mechanical treatment in conflict with the operational constraints within Bailey Landuse Classifications and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area.

Mechanical operations are required for the cost effective completion of this project. Over the snow operations may be an option.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$4,600 per acre
\$4,600 x 72 acres = \$331,200

Total = \$331,200

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Fallen Leaf

Name of Community: Eastside

Date: November 2004

Project Title: Fallen Leaf 4 – FL4

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project fire behavior:** The project area is NFFL fuel model 10. A fire in the area would have a rate of spread of 600-1000 feet per hour with flame lengths of 6 to 10 feet. The type of fire would be a high intensity surface fire due to heavy fuel loading on the ground and dense ladder fuels.*

***Tactical Decision for Project:** The defense zone was selected to protect the homes above Fallen Leaf Rd from being destroyed by a fire starting on the road. Evacuation of residents and ingress of firefighters is a critical concern during a fire event. The project would also protect the community from a fire initiating above the community.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

First

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

FL4 is located southeast of Fallen Leaf Lake and in the northeastern portion of the Eastside community.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the over story unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

***Thinning:** Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.*

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. Chips scattered throughout the project area will not exceed four inches in depth.*

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a Bailey Land Classification 1A. The current proposed prescription of mechanical treatment in conflict with the operational constraints within Bailey Landuse Classifications. The Bailey Land Class should be ground verified to ensure they apply to the project area.

Mechanical operations are required for the cost effective completion of this project. Over the snow operations may be an option.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

*Defense Zone \$4,600 per acre
\$4,600 x 75 acres = \$345,000*

Total = \$345,000

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Fallen Leaf

Name of Community: Eastside

Date: November 2004

Project Title: Fallen Leaf 5 – FL5

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project is a NFFL fuel model 10. A fire would have a rate of spread of 300 feet per hour with flame lengths of 4 to 6 feet. The type of fire would be a high intensity surface fire due to heavy fuel loading on the surface and dense ladder fuels. There is the potential for crown fires*

***Tactical decision for Project:** Defense Zone was selected to protect homes in the community from a wildfire initiating on LTBMU land and burning into the community. The predominant southwest wind in the Fallen Leaf Lake area would drive a wildfire from LTBMU recreational use land into the community. The Defense Zone would protect the community.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

First

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

FL5 is located south of Fallen Leaf Lake and is in the southern most portion of the Eastside community.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the over story unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 100 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

***Stream Environment Zones Prescription:** Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.*

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: *Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.*

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. Chips scattered throughout the project area will not exceed four inches in depth.*

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classification 1A. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classifications and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area.

Mechanical Operations are required for the cost effective completion of this project. Over the snow operations may be an option.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$4,600 per acre
\$4,600 x 28 acres = \$128,800

Total = \$128,800

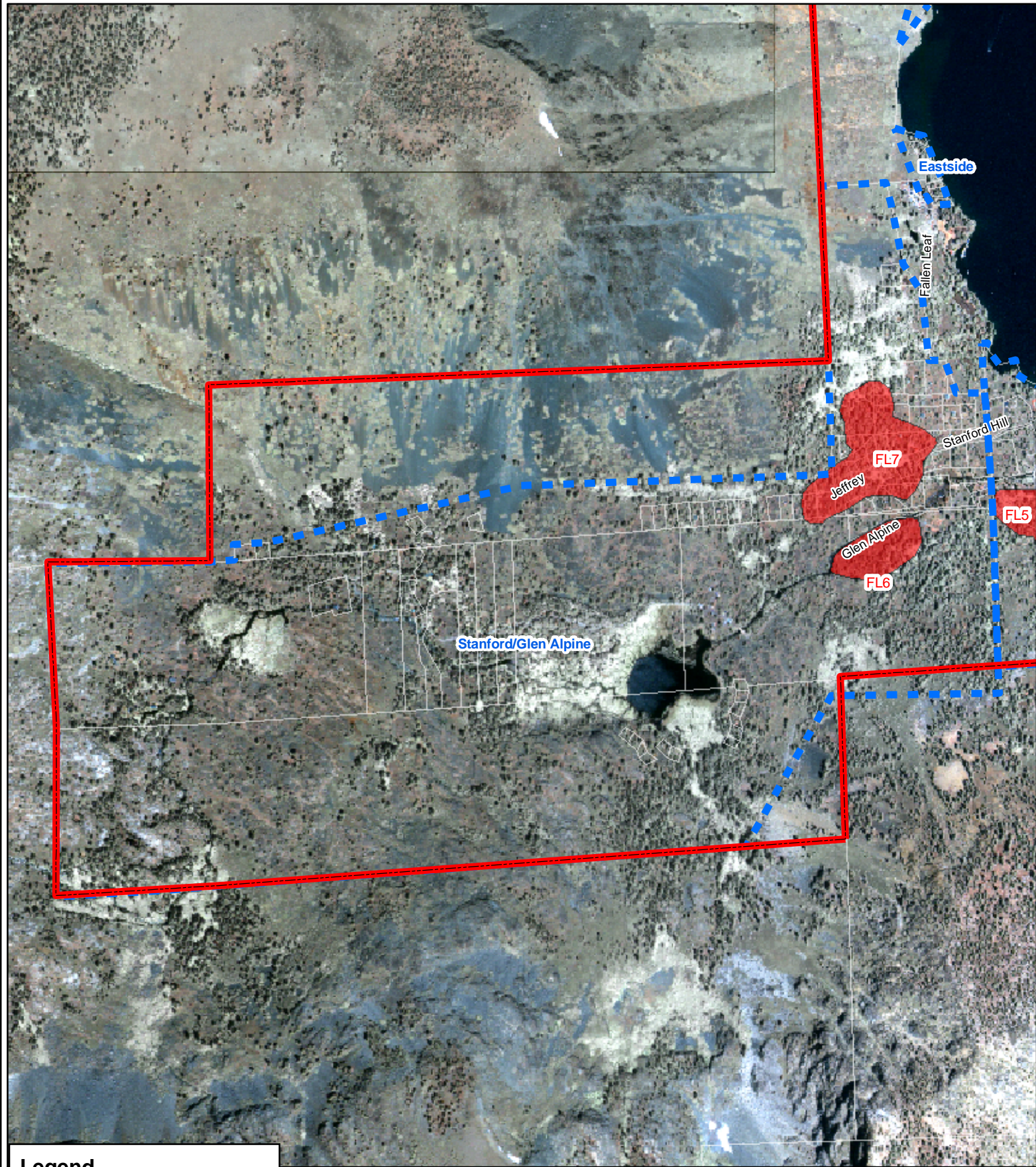
Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.





Legend

- Proposed Project
- Fire Behavior Sample Location
- Community
- Fire Department Service Area

Figure 7.
Proposed Projects Stanford/Glen Alpine



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Fallen Leaf

Name of Community: Stanford/Glen Alpine

Date: November 2004

Project Title: Fallen Leaf 6 – FL6

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project is a NFFL fuel model 10. A fire in the project area would have a rate of spread of 300 feet per hour with flame lengths of 4 to 6 feet. The type of fire would be a high intensity surface fire due to heavy fuel loading on the surface and dense ladder fuels. There is the potential for a crown fire.*

***Tactical decision for Project:** Defense Zone was selected to protect homes in the community from a wildfire initiating on LTBMU land and burning into the community. The predominant southwest wind in the Fallen Leaf Lake area would drive a wildfire from LTBMU recreational use land into the community.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

First

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

FL6 is located northeast of the Sanford/Glen Alpine community and is south of FL 7.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the over story unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

***Stream Environment Zones Prescription:** Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.*

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

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. Chips scattered throughout the project area will not exceed four inches in depth.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classification 1C. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classifications and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area.

Mechanical operations are required for the cost effective completion of this project. Over the snow operations may be an option.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$2,500 per acre

\$2,500 x6 acres = \$15,000

Total = \$15,000

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Fallen Leaf

Name of Community: Sanford/Glen Alpine

Date: November 2004

Project Title: Fallen Leaf 7 – FL7

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project is a NFFL fuel model 10. A fire in the project area would have a rate of spread of 300 feet per hour with flame lengths of 4 to 6 feet. The type of fire would be a high intensity surface fire due to heavy fuel loading on the surface and dense ladder fuels. There is the potential for a crown fire.*

***Tactical decision for Project:** Defense Zone was selected to protect homes in the community from a wildfire initiating on LTBMU land and burning into the community. The predominant southwest wind in the Fallen Leaf Lake area would drive a wildfire from LTBMU recreational use land into the community.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

First

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

FL 7 is located in the northwest of the Sanford/Glen Alpine community and is north of FL 6.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the over story unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

***Stream Environment Zones Prescription:** Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.*

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

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. Chips scattered throughout the project area will not exceed four inches in depth.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classifications 1A and 1C. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classifications and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area.

Mechanical Operations are required for the cost effective completion of this project. Over the snow operations may be an option.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$4,600 per acre
\$4,600 x 15 acres = \$69,000

Total = \$69,000

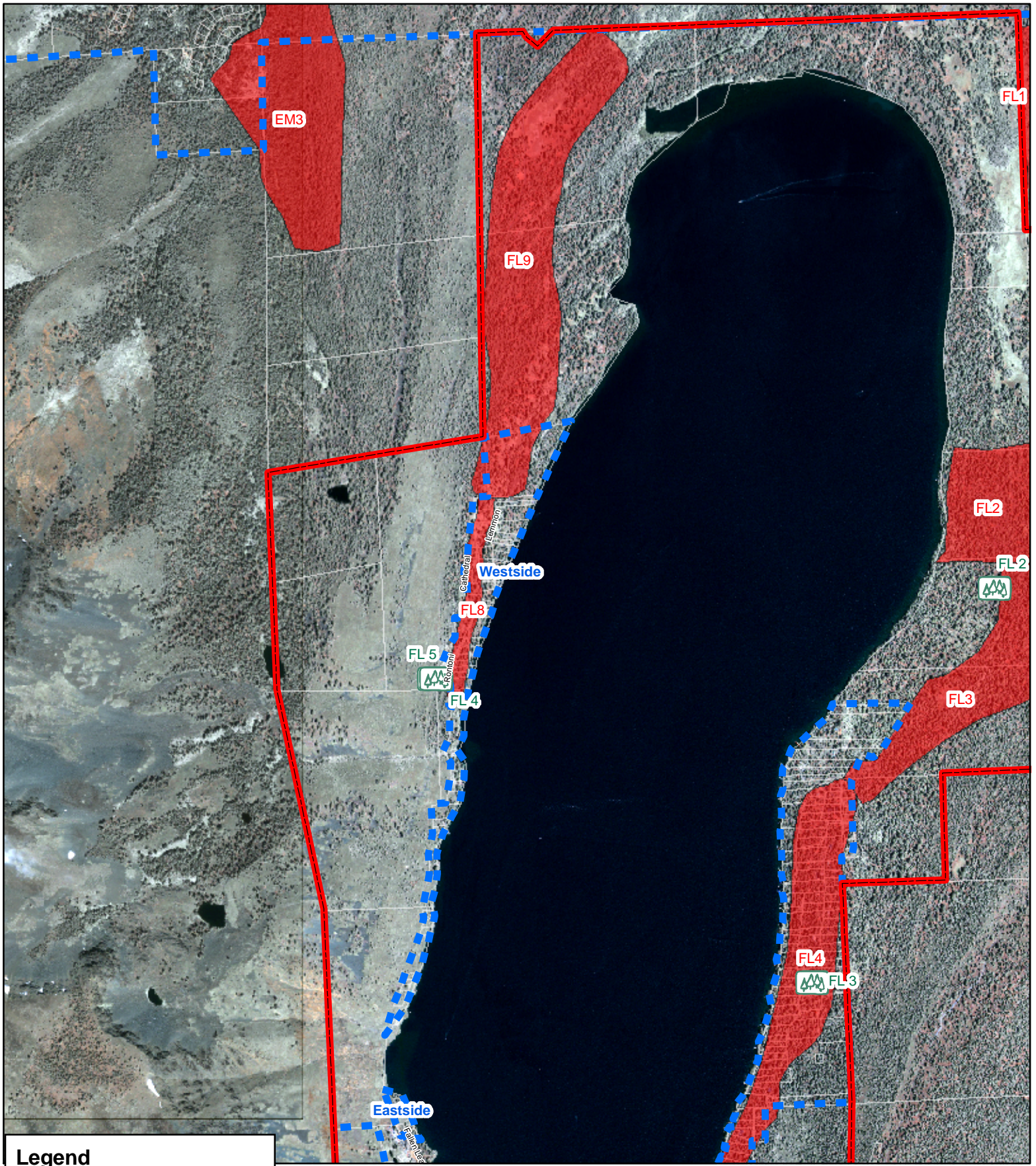
Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.





Legend





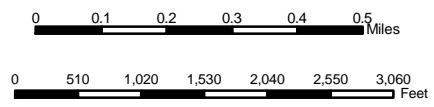
-  Proposed Project
-  Fire Behavior Sample Location
-  Community
-  Fire Department Service Area

Figure 8.
Proposed Projects Westside



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Fallen Leaf

Name of Community: Westside

Date: November 2004

Project Title: Fallen Leaf 8 – FL8

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project area is NFFL fuel model 5. A fire in the area would have a rate of spread of 790-1500 feet per hour with flame lengths of 3 to 6 feet, on a southern exposure. The type of fire would be a high intensity surface brush fire.*

***Tactical Decision for Project:** Roadside protection was selected to provide protection to the road and the structures along the road to protect the community from a fire initiating to the west or north and entering the community.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Fourth

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

FL8 is located in the northern portion of the Westside community.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

Roadside Protection

Roadside protection would occur within a corridor that extends up to 100 feet out from either side of the road. This treatment is designed to protect evacuation routes for community residents and provide safety for firefighters entering a community to provide protection in the event of a wildfire. Brush and shrubs would have a spacing of 3 times the height of the residual plants and be removed immediately adjacent to the road to keep flames from directly impinging the roadway. Spacing between trees would be at least 20 feet between crowns of residual trees, with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. Trees immediately adjacent to the road would be few. Flamelengths would be less than 2 feet, with enough clearance to keep flames from traveling directly across the roadway.

Vegetation removal techniques may be by a combination of mechanical thinning, hand thinning, piling and burning, chipping, prescribed burn, and/or mastication. Mastication is the preferred method since it leaves the treated fuel material on-site. Leaving the treated material is particularly desirable on road shoulders to cover bare soil for erosion control.

***Thinning:** Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.*

Hand Piling and Burning. All cut material and dead and down material greater than 3 inches in diameter and up to 14 inches diameter shall be piled for burning. Piles shall be constructed compactly beginning with a core of fine fuels and minimizing air spaces to facilitate complete combustion. Piles will be constructed at least 1.5 times the diameter of the pile from residual trees and no taller than five feet to prevent damage when burning. If the area will not be broadcast burned, then each pile will be lined with a wet or hand fire line. At least one half of each pile will be covered with water resistant burnable paper to cover the fine material in the center of the piles.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classifications 1A and 1C. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classifications and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Roadway Clearance \$800 per acre
\$800 x 12 acres = \$9,600 **Total = \$9,600**

Project Maintenance Requirements:

Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Fallen Leaf

Name of Community: Westside

Date: November 2004

Project Title: Fallen Leaf 9 – FL9

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project area is an NFFL fuel model 9. A fire in this area would have a rate of spread 250 to 400 feet per hour and flame lengths of 1 to 3 feet on a southern exposure. The type of fire would be a moderate intensity surface fire with tree torching in areas of high surface and ladder fuels.*

***Tactical decision for Project:** The defense zone was selected to protect the community to the west of the project area and to provide safe ingress and egress. Evacuation of residents and ingress of firefighters is a critical concern during a fire event.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Third

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

FL9 is northwest of Fallen Leaf Lake.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel, removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the over story unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

***Stream Environment Zones Prescription:** Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.*

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

Hand Piling and Burning. All cut material and dead and down material greater than 3 inches in diameter and up to 14 inches diameter shall be piled for burning. Piles shall be constructed compactly beginning with a core of fine fuels and minimizing air spaces to facilitate complete combustion. Piles will be constructed at least 1.5 times the diameter of the pile from residual trees and no taller than five feet to prevent damage when burning. If the area will not be broadcast burned, then each pile will be lined with a wet or hand fire line. At least one half of each pile will be covered with water resistant burnable paper to cover the fine material in the center of the piles.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classification 1A. The current proposed prescription of mechanical treatment in conflict with the operational constraints within Bailey Landuse Classifications and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area. During detailed project planning, the use of mechanical techniques can be allocated to appropriate locations is the project.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive, vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$2,500 per acre
\$2,500.00 x 107 acres = \$267,500

Total = \$267,500

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Fallen Leaf

Name of Community: Fallen Leaf

Date: November 2004

Project Title: Community Defensible Space Program

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** Numerous private lots within the FLFD area contain hazardous wildland fuels. These fuels pose a hazard to structures located on the lots or adjacent lots. Significant structure loss will result from the proximity of wildland fuels during a wildfire event.*

***Tactical decision for Project:** The FLFD would like to provide landowners assistance in establishing effective defensible space around structures.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

All private land lots less than 2 acres within the Fallen Leaf Fire Department service area

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

Urban Lots

Fuels treatment on urban lots are generally conducted by hand thinning and designed to remove excessive fuels, thereby altering fire behavior and reducing the ability of a wildfire to move to neighboring lots. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. Urban lots will have about 40% canopy cover and will be approximately 110 to 150 sq ft basal area. On steep slopes, tree spacing may be increased. The Living with Fire in the Tahoe Basin guidelines should be used in creating effective defensible space.

Urban lot prescriptions are accomplished through a specific combination of thinning with either pile burning or chipping as the disposal method. Implementation of the prescriptions is unique given the proximity to structures and the relatively easy access to the forest stand. Though hand thinning has been the favored treatment technique, mechanical thinning and mastication with small machines should be evaluated as an alternative cost-effective method of treating urban fuels.

***Urban Lot Prescription.** Reduce the potential for crown fires by increasing the crown base height to at least 20 feet. Starting with the smallest diameter class and remove suppressed and intermediate trees to achieve the prescribed crown base height and tree spacing. Remove ground fuels greater than three inches diameter and treat shrub densities to achieve flame lengths of no more than two feet. Dispose of biomass material through chipping.*

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a Bailey Land Classifications 1A. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classifications. The Bailey Land Class should be ground verified to ensure they apply to the project area.

Mechanical equipment can be limited to the roadway, with hand crews pulling material to the edge of the road for disposal.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Communtiy Defensible Space \$2,500 per acre
\$2,500 x82 acres = \$206,000 **Total = \$206,000**

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated by hand or with mechanical means every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.

2. LAKE VALLEY FIRE PROTECTION DISTRICT

2.1 Demographics, location, topography, and climatic data

The Lake Valley Fire Protection District (LVFPD) is a special district that was formed in 1947 to provide fire protection along the south shore of Lake Tahoe, California. The District serves the community of Meyers, an area of approximately 83 square miles. Additionally, the District's Mutual Aid responsibilities cover the City of South Lake Tahoe, and portions of Alpine and El Dorado counties (Figure 9). A summary of land management in the District's service area is provided in Table 14.

Table 14. Land Management Acreage within the LVFPD

Land Administrator	ACRES
State of California	1,280
LTBMU	12,800
Private/Municipal	39,040
Total	53,120

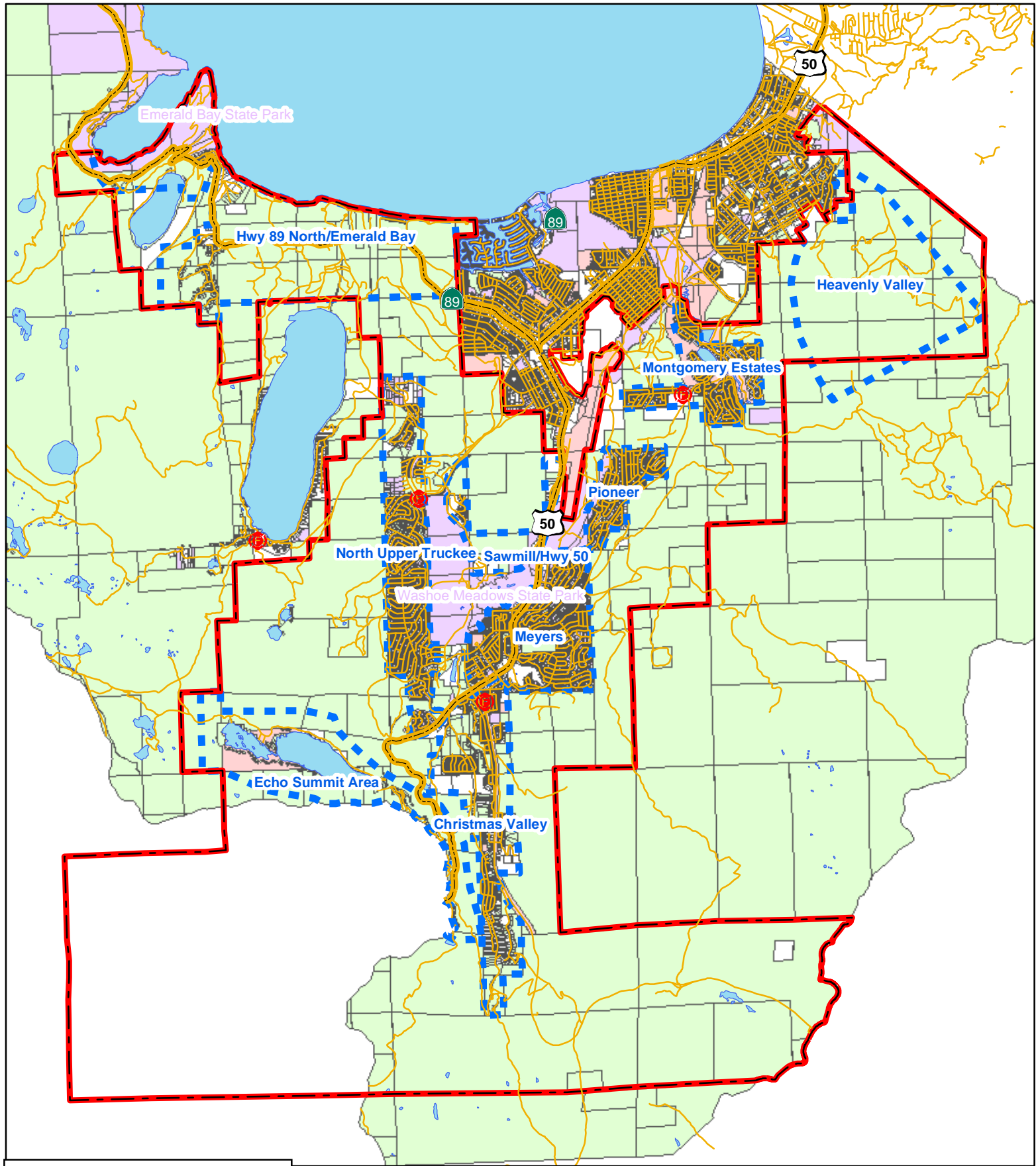
Source: TRPA GIS Databases

LVFPD provides fire, rescue, and emergency medical services to a permanent population of approximately 12,500 people, with seasonal tourist fluctuations that swell the population to over 40,000. The economy in the area is based primarily on tourism. Skiing, snowboarding, camping, hiking, mountain biking, fishing, and summer water sports bring thousands of tourists from to the area from all over the world each year.

Elevations within the LVFPD range from 6,225 feet above mean sea level at Lake Tahoe to nearly 9,735 feet at Mt. Tallac, west of South Lake Tahoe. The area is cut by several steep drainages, with the Upper Truckee River being the largest. The Upper Truckee River is the largest tributary to Lake Tahoe.

In over 50 years of recorded weather history in the Lake Tahoe Basin, 80 percent of the days have had sunshine (South Lake Tahoe Chamber of Commerce 2004). Any given year will provide approximately 240 cloudless days and another 75 days when both sunshine and clouds are recorded. The remaining 50 days provide the Sierra's famous snow pack and just a little bit of rain.

The Lake Tahoe Basin's average daily high temperatures in December, January, and February are 40, 37, and 39 degrees Fahrenheit, respectively. The summer season is as dry and sunny as anywhere in the arid desert southwest. Spring and fall temperatures are very similar, as are both seasons' rainfall figures. The March, April, and May period averages somewhat cooler temperatures and more precipitation than the fall. Rainfall is usually recorded 14 days out of spring's 90-day period and on 13 days in autumn. The average rainfall for the Lake Tahoe Basin is 31 inches (Lake Tahoe Visitors Authority 2004).



Legend











Owner			
	Private		Community
	Federal		Fire District
	Local		Lake
	State	Roads	
	Fire Station		Paved/Gravel
			Highways

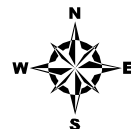
Figure 9.

Lake Valley Fire Protection District

0 1 2 3 4 5 Miles

GEOARCH SCIENCES INC.
INFORMATION AND RESOURCE MANAGEMENT

Geoarch Sciences has made every effort to accurately compile the information depicted this map, but cannot warrant the reliability or completeness of the source data.



2.2 Fire District Overview

Wildfire Protection Resources

Wildland firefighting suppression resources in close proximity to Lake Valley Fire Protection District include the following agencies:

- Lake Valley Fire Protection District
- El Dorado County Fire Department
- South Lake Tahoe Fire Department (SLTFD)
- Fallen Leaf Fire Department (FLFD)
- Meeks Bay Fire Department
- Tahoe-Douglas Fire Protection District (TDFPD)
- Carson City Fire Department
- North Lake Tahoe Fire Protection District
- North Tahoe Fire Protection District
- Lake Tahoe Regional Fire Chiefs Association Mutual Aid Agreement
- US Forest Service Lake Tahoe Basin Management Unit (LTBMU)
- Nevada Division of Forestry (NDF)
- East Fork Fire and Paramedic Districts

The District is signatory to the Lake Tahoe Regional Fire Chiefs Mutual Aid Agreement, enabling the District to give and receive mutual aid from over thirty additional fire departments in the region. The LVFPD and the USFS are the primary agencies that respond to wildfires in the LVFPD.

LVFPD is a combination paid and volunteer District with 23 full-time and 20 volunteer personnel. LVFPD hires an additional three to five firefighters during the fire season. These seasonal firefighters are part of LVFPD's fuels reduction program and are available to respond to wildland fires. A five-member board of directors meets once a month to govern the LVFPD.

Wildfire resources may be supplied from any one or more of the district's three fire stations. A variety of equipment resources are available for fighting wildfires. They include:

- 4 Type 1 Engines
- 2 Type 3 Engines
- 1 Type 1 Tender
- 3 Chief Officers

Source: Fire Chief Brian Schafer, Lake Valley Fire Protection District 9-2004 and LTRFC Mobilization Guide

Water Sources and Infrastructure in the District

There are numerous water storage tanks throughout the district. Fire hydrants are spaced within 500 feet of structures. Water sources are either gravity fed or powered by electric pumps with emergency back-up generators. With few exceptions, the South Lake Tahoe

Public Utility District is the primary water purveyor within the Tahoe Basin portion of the District. Barring water system infrastructure failures, available hydrant flows within STPUD's service area are more than adequate to provide required water for wildland fire suppression and structure protection. Additionally, the lake provides an ideal source for helicopter bucket dips.

Fire Protection Personnel Qualifications

All of the LVFPD firefighters have a minimum of California State Fire Marshal Firefighter I training, wildland firefighting training (S110, 130, 190), and ICS 300. Full-time staff have completed the following additional training (or equivalent): most company officers have completed SFM Company Officer, Strike Team Leader, Command 2E certifications. Chief officers are red carded to Division/Group supervisor level or higher.

LVFPD Detection and Communication

Fires are reported in the LVFPD to the dispatch facility in South Lake Tahoe primarily through the 911 telephone system. Fires are communicated to fire response personnel through the use of radios and pagers. The radio system is compatible with neighboring agencies and there are no known gaps in radio coverage. Because of the large population and high recreational use in non-populated areas, most fires are detected while they are small. There are no fire lookouts, patrols, or reconnaissance flights.

Work Load

In 2003, LVFPD responded to 1,400 calls, of which 114 were fires.

Financial Support

The LVFPD was established under California Health and Safety Code Section 13979. The District is funded primarily through a combination of property tax, development fees, and ambulance revenue.

2.3 Community Preparedness

The LVFPD has several pertinent plans that serve as a foundation for emergency operations. They include the following:

- Emergency Plan for hazardous materials;
- Pre-attack Plan for response to incidents with the district;
- Wildland Fire Standard Operating Procedures;
- Community Fire Plan (work in progress); and,
- Emergency Evacuation Plan (work in progress).

The District has adopted the 1997 Uniform Fire Code and reviews development plans to ensure compliance it. The district is in the process of adopting the 2001 Uniform Fire Code. The District has a complaint-driven PRC 4291 inspection and enforcement program.

El Dorado County has adopted building ordinances requiring non-flammable roofing materials be used on new construction. Wood shake roofs, even treated with retardant are not allowed.

2.4 Hazard Assessment and Mitigation Projects

The Lake Valley Fire Protection District is divided into eight communities (each with its own neighborhoods) to assess the structural ignitability and hazards within the district. The communities are:

- Christmas Valley
 - South Upper Truckee Neighborhood
 - Kekin/Henderson-Tahoe Paradise #60 Neighborhood
 - Hwy 89 South Neighborhood
 - Grass Lakes Road Neighborhood
- Meyers
 - Upper Apache/Mandan Neighborhood
 - Lower Apache Neighborhood
 - Elks Club/Skyline Neighborhood
- Pioneer
 - Gleneagles/Wintoon/Jicarilla Neighborhood
- Montgomery Estates
 - Golden Bear Neighborhood
 - Cattlemans Neighborhood
 - Black Bart Neighborhood
 - Marshall/Sierra House Neighborhood
 - Cold Creek Neighborhood
- Sawmill/Highway 50
 - Echo View Estates Neighborhood
 - Sawmill Road Neighborhood
- North Upper Truckee
 - Chiappa Neighborhood
 - North Upper Truckee/Lake Tahoe Blvd Neighborhood
 - Angora Highlands Neighborhood
- Heavenly Valley
- Highway 89N/Emerald Bay
 - Camp Richardson Area Neighborhood
 - Spring Creek Neighborhood
 - Cascade Lake Neighborhood
 - Cascade Properties Neighborhood

Structural Ignitability

LVFPD personnel conducted an assessment of building materials and defensible space within the communities. The results of this survey are provided in Table 15.

Table 15. Structural ignitability factors for the Communities served by the LVFPD.

Percentage of Lots and Homes				
Community/ Neighborhood		Without Defensible Space	With Flammable Unenclosed Structures	Structural Rating
Christmas Valley				
	South Upper Truckee	43%	44%	Low
	Kekin/Henderson-Tahoe Paradise 60	72%	70%	Low
	Hwy 89 South	21%	48%	Low
Meyers				
	Upper Apache/Mandan	85%	58%	High
	Lower Apache	72%	88%	High
	Elks Club/Skyline	75%	59%	High
Pioneer				
	Gleneagles/Wintoon/Jicarilla	68%	79%	Moderate
Montgomery Estates				
	Golden Bear	94%	91%	Moderate
	Cattlemans	97%	93%	Moderate
	Black Bart	85%	79%	Moderate
	Marshall/Sierra House	46%	47%	Moderate
	Cold Creek	92%	89%	Moderate
Sawmill/Highway 50				
	Echo View Estates	66%	97%	High
	Sawmill Road	42%	94%	High
North Upper Truckee				
	Chiappa	58%	84%	Moderate
	N. Upper Truckee/Lake Tahoe Blvd	66%	90%	Moderate
	Angora Highlands/Tahoe Mountain	81%	88%	Moderate
Highway 89 North/Emerald Bay				
	Camp Richardson Area	12%	5%	High
	Spring Creek	18%	15%	High
	Cascade Lake	62%	63%	High
	Cascade Properties	14%	14%	High

The number of homes with flammable roofs, flammable siding, unenclosed structures (which can trap embers) and inadequate defensible space was tallied. The results of the structural ignitability assessment illustrate the need for homeowners to address building materials and defensible space around their homes. In general, most structures do not have both appropriate roofing and siding materials. The majority of structures have decks and overhanging unenclosed features where embers can be trapped and ignite a home. Defensible space is also lacking around most structures.

The Living with Fire in the Tahoe Basin guidelines illustrates the dangers of flammable building materials and inadequate defensible space. Burning embers from a wildfire can land on or become trapped in cracks in roofing and siding material, causing the fire to spread to the home. Unenclosed structures allow burning embers and heat to become trapped, also spreading the fire from the wildland to the home. Direct flame contact to the home due to lack of defensible space will also result in the loss of a home. All of these factors put homes at a higher risk of destruction during a wildfire event.

Any one of these building materials and construction issues could result in the loss of a home during a fire event. Simply replacing a shake roof does not provide appropriate protection if other building material issues are lacking. For structure defense to be effective, all building materials must be non-flammable and openings that trap embers must be closed. Residents can contact the LVFPD for guidance on appropriate building materials and construction issues.

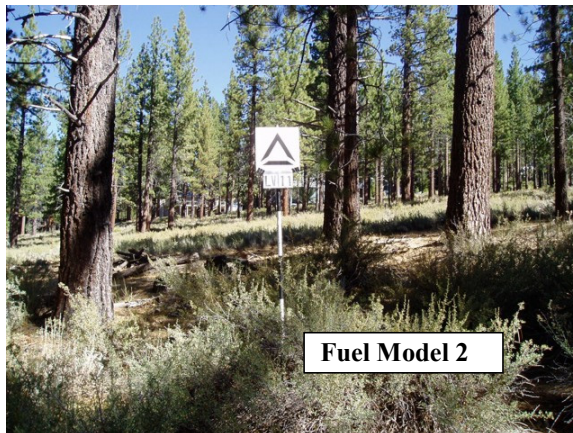
Fire Behavior Analysis

Twelve forest sampling plots were recorded in the Lake Valley Fire Protection District communities to use in fire behavior modeling.

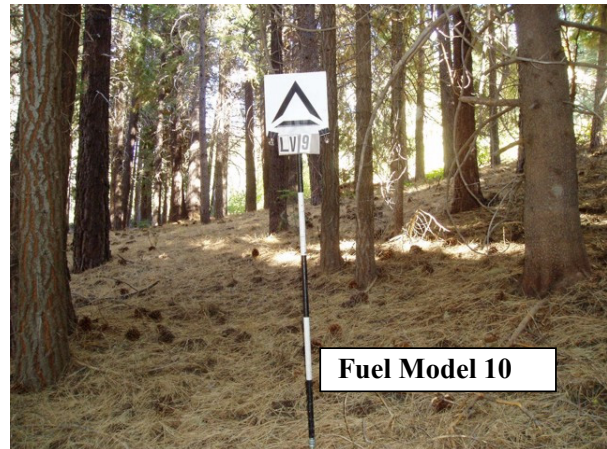
Table 16: Fire Behavior Analysis

Community	Plot Number	Fuel Model	Canopy Base Height	Basal Area	Flame length (feet)	Rate of Spread (feet per hour)	Fire Type
Highway 89 North/ Emerald Bay	LV 1	10	4	83	6.7	798	Passive Crown
	LV 2	12	8	875	5.9	594	Wind Driven Active Crown
North Upper Truckee	LV 3	9	22	37	2.1	400	Surface Fire
	LV 4	9	1	129	2.3	356	Passive Crown
	LV 6	10	1	260	3.4	336	Passive Crown
Heavenly Valley	LV 5	10	1	212	5	554	Passive Crown
Meyers	LV 7	10	1	298	3.5	356	Passive Crown
	LV 9	10	2	208	3	257	Passive Crown
	LV 13	10	1	180	3	257	Passive Crown
Christmas Valley	LV 8	12	6	873	6.1	640	Passive Crown
Montgomery Estates	LV 10	10	1	118	3	257	Passive Crown
	LV 11	2	7	200	6.8	1600	Passive Crown
Sawmill/ Highway 50	LV 12	2	4	143	4.1	1300	Passive Crown

Photographic examples of the different fuel models found in the LVFPD follow. All of the fire behavior sample plots have fuel loadings, fire behavior, and forest stand characteristics that exceed the objectives established earlier in this document. The fire behavior characteristics vary greatly in the LVFPD and represent some of the worst fire behavior potential in the Tahoe Basin.



Fuel Model 2

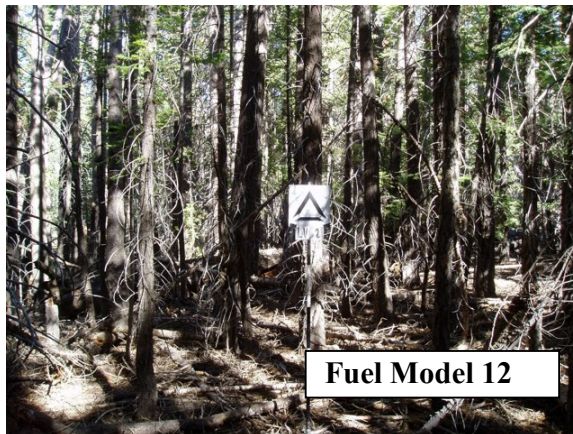


Fuel Model 10

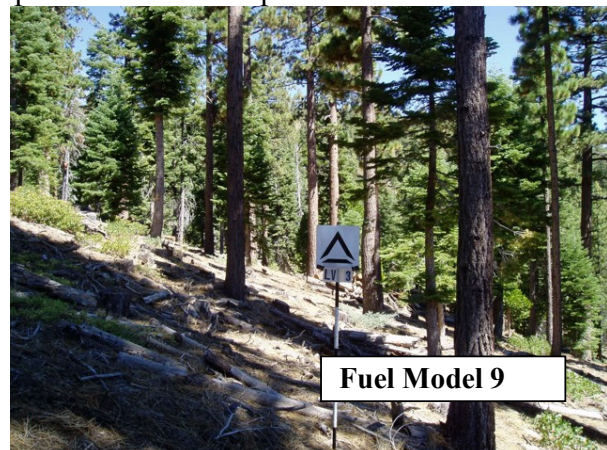
Two sample plots represent fuel model 2, a grass fuel model (see photo to left). Flame lengths can be significant from these fuel models with the fastest rates of spread. Both sample sites indicate rates of

spread over 1000 feet per hour, indicating a fire can overtake a community quickly.

The remaining sample sites demonstrate timber type fuel models, with significant flame lengths and rates of spread. All have at least a passive crown fire potential. Two sites are particularly concerning, LV2 and LV6 which are fuel model 12 (see photo at bottom left). Note large flame lengths and rates of spread associated with these sites, including the wind driven active crown fire classification for LV2. This site represents some of the worst fire behavior in the Basin.



Fuel Model 12



Fuel Model 9

The community is summer homes, with poor road widths and a single access route in and out of the community. Simply evacuating the community safely will be a challenge.

In addition to the elements addressed in the structural ignitibility section, fire district personnel evaluated the Meeks Bay communities on a number of other criteria including slope, aspect, community design, and fire suppression infrastructure. Combined with the results of the structural assessment, each community was given a community rating.

Table 17: Assessment Measures

Community/ Neighborhood		Structural Assessment	Fire Behavior Rating	Neighborhood Assessment
Christmas Valley				
	South Upper Truckee	Low	Moderate	Moderate
	Kekin/Henderson-Tahoe Paradise 60	Low	Moderate	Moderate
	Hwy 89 South	Low	Moderate	Moderate
Meyers				
	Upper Apache/Mandan	High	Moderate	High
	Lower Apache	High	Moderate	High
	Elks Club/Skyline	High	Moderate	High
Pioneer				
	Gleneagles/Wintoon/Jicarilla	Moderate	Extreme	High
Montgomery Estates				
	Golden Bear	Moderate	Extreme	High
	Cattlemans	Moderate	Extreme	High
	Black Bart	Moderate	Extreme	High
	Marshall/Sierra House	Moderate	Extreme	High
	Cold Creek	Moderate	Extreme	High
Sawmill/Highway 50				
	Echo View Estates	High	Extreme	Extreme
	Sawmill Road	High	Extreme	Extreme
North Upper Truckee				
	Chiappa	Moderate	Moderate	Moderate
	N. Upper Truckee/Lake Tahoe Blvd	Moderate	Moderate	Moderate
	Angora Highlands/Tahoe Mountain	Moderate	Moderate	Moderate
Highway 89 North/Emerald Bay				
	Camp Richardson Area	High	Moderate	High
	Spring Creek	High	Moderate	High
	Cascade Lake	High	Moderate	High
	Cascade Properties	High	Moderate	High

2.5 Mitigation Measures

Residents and Landowners

Residents and private landowners are the most effective group in mitigating wildfire hazards. Defensible space, building materials, and home construction guidelines are designed to reduce the risk of structure loss during a wildfire to less than 1%, according to *Living with Fire in the Tahoe Basin* publication (Smith 2004). If implemented, almost all structures within a community will survive a wildfire even if no community mitigation projects have been implemented. Landowners must take an active role in addressing these hazards on their property.

The results of the structural assessment conclude that most homes need to improve some component of defensible space, building materials, or home construction. California Public Resources Code 4291 (PRC 4291) requires homeowners to address wildland fire hazards through creation of defensible space and other building construction mitigation measures. Specifically, the code requires homeowners to:

- Maintain adequate defensible space 30 feet around structures (this will increase to 100 feet January 1, 2005)
- Remove that portion of any tree which extends within 10 feet of the outlet of any chimney or stovepipe.
- Maintain any tree adjacent to or overhanging any building free of dead or dying wood.
- Maintain the roof of any structure free of leaves, needles, or other dead vegetative growth.
- Provide and maintain at all times a screen over the outlet of every chimney or stovepipe that is attached to any fireplace, stove, or other device that burns any solid or liquid fuel. The screen shall be constructed of nonflammable material with openings of not more than one-half inch in size.

Use of appropriate building materials is another important mitigation measure homeowners can address. Homeowners are required, through El Dorado County Building Code, to install non-flammable roofs when constructing their homes. Wood shake shingles, even treated, are not allowed. While this code does not apply to existing homes, the fire safe message is clear; use nonflammable building materials. Even is not required by law, homeowners should use non-flammable materials on the outside of their homes. Homeowners with wood shake roofs should have their roofs replaced with non-flammable material. Insurance companies are increasing premiums or in some cases refusing to renew policies for homes with flammable roofing material.

To address these issues, residents must educate themselves on the *Living with Fire in the Tahoe Basin* guidelines and review their property for needed improvements (Smith 2004). If residents have questions regarding the information, they should contact their local fire district to review their property and provide guidance.

The *Living with Fire in the Tahoe Basin* guidelines provide significant detail regarding the spacing and removal of trees and shrubs from around the homes (Smith 2004). Recommended spacing are commonly a minimum, residents may wish to remove more

vegetation where regulations allow. On vacant lots and in the defense zone on their properties residents and landowners should provide at least 10 feet of spacing between trees, greater distances on slopes over 20%. When choosing which trees and shrubs to remove on their property, preference should be given to those individuals that are smaller and suppressed. Removal of this vegetation is less likely to require permits than larger trees and leaves the more desirable trees.

Maintaining defensible space is a continuous process. Annually residents and landowners should re-evaluate their property to ensure proper defensible space criteria are met.

Community Defensible Space Program

To assist local landowners with disposal of the biomass material generated by creating defensible space, the LVFPD and Tahoe Basin Fire Safe Council must continue the community defensible space program. Demand for the program is positive and most programs rely on grant funding to operate. Additional grant funding should be secured to continue this program.

Assuming a 100% participation rate of properties under 2 acres, the cost estimate for the community chipper program in LVFPD is \$4,188,000.

Fuels Reduction Projects

To address the community hazards a number of mitigation projects were developed. Fuels reduction projects are designed to address the fuel hazards within and around the communities. Where possible, projects address not only the fuel hazard objectives, but also forest and stream environment zone health objectives. The projects are described in detail in the following section.

Developing project priorities is a critical element of the community wildfire protection plan. Priorities were developed using a combination of the available datasets as criteria, including the urban values at risk (Murphy and Knopp 2000), community hazard ratings, fire behavior ratings, project type, and completed treatments in the area. The consultant team rated each of the projects according to the above elements. The fire chief made final adjustments to the ratings based on district specific knowledge.

Prioritizing the top projects in a district fairly clear. Fire professionals across all agencies typically agree on the areas in most dire need of treatment in each district. Prioritizing the projects in the middle can be difficult. A variety of factors can be considered in the prioritization, many canceling the effects of others. Using the five criteria outlined above provided a sound method for project prioritization.

In addition to the projects outlined in this plan, the project work proposed by the LTBMU is also identified. LTBMU staff provided GIS datasets mapping the areas they expect to treat within the next 10 years around communities. These project areas were not included in mitigation projects proposed in this plan and are instead called out separately. Specific prescriptions and treatments have not been identified for these areas, so a uniform cost

actor of \$2,500 per acre was used to calculate the total cost for LTBMU projects within the WUI.

Table 18: Summary of Projects, Lake Valley Fire Protection District

Priority	Project Name	Project Type	Project Acres	Total Project Cost
1	EM3	Defense Zone	122	561,200
2	EM1	Defense Zone	49	225,400
3	ME1	Defense Zone	496	1,240,000
3	ME2	Urban Lot	41	167,075
3	ME3	Urban Lot	29	118,175
4	P1	Defense Zone	20	50,000
5	MEY1	Defense Zone	73	335,800
5	MEY3	Defense Zone	34	85,000
5	MEY4	Defense Zone	29	72,500
6	MEY2	Defense Zone	242	1,113,200
6	MEY5	Urban Lot	193	786,475
7	EM4	Defense Zone	180	828,000
7	NUT1	Defense Zone	208	520,000
7	NUT2	Defense Zone	78	358,800
7	SAW1	Defense Zone	120	300,000
8	NUT3	Urban Lot	11	44,825
8	NUT4	Urban Lot	3	12,225
8	NUT5	Defense Zone	70	322,000
8	NUT6	Urban Lot	298	1,214,350
8	NUT7	Urban Lot	28	114,100
9	CV1	Defense Zone	76	190,000
9	CV2	Defense Zone	14	64,400
9	CV3	Meadow Restoration	54	64,800
9	CV4	Roadside Protection	19	15,200
9	EM2	Roadside Protection	128	102,400
9	HV1	Defense Zone	53	243,800
Total Cost for Wildfire Protection Plan Projects				\$9,149,725

		Community Defensible Space Program		4,188,000
Total Cost for Community Defensible Space Program				\$4,188,000

		Project Proposed by LTBMU in the WUI		7,041,580
Total Cost for Project Proposed by LTBMU				\$7,041,580

Summary of all Project Costs \$20,379,305

The allocation of proposed projects by community and major landowner is summarized below in Table 19.

Table 19: Allocation of Proposed Hazard Mitigation Projects across Ownership

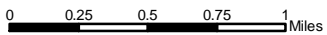
Fire District	Landowner						Total Acres
	LTBMU by Fire District	Future LTBMU	California State Parks	California Tahoe Conservancy	Local Agency	Private	
Lake Valley	1,601	4,750	104	632	56	2,107	9,250



Legend

- Proposed Project
- 🌲 Fire Behavior Sample Location
- Community
- Neighborhood

Figure 10.
Proposed Projects Hwy 89 North/Emerald Bay



Risk/Hazard Identification and Mitigation Project Worksheet

Fire District: Lake Valley

Name of Community: Highway 89 North/Emerald Bay **Date:** November 2004

Project Title: Highway 89 North/Emerald Bay 1-EM1

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** This project is in a NFFL fuel model 10. A fire in the project would have a rate of spread 700 to 2000 feet per hour with flame lengths 7 to 8 feet. The type of fire would be an intense surface fire with passive crowning. A southwest wind would move a wildfire quickly into the community from Highway 89.*

***Tactical Decision for Project:** A Defense Zone below CA State Hwy 89 to main road in Cascade properties would protect the community from a fire ignited south of the community or on Ca State Hwy 89. High fuel loading along the road would close access to the community for evacuation or suppression.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Second

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

EM1 is located in the northwest portion of the Highway 89/Emerald Bay community.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

***Stream Environment Zones Prescription:** Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.*

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

This project would require hand thinning across most of the area due to steep slopes. Cable yarding would be useful here.

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. Chips scattered throughout the project area will not exceed four inches in depth.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classifications 1A and 3. The current proposed prescription of hand treatment is in agreement with the operational constraints within Bailey Landuse Classifications and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Urban Lot \$4,600 per acre
\$4,600 x 49 acres = \$ 225,400

Total = \$ 22,5400

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Lake Valley

Name of Community: Highway 89 North/Emerald Bay Date: November 2004

Project Title: Highway 89 North/Emerald Bay 2-EM2

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project is in a NFFL Fuel model 10. A fire in the area would have a rate of spread 300 to 600 Feet per hour with flame lengths of 3 to 6 feet. The type of fire would be an intense surface fire with passive crowning. A southerly wind would move a wildfire quickly into Camp Richardson.*

***Tactical Decision for Project:** A Roadside protection along CA State Hwy 89 would provide for safe evacuation and ingress of fire apparatus during a fire event. High fuel loadings on either side of the road make this corridor very dangerous during a fire event.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Ninth

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

EM2 is in the southeastern portion of the Highway 89 North/Emerald Bay community.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

Roadside Protection

Roadside protection would occur within a corridor that extends up to 100 feet out from either side of the road. This treatment is designed to protect evacuation routes for community residents and provide safety for firefighters entering a community to provide protection in the event of a wildfire. Brush and shrubs would have a spacing of 3 times the height of the residual plants and be removed immediately adjacent to the road to keep flames from directly impinging the roadway. Spacing between trees would be at least 20 feet between crowns of residual trees, with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. Trees immediately adjacent to the road would be few. Flamelengths would be less than 2 feet, with enough clearance to keep flames from traveling directly across the roadway.

Vegetation removal techniques may be by a combination of mechanical thinning, hand thinning, piling and burning, chipping, prescribed burn, and/or mastication. Mastication is the preferred method since it leaves the treated fuel material on-site. Leaving the treated material is particularly desirable on road shoulders to cover bare soil for erosion control.

***Thinning:** Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.*

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. Chips scattered throughout the project area will not exceed four inches in depth.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within SEZ's. The SEZ should be ground verified to ensure they apply to the project area.

Over the snow operations may be effective for this project as much of the material to be removed is trees. In areas of brush and high surface fuels, over the snow operations will not suffice.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

*Defense Zone \$800 per acre
\$800 x 128 acres = \$102,400*

Total = \$102,400

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Lake Valley

Name of Community: Highway 89 North/Emerald Bay **Date:** November 2004

Project Title: Highway 89 North/Emerald Bay 3–EM3

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project fire behavior:** The project is a NFFL Fuel model 12. A fire in this area would have a rate of spread 600 to 1600 feet per hour with flame lengths of 6 to 9 feet. The type of fire would be an intense surface fire with high intensity Active crowning. This represents the worst conditions and fire behavior in the Tahoe Basin. Southerly wind would move a wildfire quickly into the homes.*

***Tactical Decision for Project:** Defense Zone was selected to protect homes in the Spring Creek Housing tract from a wildfire initiating on the LTBMU property to the east and burning into the community. The fuels in this zone are made up of extreme surface fuel loading greater than 90 tons per acre with a dense understory of White fir.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

First

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

EM3 is located in the southwestern portion of the Highway 89 North/Emerald Bay community.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

***Stream Environment Zones Prescription:** Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.*

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

Prescribed Burning in Forests. 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 three inches dbh. Use fire to prune ladder fuels by scorching the lower 1/3 of branches on 100% of trees less than eight inches dbh. Retain large down logs (14 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:

- six foot maximum scorch height; and,
- less than 10% mortality in conifers > 12 inches dbh.

Do not ignite fires in stream environment zones (SEZs). 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 10-hour fuels (<1 inch diameter) should be consumed in SEZs.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classifications 1A and 3. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classifications and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area.

Mechanical operations are required for the cost effective completion of this project. Over the snow operations will not mitigate heavy surface fuels.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$4,600 per acre
\$4,600 x 122 acres = \$ 561,200

Total = \$ 561,200

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Lake Valley

Name of Community: Highway 89 North/Emerald Bay **Date:** November 2004

Project Title: Highway 89 North/Emerald Bay 4-EM4

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project fire behavior:** The project is in a NFFL Fuel model 10. A fire in this area would have a rate of spread 300 to 600 feet per hour with flame lengths 3 to 6 feet. The type of fire would be an intense surface fire with passive crowning. Southerly wind would move a wildfire quickly into the homes along the west and southern edge of South Lake Tahoe and the SLT High School.*

***Tactical Decision for Project:** Defense Zone was selected to protect homes in the community from a wildfire initiating on the LTBMU property to the west and southwest and burning in to the community of South Lake Tahoe. The fuels in this zone are made up of moderate to high surface fuel loading greater than 20 tons per acre with an understory of small diameter trees.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Seventh

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

EM4 is located south of the eastern portion of the Highway 89 North/Emerald Bay community.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

***Stream Environment Zones Prescription:** Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.*

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

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. Chips scattered throughout the project area will not exceed four inches in depth.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classification 3. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classification and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area.

Mechanical operations are required for the cost effective completion of this project. Over the snow operations will not mitigate heavy surface fuels.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Urban Lot \$4,600 per acre
\$4,600 x 180 acres = \$ 828,000

Total = \$ 828,000

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



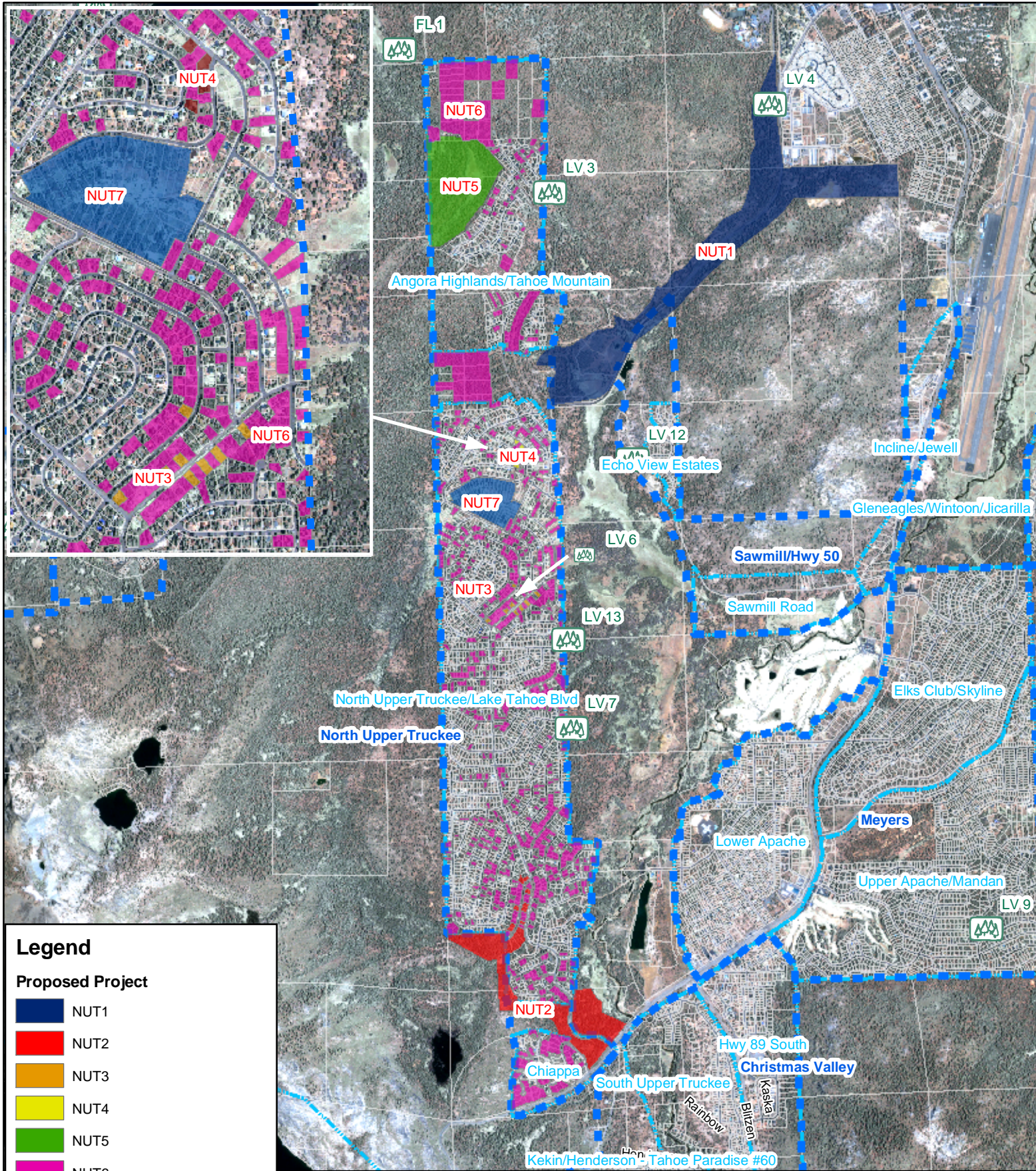


Figure 11.
Proposed Projects North Upper Truckee



0 0.25 0.5 0.75 1 Miles

Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Lake Valley

Name of Community: North Upper Truckee

Date: November 2004

Project Title: North Upper Truckee 1-NUT1

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

Pre-project Fire Behavior: *The project is in a NFFL Fuel model 10. A fire in this area would have a rate of spread 300 to 600 feet per hour with flame lengths 3 to 6 feet. The type of fire would be an intense surface fire with passive crowning. Southerly wind would move a wildfire quickly into the homes along the west and southern edge of South Lake Tahoe and the SLT High School.*

Tactical decision for Project: *Defense Zone was selected to protect homes in the community from a wildfire initiating on the LTBMU property to the west and southwest and burning in to the community of South Lake Tahoe. The fuels in this zone are made up of moderate to high surface fuel loadings greater than 20 tons per acre with an understory of small diameter trees.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Seventh

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

NUT1 is located northeast of the North Upper Truckee Community.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

Forest Stand Prescription: *Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

Brush Prescription: *Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

Stream Environment Zones Prescription: *Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.*

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

Prescribed Burning in Forests. 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 three inches dbh. Use fire to prune ladder fuels by scorching the lower 1/3 of branches on 100% of trees less than eight inches dbh. Retain large down logs (14 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:

- six foot maximum scorch height; and,
- less than 10% mortality in conifers > 12 inches dbh.

Do not ignite fires in stream environment zones (SEZs). 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 10-hour fuels (<1 inch diameter) should be consumed in SEZs.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classifications 1A, 1C, 2 and 3. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classifications and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area.

Mechanical operations are required for the cost effective completion of this project. Over the snow operations will not mitigate heavy surface fuels.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$2,500 per acre
\$2,500 x 208 acres = \$520,000

Total = \$520,000

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Lake Valley

Name of Community: North Upper Truckee

Date: November 2004

Project Title: North Upper Truckee 2-NUT2

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project is in a NFFL Fuel model 10. A fire in this area would have a rate of spread 300 to 1600 feet per hour with flame lengths 3 to 6 feet. The type of fire would be an intense surface fire with passive crowning. Southerly wind would move a wildfire quickly into the homes on the southern end of the North Upper Truckee Community.*

***Tactical decision for Project:** Defense Zone was selected to protect homes in the community from a wildfire initiating along US HWY 50 to the southwest and burning in to the community of North Upper Truckee. The fuels in this zone are made up of moderate to high surface fuel loading greater than 20 tons per acre with an understory of small diameter trees.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Seventh

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

NUT2 is located throughout the southern portion of the North Upper Truckee community.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

***Stream Environment Zones Prescription:** Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.*

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

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. Chips scattered throughout the project area will not exceed four inches in depth.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classifications 1A and 3. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classifications and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area.

Mechanical operations are required for the cost effective completion of this project. Over the snow operations will not mitigate heavy surface fuels.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$4,600 per acre
\$4,600 x 78 acres = \$ 358,800

Total = \$ 358,800

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Lake Valley

Name of Community: North Upper Truckee

Date: November 2004

Project Title: North Upper Truckee 3-NUT3

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** NFFL The project is in a NFFL Fuel model 10. A fire in this area would have a rate of spread 300 to 1600 feet per hour with flame lengths 3 to 6 feet. The type of fire would be an intense surface fire with passive crowning. Wind from any direction would move a wildfire quickly into the homes.*

***Tactical decision for Project:** Urban Lot was selected to protect homes from a fire that initiates inside the community providing protection to neighboring homes. Also provide protection inside the community from spotting fire brands from a fire outside the community.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Eighth

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

NUT3 is located in the south central portion of the North Upper Truckee community.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

Urban Lots

Fuels treatment on urban lots are generally conducted by hand thinning and designed to remove excessive fuels, thereby altering fire behavior and reducing the ability of a wildfire to move to neighboring lots. Trees spacing and ladder fuels will be the same as in the defense zone. Urban lots will have about 40% canopy cover and will be approximately 120 sq ft basal area.

Urban lot prescriptions are accomplished through a specific combination of thinning with either pile burning or chipping as the disposal method. Implementation of the prescriptions is unique given the proximity to structures and the relatively easy access to the forest stand. Though hand thinning has been the favored treatment technique, mechanical thinning and mastication with small machines should be evaluated as an alternative cost-effective method of treating urban fuels.

***Urban Lot Prescription.** Reduce the potential for crown fires by increasing the crown base height to at least 20 feet. Starting with the smallest diameter class and remove suppressed and intermediate trees to achieve the prescribed crown base height. Remove ground fuels greater than three inches diameter and treat shrub densities to achieve flame lengths of no more than two feet.*

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classifications 1A and 3. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classifications and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area. Mechanical operations can be limited to existing roadways and trails.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

*Defense Zone \$4,075 per acre
\$4,075 x 11 acres = \$44,825*

Total = \$44,825

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Lake Valley

Name of Community: North Upper Truckee

Date: November 2004

Project Title: North Upper Truckee 4-NUT4

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** NFFL The project is in a NFFL Fuel model 10. A fire in this area would have a rate of spread 300 to 1600 feet per hour with flame lengths 3 to 6 feet. The type of fire would be an intense surface fire with passive crowning. Wind from any direction would move a wildfire quickly into the homes.*

***Tactical decision for Project:** Urban Lot was selected to protect homes from a fire that initiates inside the community providing protection to neighboring homes. Also provide protection inside the community from spotting fire brands from a fire outside the community.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Eighth

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

NUT4 is located in the north central portion of the North Upper Truckee community.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

Urban Lots

Fuels treatment on urban lots are generally conducted by hand thinning and designed to remove excessive fuels, thereby altering fire behavior and reducing the ability of a wildfire to move to neighboring lots. Trees spacing and ladder fuels will be the same as in the defense zone. Urban lots will have about 40% canopy cover and will be approximately 120 sq ft basal area.

Urban lot prescriptions are accomplished through a specific combination of thinning with either pile burning or chipping as the disposal method. Implementation of the prescriptions is unique given the proximity to structures and the relatively easy access to the forest stand. Though hand thinning has been the favored treatment technique, mechanical thinning and mastication with small machines should be evaluated as an alternative cost-effective method of treating urban fuels.

***Urban Lot Prescription.** Reduce the potential for crown fires by increasing the crown base height to at least 20 feet. Starting with the smallest diameter class and remove suppressed and intermediate trees to achieve the prescribed crown base height. Remove ground fuels greater than three inches diameter and treat shrub densities to achieve flame lengths of no more than two feet.*

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classification 1C. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classification and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area. Mechanical operation can be limited to existing roadways and trails.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

*Defense Zone \$4,075 per acre
\$4,075 x3 acres = \$ 12,225*

Total = \$ 12,225

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board. Act



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Lake Valley

Name of Community: North Upper Truckee

Date: November 2004

Project Title: North Upper Truckee 5-NUT5

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** NFFL The project is in a NFFL Fuel model 10. A fire in this area would have a rate of spread 300 to 1600 feet per hour with flame lengths 3 to 6 feet. The type of fire would be an intense surface fire with passive crowning. Southerly wind would move a wildfire quickly into the homes on the southern end of the North Upper Truckee Community.*

***Tactical decision for Project:** Defense Zone was selected to protect homes in the community from a wildfire burning in to the community of North Upper Truckee. The fuels in this zone are made up of moderate to high surface fuel loading greater than 20 tons per acre with an understory of small diameter trees.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Eighth

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

NUT5 is located in the northwestern portion of the North Upper Truckee community.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

***Stream Environment Zones Prescription:** Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.*

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

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. Chips scattered throughout the project area will not exceed four inches in depth.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classification 3. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classification and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area.

Mechanical operations are required for the cost effective completion of this project. Over the snow operations will not mitigate heavy surface fuels.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$4,600 per acre
\$4,600.00 x 70 acres = \$ 322,000

Total = \$ 322,000

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Lake Valley

Name of Community: North Upper Truckee

Date: November 2004

Project Title: North Upper Truckee 6-NUT6

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** NFFL The project is in a NFFL Fuel model 10. A fire in this area would have a rate of spread 300 to 1600 feet per hour with flame lengths 3 to 6 feet. The type of fire would be an intense surface fire with passive crowning. Wind from any direction would move a wildfire quickly into the homes.*

***Tactical decision for Project:** Urban Lot was selected to protect homes from a fire that initiates inside the community providing protection to neighboring homes. Also provide protection inside the community from spotting fire brands from a fire outside the community.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Eighth

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

NUT6 is located in the northern most portion of the North Upper Truckee community.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

Urban Lots

Fuels treatment on urban lots are generally conducted by hand thinning and designed to remove excessive fuels, thereby altering fire behavior and reducing the ability of a wildfire to move to neighboring lots. Trees spacing and ladder fuels will be the same as in the defense zone. Urban lots will have about 40% canopy cover and will be approximately 120 sq ft basal area.

Urban lot prescriptions are accomplished through a specific combination of thinning with either pile burning or chipping as the disposal method. Implementation of the prescriptions is unique given the proximity to structures and the relatively easy access to the forest stand. Though hand thinning has been the favored treatment technique, mechanical thinning and mastication with small machines should be evaluated as an alternative cost-effective method of treating urban fuels.

***Urban Lot Prescription.** Reduce the potential for crown fires by increasing the crown base height to at least 20 feet. Starting with the smallest diameter class and remove suppressed and intermediate trees to achieve the prescribed crown base height. Remove ground fuels greater than three inches diameter and treat shrub densities to achieve flame lengths of no more than two feet.*

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classifications 1A and 3. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classifications and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area. Mechanical operations can be limited to existing roadways and trails.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

*Defense Zone \$4,075 per acre
\$4,075 x 298 acres = \$ 1,214,350*

Total = \$ 1,214,350

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Lake Valley

Name of Community: North Upper Truckee

Date: November 2004

Project Title: North Upper Truckee 7-NUT7

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** NFFL The project is in a NFFL Fuel model 10. A fire in this area would have a rate of spread 300 to 1600 feet per hour with flame lengths 3 to 6 feet. The type of fire would be an intense surface fire with passive crowning. Wind from any direction would move a wildfire quickly into the homes.*

***Tactical decision for Project:** Urban Lot was selected to protect homes from a fire that initiates inside the community providing protection to neighboring homes. Also provide protection inside the community from spotting fire brands from a fire outside the community.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Eighth

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

NUT7 is located in the center of the North Upper Truckee community.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

Urban Lots

Fuels treatment on urban lots are generally conducted by hand thinning and designed to remove excessive fuels, thereby altering fire behavior and reducing the ability of a wildfire to move to neighboring lots. Trees spacing and ladder fuels will be the same as in the defense zone. Urban lots will have about 40% canopy cover and will be approximately 120 sq ft basal area.

Urban lot prescriptions are accomplished through a specific combination of thinning with either pile burning or chipping as the disposal method. Implementation of the prescriptions is unique given the proximity to structures and the relatively easy access to the forest stand. Though hand thinning has been the favored treatment technique, mechanical thinning and mastication with small machines should be evaluated as an alternative cost-effective method of treating urban fuels.

***Urban Lot Prescription.** Reduce the potential for crown fires by increasing the crown base height to at least 20 feet. Starting with the smallest diameter class and remove suppressed and intermediate trees to achieve the prescribed crown base height. Remove ground fuels greater than three inches diameter and treat shrub densities to achieve flame lengths of no more than two feet.*

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classifications 1A and 3. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classifications and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

*Defense Zone \$4,075 per acre
\$4,075 x 28 acres = \$ 114,100*

Total = \$ 114,100

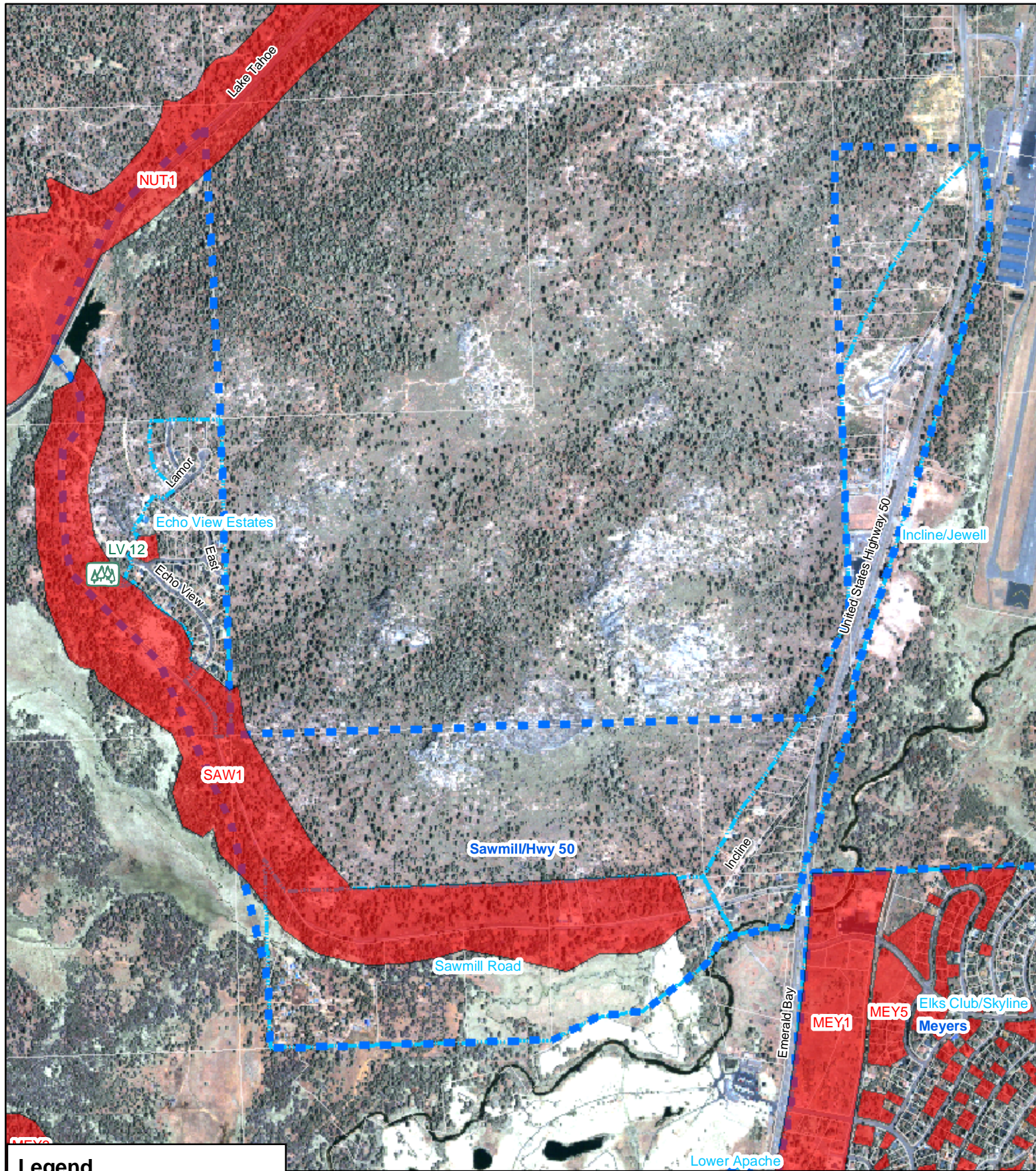
Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.





Legend

- Proposed Project
- Fire Behavior Sample Locations
- Community
- Neighborhood

Figure 12.
Proposed Projects Sawmill/Highway 50

0 0.1 0.2 0.3 0.4 0.5 Miles



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Lake Valley

Name of Community: Sawmill/Highway 50

Date: November 2004

Project Title: Sawmill/Highway 50 1-SAW1

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project area is a NFFL fuel model 2. A fire in this area would have a rate of spread of 1300 to 1700 feet per hour with flame lengths 4 to 8 feet creating and intense surface fire with a passive crown fire.*

***Tactical decision for Project:** Defense Zone was selected to protect homes in the community from a wildfire burning into the community of Echo View Estates from the southwest driven by a moderate Southwest wind. The fuels in this zone are made up of high surface fuel loading greater than 20 tons per acre and sage brush with an understory of small diameter trees.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Seventh

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

SAW1 is located along the southwestern portion of the Sawmill/Highway 50 community.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

***Stream Environment Zones Prescription:** Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.*

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

Hand Piling and Burning. All cut material and dead and down material greater than 3 inches in diameter and up to 14 inches diameter shall be piled for burning. Piles shall be constructed compactly beginning with a core of fine fuels and minimizing air spaces to facilitate complete combustion. Piles will be constructed at least 1.5 times the diameter of the pile from residual trees and no taller than five feet to prevent damage when burning. If the area will not be broadcast burned, then each pile will be lined with a wet or hand fire line. At least one half of each pile will be covered with water resistant burnable paper to cover the fine material in the center of the piles.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classification 1A. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classification and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$2,500 per acre
\$2,500 x 120 acres = \$300,000

Total = \$300,000

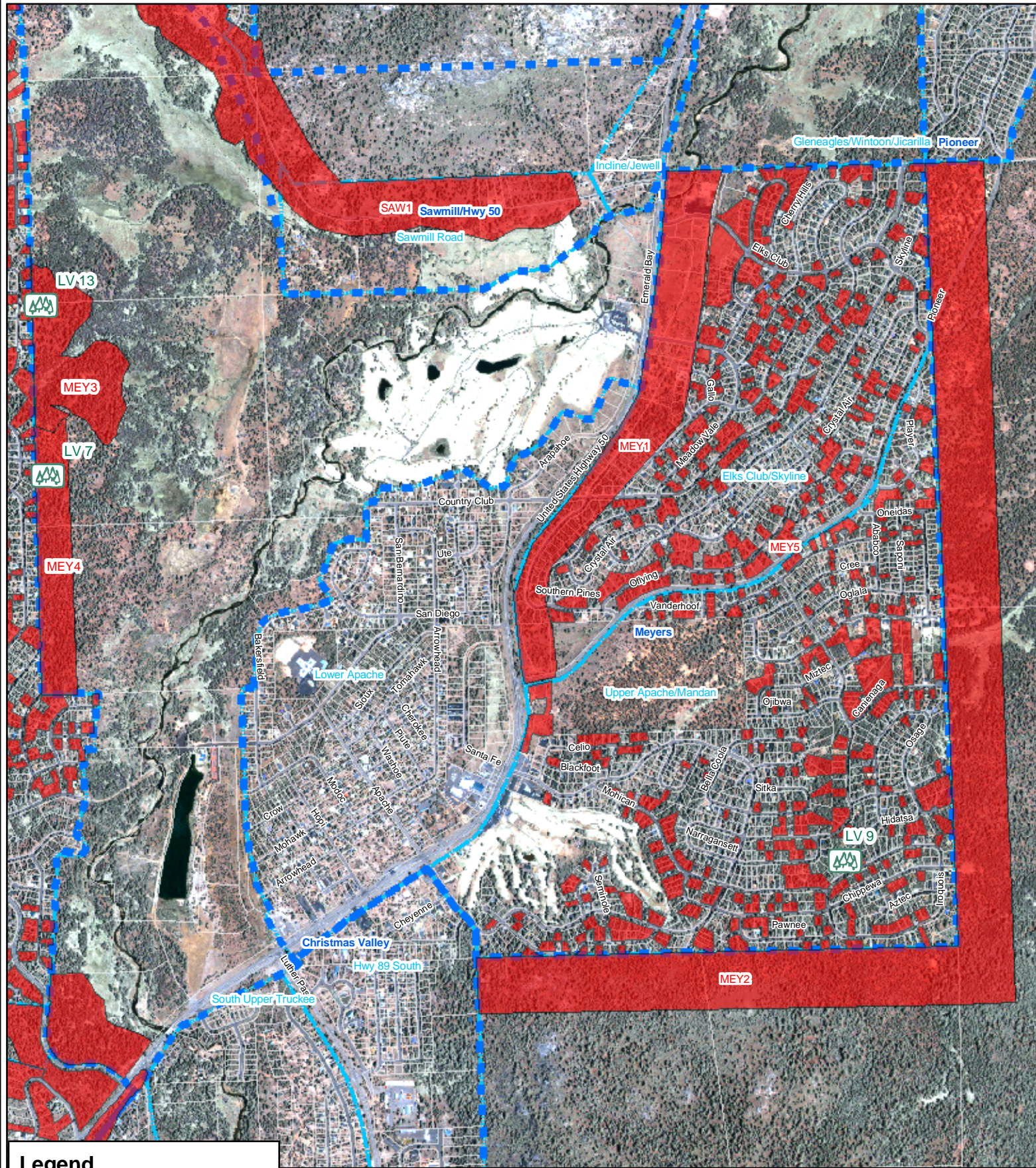
Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.





Legend

- Proposed Project
- Fire Behavior Sample Location
- Community
- Neighborhood

Figure 13.
Proposed Projects Meyers

0 0.1 0.2 0.3 0.4 0.5 Miles



Risk/Hazard Identification and Mitigation Project Worksheet

Fire District: Lake Valley

Name of Community: Meyers

Date: November 2004

Project Title: Meyers 1-MEY1

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** NFFL The project is in a NFFL Fuel model 10. A fire in this area would have a rate of spread 300 to 1600 feet per hour with flame lengths 3 to 6 feet. The type of fire would be an intense surface fire with passive crowning. Wind from any direction would move a wildfire quickly into the homes.*

***Tactical Decision for Project:** Defense Zone was selected to protect homes in the community from a wildfire burning into the community of Montgomery Estates initiating along CA State Hwy 89 to the west and southwest. The fuels in this zone are made up of high surface fuel loading greater than 20 tons per acre and sage brush with an understory of small diameter trees.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Fifth

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

MEY1 is located on the western border of the Meyers community.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

***Stream Environment Zones Prescription:** Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.*

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

Hand Piling and Burning. All cut material and dead and down material greater than 3 inches in diameter and up to 14 inches diameter shall be piled for burning. Piles shall be constructed compactly beginning with a core of fine fuels and minimizing air spaces to facilitate complete combustion. Piles will be constructed at least 1.5 times the diameter of the pile from residual trees and no taller than five feet to prevent damage when burning. If the area will not be broadcast burned, then each pile will be lined with a wet or hand fire line. At least one half of each pile will be covered with water resistant burnable paper to cover the fine material in the center of the piles.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within SEZ's. The SEZ should be ground verified to ensure they apply to the project area.

Mechanical operations are required for the cost effective completion of this project. Over the snow operations will not mitigate heavy surface fuels.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$4,600 per acre
\$4,600 x 73 acres = \$ 335,800

Total = \$ 335,800

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Lake Valley

Name of Community: Meyers

Date: November 2004

Project Title: Meyers 2–MEY2

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project is a NFFL fuel model 10, that would burn with a rate of spread of 300 to 1600 feet per hour and flame lengths of 3 to 6 feet. The type of fire would be an intense surface fire with passive crowning. The project also contains NFFL fuel model 9 that would burn with flame lengths of 2 to 4 feet and rates of spread of 400 to 1800 feet per hour, creating a moderate to intense surface fire that is difficult to control without the use of heavy equipment.*

***Tactical Decision for Project:** Defense Zone was selected to protect homes in the Meyers community from a wildfire burning into the community from Forest Service land to the south and east of Meyers. The fuels in this zone are made up of high surface fuel loading greater than 20 tons per acre and sage brush with an understory of small diameter trees. There are also areas with moderate fuel loadings where the LTBMU has thinned but a prescribed fire would reduce the fuel loading to a more acceptable level.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Sixth

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

MEY2 is located on the southern and western borders of the Meyers community.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

Stream Environment Zones Prescription: Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

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. Chips scattered throughout the project area will not exceed four inches in depth.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classifications 1A, 2 and 3. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classifications and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area.

Mechanical operations are required for the cost effective completion of this project. Over the snow operations will not mitigate heavy surface fuels.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$4,600 per acre
\$4,600 x 242 acres = \$ 1,113,200

Total = \$ 1,113,200

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Lake Valley

Name of Community: Meyers

Date: November 2004

Project Title: Meyers 3–MEY3

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project fire behavior:** NFFL The project is in a NFFL Fuel model 10. A fire in this area would have a rate of spread 300 to 1600 feet per hour with flame lengths 3 to 6 feet. The type of fire would be an intense surface fire with passive crowning. Wind from any direction would move a wildfire quickly into the homes.*

***Tactical Decision for Project:** Defense Zone was selected to protect homes in the community from a wildfire burning in to the community of North Upper Truckee or out of the community into Meadows State Park. The fuels in this zone are made up of moderate to high surface fuel loading greater than 20 tons per acre with an understory of small diameter trees.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Fifth

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

MEY3 is located west of the Meyers community and north of MEY4.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

***Stream Environment Zones Prescription:** Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.*

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

Prescribed Burning in Forests. 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 three inches dbh. Use fire to prune ladder fuels by scorching the lower 1/3 of branches on 100% of trees less than eight inches dbh. Retain large down logs (14 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:

- six foot maximum scorch height; and,
- less than 10% mortality in conifers > 12 inches dbh.

Do not ignite fires in stream environment zones (SEZs). 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 10-hour fuels (<1 inch diameter) should be consumed in SEZs.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classification 3. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classification and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area.

Mechanical operations are required for the cost effective completion of this project. Over the snow operations will not mitigate heavy surface fuels.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$2,500 per acre
\$2,500 x 34 acres = \$85,000

Total = \$85,000

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Lake Valley

Name of Community: Meyers

Date: November 2004

Project Title: Meyers 4-MEY4

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project fire behavior:** NFFL The project is in a NFFL Fuel model 10. A fire in this area would have a rate of spread 300 to 1600 feet per hour with flame lengths 3 to 6 feet. The type of fire would be an intense surface fire with passive crowning. Wind from any direction would move a wildfire quickly into the homes.*

***Tactical Decision for Project:** Defense Zone was selected to protect homes in the community from a wildfire burning in to the community of North Upper Truckee or out of the community into Washoe Meadows State Park. The fuels in this zone are made up of moderate to high surface fuel loading greater than 20 tons per acre with an understory of small diameter trees.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Fifth

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

MEY4 is located west of the Meyers community and south of MEY3.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

***Stream Environment Zones Prescription:** Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.*

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

Prescribed Burning in Forests. 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 three inches dbh. Use fire to prune ladder fuels by scorching the lower 1/3 of branches on 100% of trees less than eight inches dbh. Retain large down logs (14 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:

- six foot maximum scorch height; and,
- less than 10% mortality in conifers > 12 inches dbh.

Do not ignite fires in stream environment zones (SEZs). 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 10-hour fuels (<1 inch diameter) should be consumed in SEZs.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classification 3. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classification and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$2,500 per acre
\$2,500 x 29 acres = \$72,500

Total = \$72,500

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Lake Valley

Name of Community: Meyers

Date: November 2004

Project Title: Meyers 5-MEY5

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** NFFL The project is in a NFFL Fuel model 10. A fire in this area would have a rate of spread 300 to 1600 feet per hour with flame lengths 3 to 6 feet. The type of fire would be an intense surface fire with passive crowning. Wind from any direction would move a wildfire quickly into the homes.*

***Tactical decision for Project:** Urban Lot was selected to protect homes from a fire that initiates inside the community providing protection to neighboring homes. Also provide protection inside the community from spotting fire brands from a fire outside the community.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Sixth

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

MEY5 is located throughout the Meyers community.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

Urban Lots

Fuels treatment on urban lots are generally conducted by hand thinning and designed to remove excessive fuels, thereby altering fire behavior and reducing the ability of a wildfire to move to neighboring lots. Trees spacing and ladder fuels will be the same as in the defense zone. Urban lots will have about 40% canopy cover and will be approximately 120 sq ft basal area.

Urban lot prescriptions are accomplished through a specific combination of thinning with either pile burning or chipping as the disposal method. Implementation of the prescriptions is unique given the proximity to structures and the relatively easy access to the forest stand. Though hand thinning has been the favored treatment technique, mechanical thinning and mastication with small machines should be evaluated as an alternative cost-effective method of treating urban fuels.

***Urban Lot Prescription.** Reduce the potential for crown fires by increasing the crown base height to at least 20 feet. Starting with the smallest diameter class and remove suppressed and intermediate trees to achieve the prescribed crown base height. Remove ground fuels greater than three inches diameter and treat shrub densities to achieve flame lengths of no more than two feet.*

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within SEZ's. The SEZ should be ground verified to ensure they apply to the project area. Mechanical operations can be limited to the existing roadways and trails.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

*Defense Zone \$4,075 per acre
\$4,075 x 193 acres = \$ 786,475*

Total = \$ 786,475

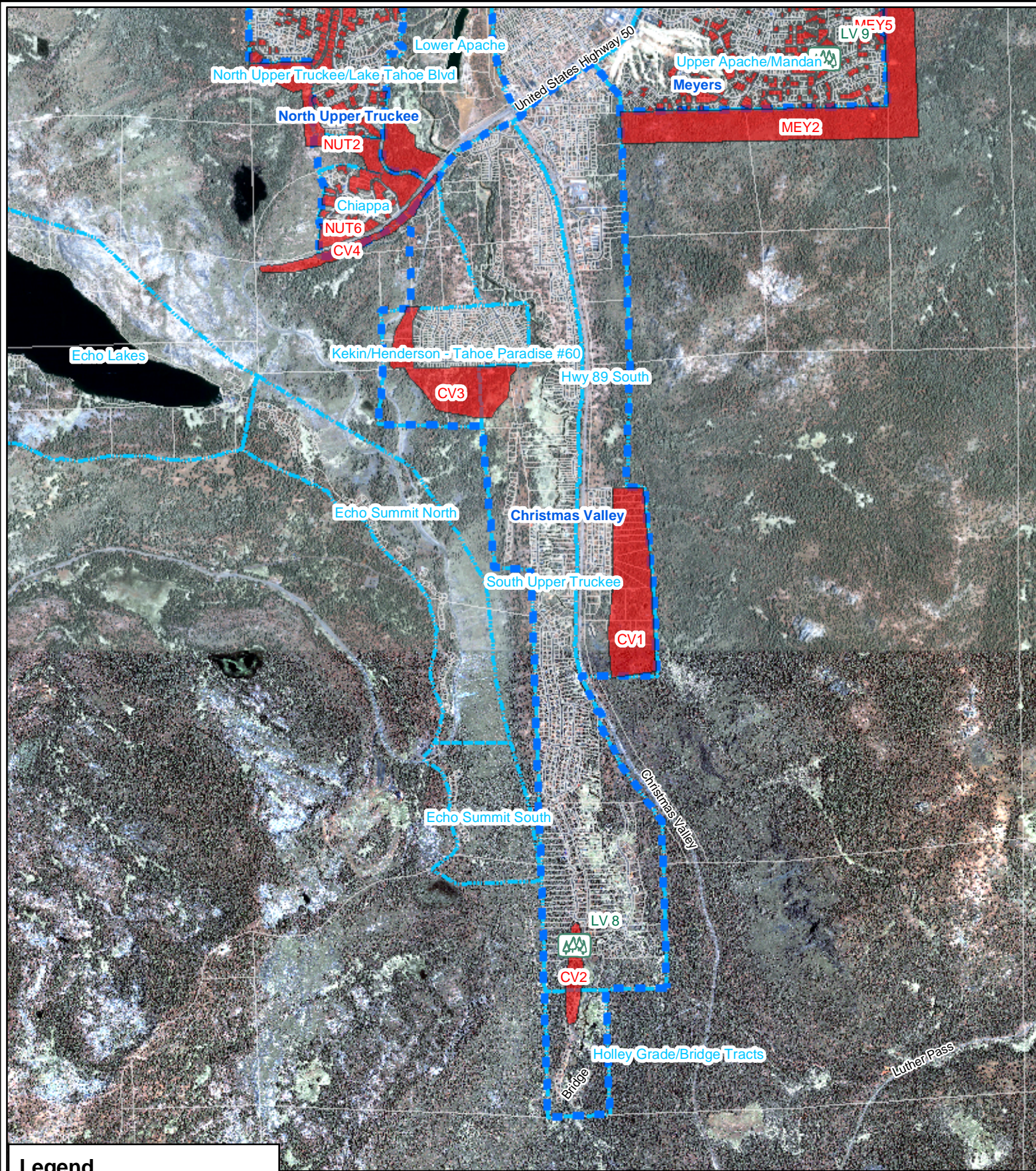
Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.

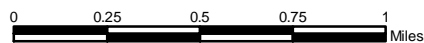




Legend

- Proposed Project
- ⚡ Fire Behavior Sample Location
- Community
- Neighborhood

Figure 14.
Proposed Projects Christmas Valley



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Lake Valley

Name of Community: Christmas Valley

Date: November 2004

Project Title: Christmas Valley 1-CV1

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** NFFL The project is in a NFFL Fuel model 10. A fire in this area would have a rate of spread 300 to 1600 feet per hour with flame lengths 3 to 6 feet. The type of fire would be an intense surface fire with passive crowning. Wind from any direction would move a wildfire quickly into the homes.*

***Tactical decision for Project:** Defense Zone was selected to protect homes in the community from a wildfire burning into the community of Christmas Valley initiating on LTBMU property above the community. The fuels in this zone are made up of moderate to high surface fuel loading greater than 20 tons per acre with an understory of small diameter trees.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Ninth

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

CV1 is located in the western portion of the Christmas Valley community.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

***Stream Environment Zones Prescription:** Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.*

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

Due to steep slopes, hand thinning will be the most likely treatment.

Hand Piling and Burning. All cut material and dead and down material greater than 3 inches in diameter and up to 14 inches diameter shall be piled for burning. Piles shall be constructed compactly beginning with a core of fine fuels and minimizing air spaces to facilitate complete combustion. Piles will be constructed at least 1.5 times the diameter of the pile from residual trees and no taller than five feet to prevent damage when burning. If the area will not be broadcast burned, then each pile will be lined with a wet or hand fire line. At least one half of each pile will be covered with water resistant burnable paper to cover the fine material in the center of the piles.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classifications 1A and 1C. The current proposed prescription of hand treatment is in agreement with the operational constraints within Bailey Landuse Classifications and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$2,500 per acre
\$2,500 x 76 acres = \$190,000

Total = \$212,500

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Lake Valley

Name of Community: Christmas Valley

Date: November 2004

Project Title: Christmas Valley 2-CV2

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project area is a NFFL fuel model 12 that would burn with a rate of spread of 600 to 1600 feet per hour with flame lengths of 6 to 9 feet. The type of fire, would be an intense surface fire with high intensity, active crowning. A southerly wind would move a wildfire quickly into the community.*

***Tactical decision for Project:** Defense Zone was selected to protect homes in the Christmas Valley from a wildfire initiating on the Forest Service property to the south and west of the community. The fuels in this zone are made up of extreme surface fuel loading greater than 90 tons per acre with a dense understory of White fir. Hazard trees were removed from the powerline corridor and never treated adding to the fuel loading.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Ninth

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

CV2 is located in the southern portion of the Christmas Valley community.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

Stream Environment Zones Prescription: Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

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. Chips scattered throughout the project area will not exceed four inches in depth.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classification 1A. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classification and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area.

Mechanical operations are required for the cost effective completion of this project. Over the snow operations will not mitigate heavy surface fuels.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$4,600 per acre
\$4,600 x 14 acres = \$ 64,400

Total = \$ 64,400

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Lake Valley

Name of Community: Christmas Valley

Date: November 2004

Project Title: Christmas Valley 3-CV3

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** NFFL The project is in a NFFL Fuel model 10. A fire in this area would have a rate of spread 300 to 1600 feet per hour with flame lengths 3 to 6 feet. The type of fire would be an intense surface fire with passive crowning. Wind from any direction would move a wildfire quickly into the homes.*

***Tactical decision for Project:** Meadow restoration to reduce lodgepole intrusion into the meadow and improve ecosystem health. This project will also change the fuel model to one that is easier to suppress a wildfire. Change Fuel model from a brush model to a grass model reducing flame lengths and resistance to control.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Ninth

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

CV3 is located in the northwestern portion of the Christmas Valley community.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

Meadow Restoration

Meadow restoration involves removing encroaching lodgepole pines. In many areas (Washoe Meadows State Park, Pope Beach, Baldwin Beach), high mortality of mature lodgepole pines has increased fuel hazards and impacted the meadow system. The purpose of this treatment would be restoring the historic fire intensity, where flame lengths are less than two feet and create a landscape-level area where fire behavior is significantly modified. Few if any mature lodgepole pines would exist in the meadows.

***Thinning:** Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.*

***Hand Piling and Burning.** All cut material and dead and down material greater than 3 inches in diameter and up to 14 inches diameter shall be piled for burning. Piles shall be constructed compactly beginning with a core of fine fuels and minimizing air spaces to facilitate complete combustion. Piles will be constructed at least 1.5 times the diameter of the pile from residual trees and no taller than five feet to prevent damage when burning. If the area will not be broadcast burned, then each pile will be lined with a wet or hand fire line. At least one half of each pile will be covered with water resistant burnable paper to cover the fine material in the center of the piles.*

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classifications 1A and 1C. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classifications and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area.

Mechanical operations are required for the cost effective completion of this project. Over the snow operations will not mitigate heavy surface fuels.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

*Defense Zone \$1,200 per acre
\$1,200 x 54 acres = \$64,800*

Total = \$64,800

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Lake Valley

Name of Community: Christmas Valley

Date: November 2004

Project Title: Christmas Valley 4-CV4

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

Pre-project Fire Behavior: *NFFL The project is in a NFFL Fuel model 10. A fire in this area would have a rate of spread 300 to 1600 feet per hour with flame lengths 3 to 6 feet. The type of fire would be an intense surface fire with passive crowning. Wind from any direction would move a wildfire quickly into the homes.*

Tactical decision for Project: *Roadside protection along US Hwy 50 will reduce high fuel loading along the roadway. Fuel loadings are high on either side of the road, making the road impassable during a fire event.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Ninth

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

CV4 is located on the northern border of the Christmas Valley community.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

Roadside Protection

Roadside protection would occur within a corridor that extends up to 100 feet out from either side of the road. This treatment is designed to protect evacuation routes for community residents and provide safety for firefighters entering a community to provide protection in the event of a wildfire. Brush and shrubs would have a spacing of 3 times the height of the residual plants and be removed immediately adjacent to the road to keep flames from directly impinging the roadway. Spacing between trees would be at least 20 feet between crowns of residual trees, with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. Trees immediately adjacent to the road would be few. Flamelengths would be less than 2 feet, with enough clearance to keep flames from traveling directly across the roadway.

Vegetation removal techniques may be by a combination of mechanical thinning, hand thinning, piling and burning, chipping, prescribed burn, and/or mastication. Mastication is the preferred method since it leaves the treated fuel material on-site. Leaving the treated material is particularly desirable on road shoulders to cover bare soil for erosion control.

Mastication. *Where mastication is recommended for projects proposed in this report, use rubber tired or low impact tracked vehicles to cut, chip, and scatter all shrubs and small trees up to 10" dbh on site. Brush cover should be reduced by creating a mosaic of treated and untreated shrubs. Brush that is treated should be cut to the maximum of six inches in height. No individual pieces of cut material shall be greater than 4 feet long. All masticated stumps shall be cut to within six inches of the ground. No debris shall average more than two inches over the entire project area. All cut vegetation will be kept within the unit boundaries. Any cut vegetation falling into ditches, roads, road banks, trails, or adjacent units shall immediately be removed.*

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classification 1A. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classification and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

*Defense Zone \$800 per acre
\$800 x 19 acres = \$15,200*

Total = \$15,200

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



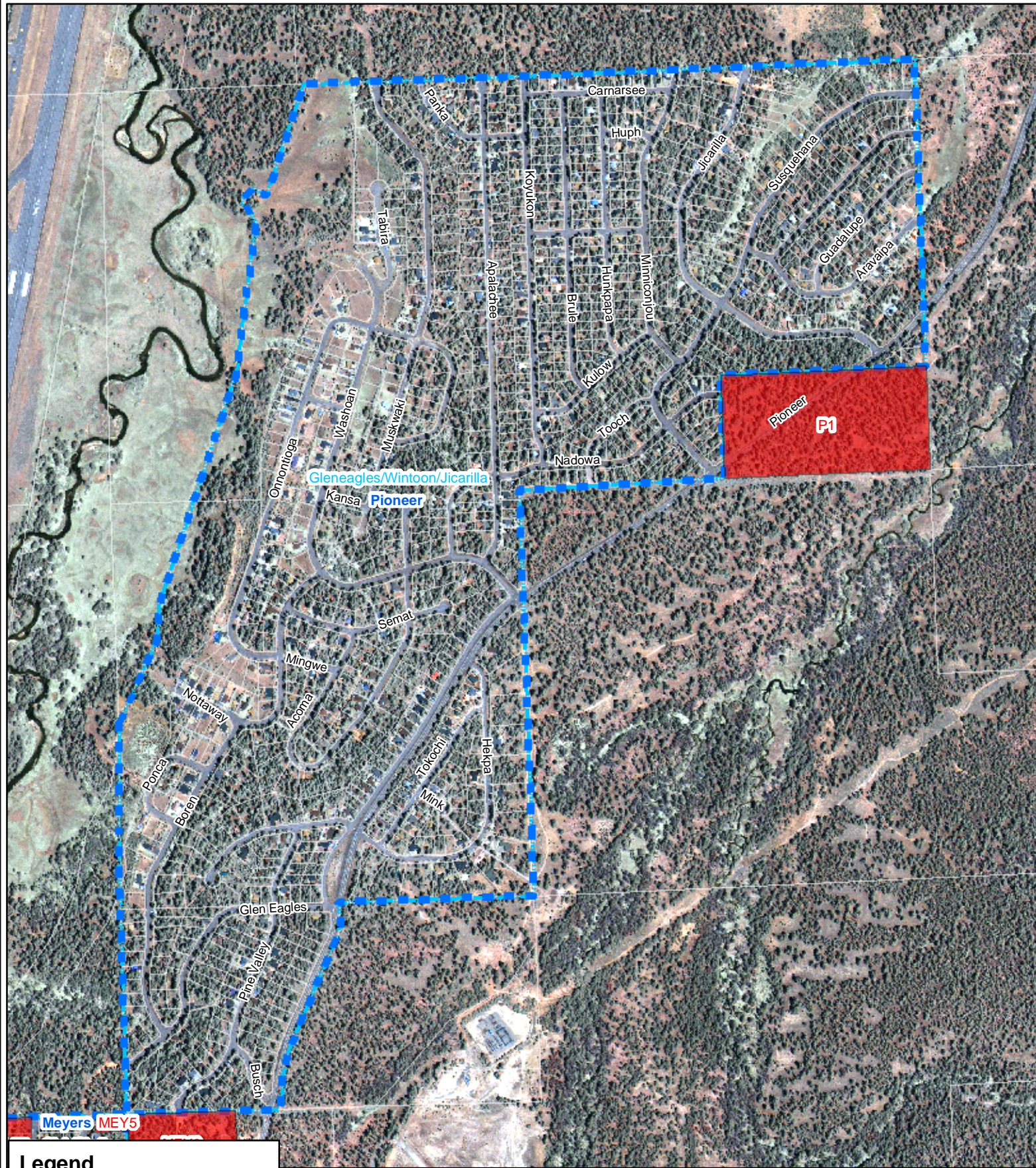


Figure 15.
Proposed Projects Pioneer

Legend

- Proposed Project
- Fire Behavior Sample Location
- Community
- Neighborhood

0 0.1 0.2 0.3 0.4 0.5 Miles



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Lake Valley

Name of Community: Pioneer

Date: November 2004

Project Title: Pioneer 1-P1

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project is in a NFFL Fuel model 10. A fire in this area would have a rate of spread 300 to 600 feet per hour with flame lengths 3 to 6 feet. The type of fire would be an intense surface fire with passive crowning.*

***Tactical decision for Project:** Defense Zone was selected to protect homes in the Pioneer community from a wildfire burning into the community from LTBMU land to the south and east of Pioneer or a fire starting along Pioneer Trail. The fuels in this zone are made up of high surface fuel loading greater than 20 tons per acre and sage brush with an understory of small diameter trees. There are also areas with moderate*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Fourth

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

P1 is in the northeastern portion of the Pioneer community.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

***Stream Environment Zones Prescription:** Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.*

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

Hand Piling and Burning. All cut material and dead and down material greater than 3 inches in diameter and up to 14 inches diameter shall be piled for burning. Piles shall be constructed compactly beginning with a core of fine fuels and minimizing air spaces to facilitate complete combustion. Piles will be constructed at least 1.5 times the diameter of the pile from residual trees and no taller than five feet to prevent damage when burning. If the area will not be broadcast burned, then each pile will be lined with a wet or hand fire line. At least one half of each pile will be covered with water resistant burnable paper to cover the fine material in the center of the piles.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within SEZ's. The SEZ should be ground verified to ensure they apply to the project area.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$2,500 per acre
\$2,500 x 20 acres = \$50,000 **Total = \$50,000**

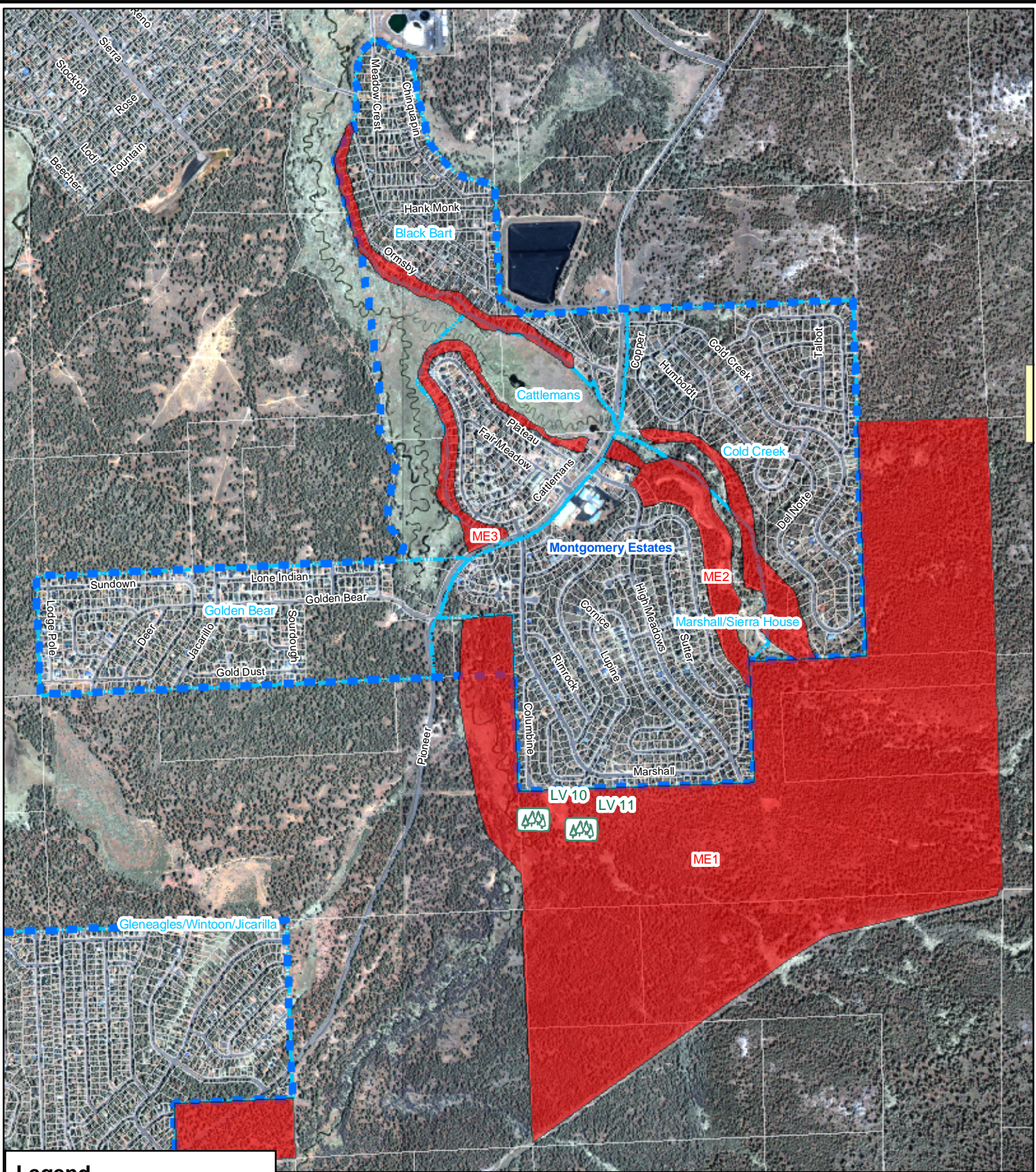
Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.





Legend

- Proposed Project
- Fire Behavior Sample Location
- Community
- Neighborhood

Figure 16.
Proposed Projects Montgomery Estates

0 0.1 0.2 0.3 0.4 0.5 Miles



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Lake Valley

Name of Community: Montgomery Estates

Date: November 2004

Project Title: Montgomery Estates 1-ME1

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project is in a NFFL fuel model 10. A fire in this area would have a rate of spread 300 to 1600 feet per hour with flame lengths 3 to 6 feet. The type of fire would be an intense surface fire with passive crowning. The project also contains NFFL fuel model 2 that would burn with a rate of spread of 1300 to 1700 feet per hour with flame lengths of 4 to 8 feet creating an intense surface fire with a passive crown fire.*

***Tactical decision for Project:** Defense Zone was selected to protect homes in the Montgomery Estates community from a wildfire burning into the community from LTBMU land to the south and east of Meyers. The fuels in this zone are made up of high surface fuel loading greater than 20 tons per acre and sage brush with an understory of small diameter trees. There are also areas with moderate fuel loadings where the LTBMU has thinned but a prescribed fire would reduce the fuel loading to a more acceptable level.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Third

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

ME1 is located southeast of the Montgomery Estates community.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

***Stream Environment Zones Prescription:** Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.*

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

Hand Piling and Burning. All cut material and dead and down material greater than 3 inches in diameter and up to 14 inches diameter shall be piled for burning. Piles shall be constructed compactly beginning with a core of fine fuels and minimizing air spaces to facilitate complete combustion. Piles will be constructed at least 1.5 times the diameter of the pile from residual trees and no taller than five feet to prevent damage when burning. If the area will not be broadcast burned, then each pile will be lined with a wet or hand fire line. At least one half of each pile will be covered with water resistant burnable paper to cover the fine material in the center of the piles.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classifications 1A, 2 and 3. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classifications and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area.

Mechanical operations are required for the cost effective completion of this project. Over the snow operations will not mitigate heavy surface fuels.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$2,500 per acre
\$2,500 x 496 acres = \$1,240,000

Total = \$1,240,000

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Lake Valley

Name of Community: Montgomery Estates

Date: November 2004

Project Title: Montgomery Estates 2-ME2

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project is in a NFFL fuel model 10 that would burn with a rate of spread of 300 to 1600 feet per hour with flame lengths of 3 to 6 feet. The type of fire would be an intense surface fire with passive crowning. The project also contains NFFL fuel model 9 with flame lengths of 2 to 4 feet and rates of spread of 400 to 1800 feet per hour, creating a moderate to intense surface fire that is difficult to control without the use of heavy equipment.*

***Tactical decision for Project:** Urban Lot was selected to protect homes in the Montgomery Estates community from a wildfire burning into the community from LTBMU land. The fuels in this zone are made up of high surface fuel loading greater than 20 tons per acre and sagebrush with an understory of small diameter trees. There are also areas with moderate fuel loadings where the LTBMU has thinned but a prescribed fire would reduce the fuel loading to a more acceptable level.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Third

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

ME2 is located in the eastern portion of the Montgomery estates community.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

Urban Lots

Fuels treatment on urban lots are generally conducted by hand thinning and designed to remove excessive fuels, thereby altering fire behavior and reducing the ability of a wildfire to move to neighboring lots. Trees spacing and ladder fuels will be the same as in the defense zone. Urban lots will have about 40% canopy cover and will be approximately 120 sq ft basal area.

Urban lot prescriptions are accomplished through a specific combination of thinning with either pile burning or chipping as the disposal method. Implementation of the prescriptions is unique given the proximity to structures and the relatively easy access to the forest stand. Though hand thinning has been the favored treatment technique, mechanical thinning and mastication with small machines should be evaluated as an alternative cost-effective method of treating urban fuels.

***Urban Lot Prescription.** Reduce the potential for crown fires by increasing the crown base height to at least 20 feet. Starting with the smallest diameter class and remove suppressed and intermediate trees to achieve the prescribed crown base height. Remove ground fuels greater than three inches diameter and treat shrub densities to achieve flame lengths of no more than two feet.*

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classifications 1A, 2 and 3. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classifications and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area. Mechanical operations can be limited to the existing roads and trails within the community.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

*Defense Zone \$4,075 per acre
\$4,075 x 41 acres = \$ 167,075*

Total = \$ 167,075

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet

Fire District: Lake Valley

Name of Community: Montgomery Estates

Date: November 2004

Project Title: Montgomery Estates 3-ME3

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project is in a NFFL fuel model 10 that would burn with a rate of spread of 300 to 1600 feet per hour with flame lengths of 3 to 6 feet. The type of fire would be an intense surface fire with passive crowning. The project also contains NFFL fuel model 9 with flame lengths of 2 to 4 feet and rates of spread of 400 to 1800 feet per hour, creating a moderate to intense surface fire that is difficult to control without the use of heavy equipment.*

***Tactical Decision for Project:** Urban Lot was selected to protect homes in the Montgomery Estates community from a wildfire burning into the community from LTBMU land. The fuels in this zone are made up of high surface fuel loading greater than 20 tons per acre and sagebrush with an understory of small diameter trees. There are also areas with moderate fuel loadings where the LTBMU has thinned but prescribed fire would reduce the fuel loading to a more acceptable level.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Third

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

ME3 is located in the northwest portion of the Montgomery Estates community.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

Urban Lots

Fuels treatment on urban lots are generally conducted by hand thinning and designed to remove excessive fuels, thereby altering fire behavior and reducing the ability of a wildfire to move to neighboring lots. Trees spacing and ladder fuels will be the same as in the defense zone. Urban lots will have about 40% canopy cover and will be approximately 120 sq ft basal area.

Urban lot prescriptions are accomplished through a specific combination of thinning with either pile burning or chipping as the disposal method. Implementation of the prescriptions is unique given the proximity to structures and the relatively easy access to the forest stand. Though hand thinning has been the favored treatment technique, mechanical thinning and mastication with small machines should be evaluated as an alternative cost-effective method of treating urban fuels.

***Urban Lot Prescription.** Reduce the potential for crown fires by increasing the crown base height to at least 20 feet. Starting with the smallest diameter class and remove suppressed and intermediate trees to achieve the prescribed crown base height. Remove ground fuels greater than three inches diameter and treat shrub densities to achieve flame lengths of no more than two feet.*

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within SEZ's. The SEZ should be ground verified to ensure they apply to the project area. Mechanical operations would be limited to existing roads and trails within the community.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

*Defense Zone \$4,075 per acre
\$4,075 x 29 acres = \$ 118,175*

Total = \$ 118,175

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



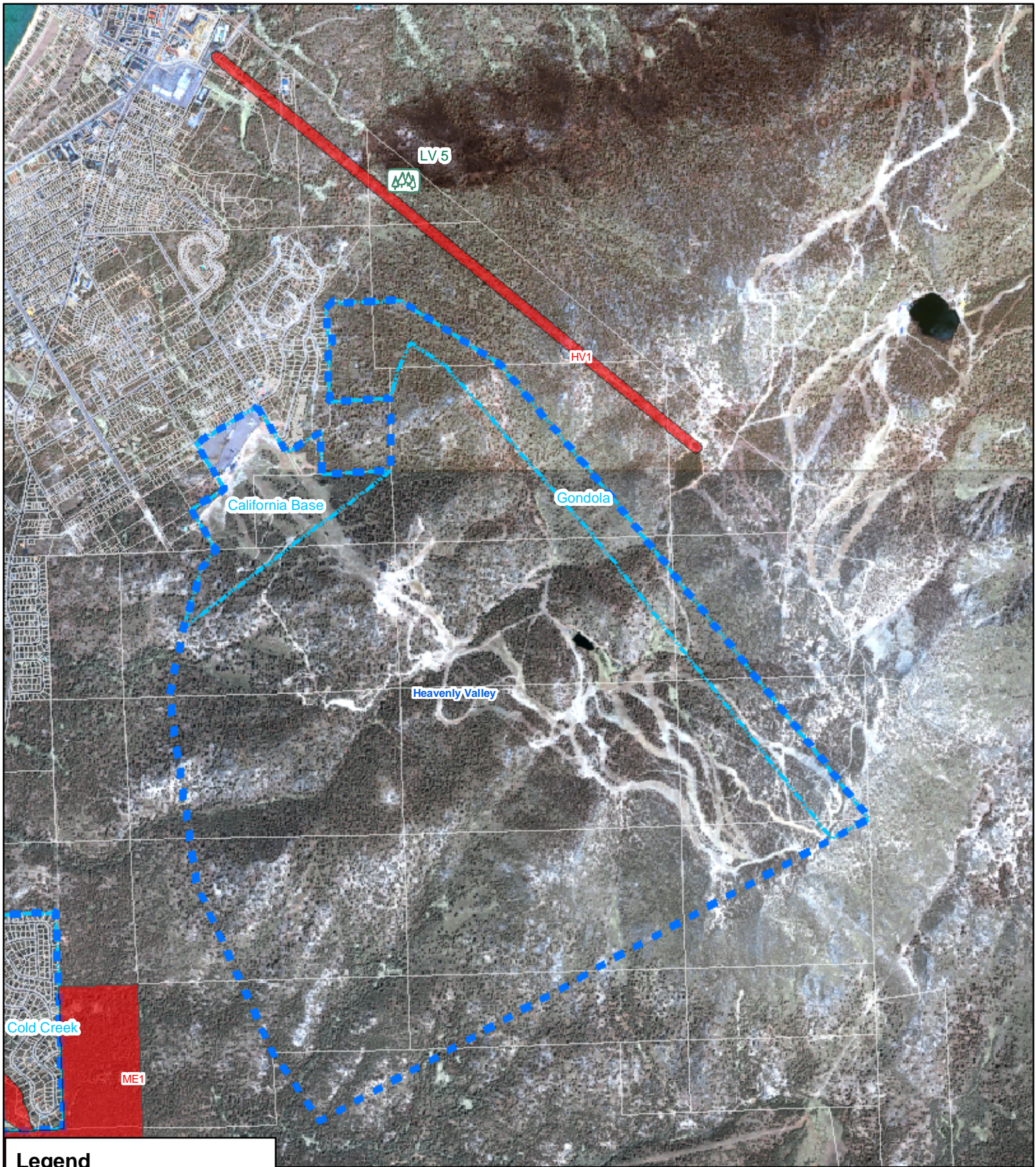






Figure 17.
Proposed Projects Heavenly Valley

Legend

-  Proposed Project
-  Fire Behavior Sample Location
-  Community
-  Neighborhood

0 0.25 0.5 0.75 1 Miles



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Lake Valley

Name of Community: Heavenly Valley

Date: November 2004

Project Title: Heavenly Valley 1-HV1

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project area is a NFFL fuel model 10 that would burn with a rate of spread of 500 to 1700 feet per hour. The type of fire would be similar to the Gondola fire, passive and active crowning with intense surface fire caused by the fuel loading in excess of 30 tons per acre*

***Tactical Decision for Project:** Defense Zone was selected to prevent any future Gondola fires from spreading out of South Lake Tahoe and into the communities to the east. The project would also clean up the accumulation of fuels under the Heavenly Gondola. Current fuel loadings present a significant safety risk to the cable due to stress heating during a fire event.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Ninth

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

HV1 is located north of the Heavenly Valley community.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

***Stream Environment Zones Prescription:** Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.*

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

Hand Piling and Burning. All cut material and dead and down material greater than 3 inches in diameter and up to 14 inches diameter shall be piled for burning. Piles shall be constructed compactly beginning with a core of fine fuels and minimizing air spaces to facilitate complete combustion. Piles will be constructed at least 1.5 times the diameter of the pile from residual trees and no taller than five feet to prevent damage when burning. If the area will not be broadcast burned, then each pile will be lined with a wet or hand fire line. At least one half of each pile will be covered with water resistant burnable paper to cover the fine material in the center of the piles.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classifications 1A, 1C and 2. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classifications and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area.

Mechanical operations are required for the cost effective completion of this project. Over the snow operations will not mitigate heavy surface fuels.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$4,600 per acre
\$4,600 x 53 acres = \$ 243,800

Total = \$ 243,800

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Lake Valley

Name of Community: Lake Valley

Date: November 2004

Project Title: Community Defensible Space Program

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** Numerous private lots within the LVFPD contain hazardous wildland fuels. These fuels pose a hazard to structures located on the lots or adjacent lots. Significant structure loss will result from the proximity of wildland fuels during a wildfire event.*

***Tactical decision for Project:** The LVFPD would like to provide landowners assistance in establishing effective defensible space around structures.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

All private land lots less than 2 acres within the Lake Valley Fire Protection District

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

Urban Lots

Fuels treatment on urban lots are generally conducted by hand thinning and designed to remove excessive fuels, thereby altering fire behavior and reducing the ability of a wildfire to move to neighboring lots. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. Urban lots will have about 40% canopy cover and will be approximately 110 to 150 sq ft basal area. On steep slopes, tree spacing may be increased. The Living with Fire in the Tahoe Basin guidelines should be used in creating effective defensible space.

Urban lot prescriptions are accomplished through a specific combination of thinning with either pile burning or chipping as the disposal method. Implementation of the prescriptions is unique given the proximity to structures and the relatively easy access to the forest stand. Though hand thinning has been the favored treatment technique, mechanical thinning and mastication with small machines should be evaluated as an alternative cost-effective method of treating urban fuels.

***Urban Lot Prescription.** Reduce the potential for crown fires by increasing the crown base height to at least 20 feet. Starting with the smallest diameter class and remove suppressed and intermediate trees to achieve the prescribed crown base height and tree spacing. Remove ground fuels greater than three inches diameter and treat shrub densities to achieve flame lengths of no more than two feet. Dispose of biomass material through chipping.*

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a Bailey Land Classifications 1A. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classifications. The Bailey Land Class should be ground verified to ensure they apply to the project area.

Mechanical equipment can be limited to the roadway, with hand crews pulling material to the edge of the road for disposal.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Community Defensible Space \$2,500 per acre
\$2,500 x 1675 acres = \$4,188,000 **Total = \$4,188,000**

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated by hand or with mechanical means every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.

3. MEEKS BAY FIRE PROTECTION DISTRICT

3.1 Demographics, location, topography, and climatic data

The Meeks Bay Fire Protection District (MBFPD) is located in the southwestern portion of the Lake Tahoe Basin (Figure 18). The north boundary of the District is the El Dorado County / Placer County border and the south boundary is the northern edge of Bliss State Park. The west line projects around the subdivisions adjacent to the highway. The District serves the communities of Tahoma, Meeks Bay, and Rubicon. A summary of land management in the District's service area is provided in Table 20.

Table 20: Land Management Acreage within the Meeks Bay Fire Protection District

Land Administrator	ACRES
State of California	841
LTBMU	1244
Private/Municipal	1504
Total	3585

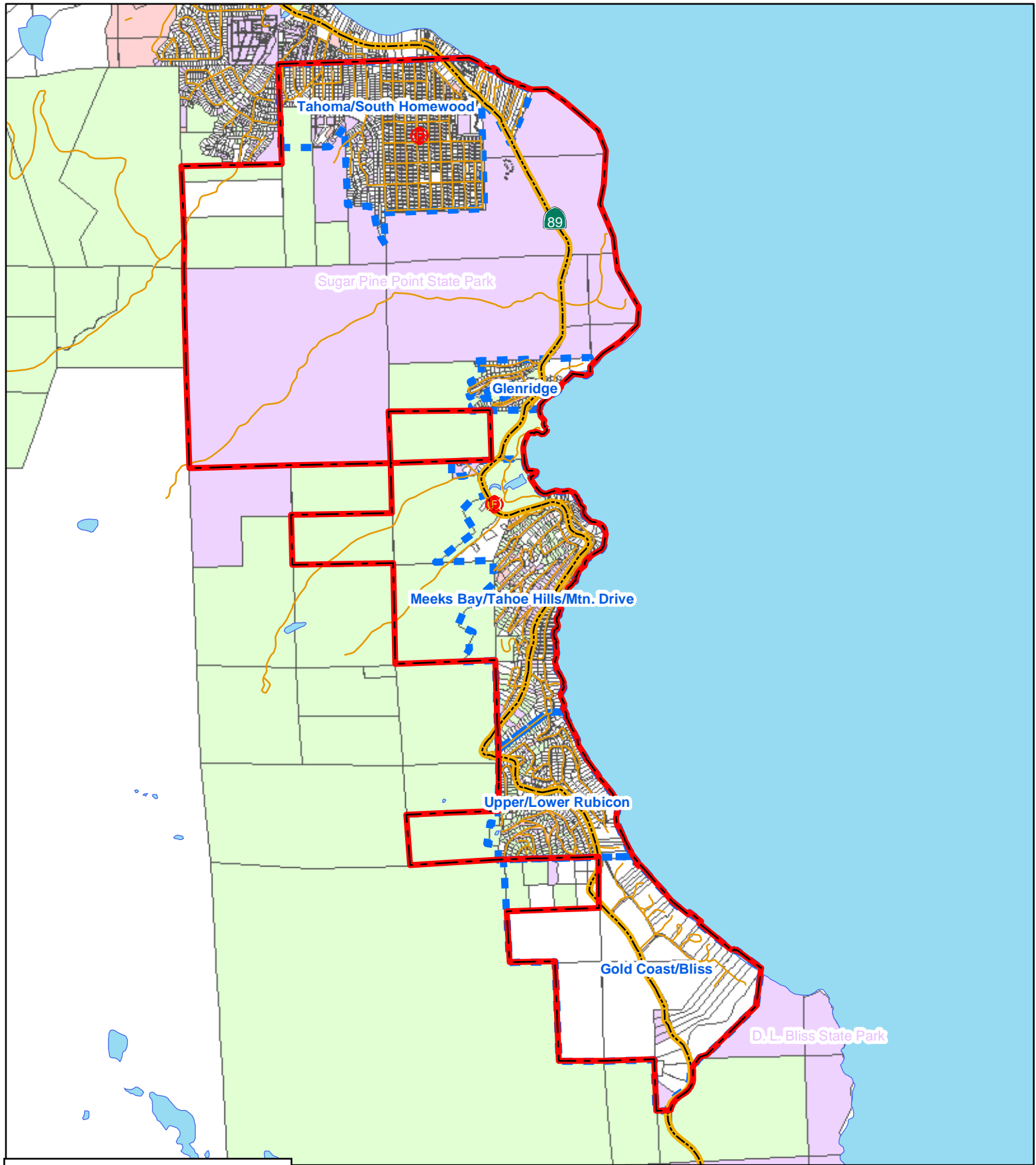
The area has a permanent population of around 1,000 residents. During peak summer periods, the population can swell to as many as 10,000. The economy in the area is based on tourism, and Emerald Bay area is one of the most frequently visited areas in the basin, as well as the State. There is very little retail, and virtually no manufacturing business in the area. Along with tourism, construction, real estate, and home businesses comprise the majority of the economic base. During the winter, the area south of the Meeks Bay is very sparsely populated, with maybe 10% of the residencies being occupied.

Elevations range from Lake level (6230') to roughly 7200' at Upper Rubicon. There are numerous drainages and gullies, along with several areas of steep cliffs. Many of the homes on the hills are oriented in a south to southeast aspect. Due to the orientation and steep topography, the homes in the Rubicon and Tahoe Hills area are especially susceptible to a fire that could easily accelerate beyond the threshold of control.

3.2 Fire District Overview

Wildfire Protection Resources

The responsibility for wildland firefighting suppression in the District and on the State lands lies with the California Department of Forestry (CDF). Due to a "balance of efforts" agreement, the USFS has assumed this responsibility on the California side of the Lake Tahoe Basin in return for CDF covering federal lands located elsewhere in the State. Unfortunately, unlike CDF, the USFS does not provide around the clock coverage. As a result, after USFS crews go off shift (usually around 5-6 pm) the District is the



primary responder to wildland fires. Via mutual agreements, the MBFPD will also work side by side with the USFS on wildland incidents that are adjacent to the communities.

Through mutual aid agreements and contracts, the MBFPD also responds to emergency calls at the State and Federal parks and lands surrounding the District. These parks include close to 800 campsites, as well as administrative and maintenance buildings and infrastructure. The SAR partnership program with the County Sheriff's Department can entail rescues in the backcountry surrounding the District. Automatic aid agreements extend from Homewood on the north, to Eagle Falls in Emerald Bay at the South. Finally, via cooperative mutual aid agreements, when available, we respond to emergencies throughout California and Northern Nevada. While the MBFPD is not the primary agency responsible for responding to wildfires in rural communities described in this plan, we do indeed respond on the initial alarm, unless the fire is located deep in the wilderness, miles from communities.

Wildland Suppression resources rapidly available to the MBFPD include the following agencies:

- North Tahoe Fire Protection District
- The City of South Lake Tahoe Fire Department
- Lake Valley Fire Protection District
- Fallen Leaf Fire Protection District
- Squaw Valley Fire Department
- North Lake Tahoe Fire Protection District
- Tahoe Douglas Fire Protection District
- Truckee Fire Protection District
- Northstar Fire Department
- USFS Lake Tahoe Basin Management Unit
- CDF
- Lake Tahoe Regional Fire Chiefs Association Mutual Aid Agreement
- California Master Mutual Aid Agreement
- California State Parks

The MBFPD is a "combination" fire district that employs five full-time career firefighters, a full-time administrative office manager (who also helps with prevention paperwork), two seasonal firefighters, three part-time firefighters and 14 volunteer firefighters. Due to fluctuations in the number of available volunteers and housing difficulties, our volunteer roster can change dramatically from season to season and from year to year. Five elected directors govern the MBFPD and they generally meet once a month.

The District covers roughly 14 square miles with two stations and eight vehicles (four engines and four utility vehicles). All four of the engines have basic compliment of wildfire suppression equipment. Two rigs are set up specifically for wildland fires. Wildfire resources at any given time are supplied from 2 stations in the MBFPD. Apparatus available from these two stations for a wildland fire include:

-
- 3 Type 1 Engines (1 outfitted for wildland fires and 1 carries 2000 gallons of water)
 - 1 Type 3 Engine (dedicated to wildland incidents)
 - 2 Utility Vehicles
 - 1 Command Vehicle

The District has cooperative agreements with numerous wildland agencies and is also an associate member of the Sierra Front Wildfire Cooperators agency. The MBFPD also works closely with the USFS station located just north of the main station in Meeks Bay. Through dispatch, the MBFPD can immediately source numerous engines, crews, air resources, and a Type 2 overhead team. If needed, the MBFPD also has access to multiple strike teams from both California and Northern Nevada. Driving time will obviously be a factor in the response times for these resources, and unfortunately, the MBFPD probably could not muster enough equipment to have an engine for every house in the event of a catastrophe. In the event of a huge conflagration, by the time the long-distance resources arrive, a raging fire will likely burn through the community and up to the ridges. Once a fire gets to this size, it is likely that federal Type 1 overhead team would come in to manage the situation.

Water Sources and Infrastructure

Lake Tahoe is the largest water source, and is part of the suppression plan for many of the houses along the shoreline. The MBFPD is capable of drawing water from the Lake via engine drafting, a large portable pump, and a floating pump. There are also six different water systems within the immediate sphere of influence for the District. Some are quite old (over 50 years) and some are relatively new. With the exception of the Tahoma and a small portion of the Glenridge communities, hydrants are within 500 hundred feet of 99% of the structures in the MBFPD.

The MBFPD has a new 2000-gallon water tender that is equipped with a portable tank. The first out engine carries 1000 gallons of water. Through mutual aid, the MBFPD has three additional water tenders within a 30-minute response of our area. The MBFPD works with the water system operators to ensure a reliable source from the hydrants. Most of the systems have a backup generator to power pump stations, however implementation during an incident is sometimes slow and untimely.

Some of the water mains in the Tahoma community are small and are prone to low pressures. Some of the lakefronts just north and south of General Creek Campground / Ehrman Mansion have no hydrants and are quite a distance from the Lake. With the exception of an older private water system in a portion of the Upper Rubicon area (serving 4 houses) the balance of the District south of Meeks Bay is served by a fairly reliable and modern system of hydrants. The lakeside area just north of Meeks Bay, including Drum Road and the Meeks Bay Resort, does not have an adequate water system. The Glenridge community does have a decent system of hydrants, however there is no permanently mounted back-up generator for their pump.

Unfortunately, whether it is due to too much demand, mechanical problems, or electrical outages, the MBFPD can experience a situation whereby a community “runs out” of water at least once a year. The District is in constant communication with the water companies in an effort to ensure that this valuable resource will be there when it is needed. Finally, as discussed above, the MBFPD has developed alternative methods of dealing with a water shortage by acquiring equipment that either carry more water or can be used to pump water from the Lake, or other sources.

The ISO rating for the communities in the MBFPD is a 5.

Fire Protection Personnel Qualifications

All of the MBFPD full and part time safety personnel have graduated from an approved fire academy, which includes training in both structural and wildland firefighting. All full-time staff members have a minimum of California Fire Marshal certification “Firefighter 1.” The District also follows the guidelines set forth in the “California Incident Command Certification System” (CICCS), which cross-qualifies to match State classes with the “National Wildfire Coordinating Group” series of certifications and courses. All staff train in wildland firefighting annually, and many drills are devoted to fighting fires in the “interface” scenario.

MBFPD Emergency Dispatch and Communications

Excluding the occasional direct call to the station, all non-cellular 911 phone emergencies are routed first to the Placerville emergency dispatch center. Fire and medical aid calls are then transferred to Placer County Dispatch (PCSO) in Tahoe City, who then dispatch Meeks Bay firefighters via radios and pagers. Emergencies called in via cell phone are usually routed to the CHP in Sacramento in California. These agencies will then contact PCSO, who in turn pages out the appropriate resources. PCSO has a Computer Aided Dispatch (CAD) that is capable of building multiple alarms and accessing resources from throughout the state as well as Northern Nevada. The District has decided to contract with PCSO for dispatch since we are often responding with North Tahoe resources. PCSO has a better understanding of this area and the automatic-aid resources than the dispatch center in South Lake Tahoe.

For wildland incidents, the District communicates with the Camino Interagency Dispatch center in Camino, California. Unfortunately, this center has suffered some “growing pains” and is not as responsive, or timely as we would like. The District keeps Placer Dispatch “in the loop” in order to keep them apprised when we’re fighting a wildfire and not working on their frequency.

The MBFPD also communicates with the El Dorado County Sheriff’s office, Department of Transportation, US Coast Guard, other law agencies, the USFS, and the California State Parks. For mutual aid incidents involving the Districts to our South, the MBFPD communicates with “Central Dispatch” in South Lake Tahoe.

While it would be nice to say that the MBFPD can talk with all of these agencies on one radio, the modern technology that would allow this is too pricey and requires additional

personnel. The District has worked towards closing this gap by procuring different radios in order to communicate with the State Parks.

Call Volume

In 2003, the MBFPD responded to a total of 189 calls, of which 30 were either actual fires or fire alarms. The District also responded to 5 out-of- the-area fires as part of strike teams.

Financial Support

The MBFPD receives our tax revenues from a variety of sources including:

- ad valorem taxes (MBFPD receives .09% of every dollar in property taxes in the district)
- a voter approved benefit assessment
- a voter approved special tax
- a year-by- year annual augmentation from the County

The District also receives additional financial support from donations, grants, cost recovery measures and fees, internal interest and investments. Last but not least, the District receives a great deal of support from the Meeks Bay Volunteer Firefighters Association and the Meeks Bay Fire Ladies Auxiliary. Over the last couple of years, this additional support has amounted to over \$350,000 for the community.

3.3 Community Preparedness

A large part of the mission of the MBFPD is to provide the community with progressive fire prevention program. The MBFPD has a number of informal pre-plans, as well as some formal plans. MBFPD also adheres to County Disaster Plans (including Hazardous Materials, etc) and regional and state mutual aid plans. Evacuation plans are coordinated with the law enforcement and transportation agencies. There is also a plan to notify homeowners of emergencies via a “Teleminder” program. Through the years, the MBFPD has educated our property owners about evacuation routes and “sheltering in place” through newsletters and at public speaking engagements.

The District prides itself on its prevention program. The MBFPD works with groups or individuals in an effort to help create a safer community. The MBFPD installs smoke alarms, develops personal evacuation routes, counsels on defensible space needs, and gives advice on fire resistant building construction. They also “plan check” every new building or remodel that occurs in the District and feel that “pre-fire engineering” is important. The MBFPD cooperates with the County Building Department in an effort to build a safer community.

The MBFPD has offered a chipping service to assist property owners with the accumulated biomass resulting from fuels reduction projects. Working with the local Fire Safe Council, the MBFPD has provided fuel reduction assistance for seniors and disabled citizens that meet the qualifications. The MBFPD is actively pursuing options for the biomass, including co-generation facilities, composting and erosion control projects, and

other innovative methods to use or recycle the large amounts of forest products that are the result of the fuels reduction projects.

Residents in the Emerald Bay Tract have compiled an evacuation plan for their neighborhood. The plan describes the sections of the community, evacuation operations, staging areas, and a detailed list of homeowners with contact information. The plan also outlines in detail how an evacuation would proceed in the event of a wildfire and the agencies or officers in charge of various aspects of the evacuation. This plan could serve as a model for other neighborhoods and critical neighborhood elements should be incorporated into MBFPD preplanning documents.

El Dorado County has adopted building ordinances requiring non-flammable roofing materials be used on new construction. Wood shake roofs, even treated with retardant are not allowed.

3.4 Hazard Assessment

The Meeks Bay Fire Protection district is divided into five communities to assess the structural ignitability and hazards within the district. The communities are:

- Glenridge
- Gold Coast
- Meeks Bay
- Rubicon
- Tahoma

The Emerald Bay USFS tracts are not part of the MBFPD and are entirely on LTBMU land. No detailed assessment was conducted for this neighborhood. The seasonal residents however are concerned about wildfire and have developed an evacuation plan.

MBFPD fire protection district personnel conducted an assessment of building materials and defensible space within the communities. The results of this survey are provided in Table 21.

Table 21: Structural ignitability factors for the Communities served by the MBFPD.

Percentage of Lots and Homes			
Community	Without Defensible Space	With Flammable Unenclosed Structures	Structural Rating
Gold Coast/Bliss	100%	75%	High
Meeks Bay/ Tahoe Hills/ Mtn. Drive	74%	94%	High
Tahoma/South Homewood	47%	88%	Moderate
Upper/Lower Rubicon	80%	88%	High

The results indicate that many structures have appropriate roofing materials, but a significant number of structures lack non-flammable siding materials. Decks and

overhanging unenclosed structures, where embers could be trapped and ignite a home, are also prevalent. Any of these building materials and construction issues could result in the loss of a home during a fire event. For a structure defense to be effective, all building materials must be non-flammable and openings that trap embers must be closed.

Structures in the Emerald Bay tract were not included in this assessment, however information about the ignitability is available in the neighborhood evacuation plan. Like most seasonal cabins on USFS, almost all structures have wood siding. Most have wood shake roofs as well. Unenclosed decks are also prevalent. According to the plan, many residents are also stacking firewood close to the residents during summer months. Piles and stacks of firewood provide excellent places for burning embers to land, igniting the stack and the subsequent structure. Stacks and pile of firewood should be kept away from the structure or protected from ignition and spreading to the home.

Defensible space is generally inadequate around structures with 58% of the structures lacking defensible space.

Fire Behavior Analysis

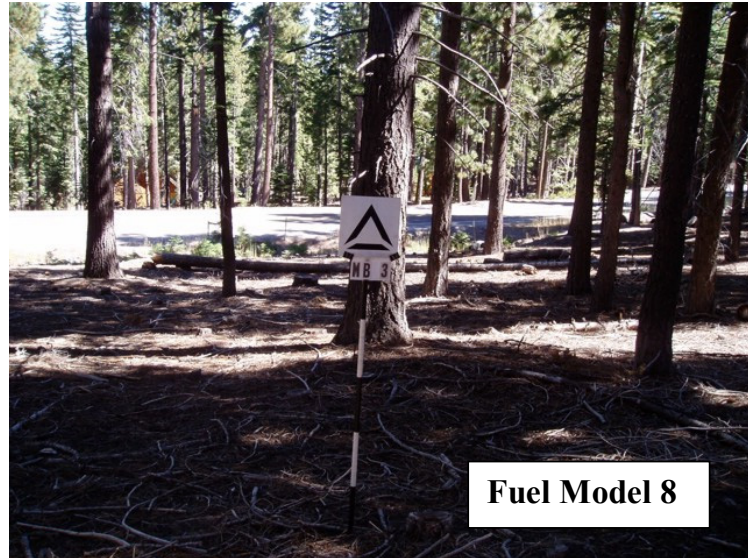
Thirteen forest sampling plots were recorded in the Meeks Bay communities to use in fire behavior modeling. Photographic examples of the different fuel models found in the MBFP follow the results in Table 22.

Table 22: Fire Behavior Analysis

Community	Plot Number	Fuel Model	Canopy Base Height	Basal Area	Flame length (feet)	Rate of Spread (feet per hour)	Fire Type
Glenridge	MB5	10	7	110	4.7	488	Passive Crown
Gold Coast	MB 1 - 2	10	5	201	6.4	660	Passive Crown
	MB 10 -11	10	7	169	5	554	Passive Crown
	MB 13	10	1	197	2.9	238	Passive Crown
Meeks Bay	MB 9	5	9	7.85	3.8	917	High Intensity Surface Fire
	MB 12	10	7	137	4.7	488	Passive Crown
Rubicon	MB 3	8	25	108	0.9	86	Surface Fire

	MB 4	10	7	110	4.7	488	Passive Crown
Tahoma	MB 6	10	1	58	3.4	343	Passive Crown
	MB 7 - 8	10	10	99	6	634	Passive Crown

All but one of the plots have fuel loadings, fire behavior characteristics, and forest stand structures that exceed the objectives established earlier in this document. The plot that meets those objectives, MB3, is a sample plot located on a LTBMU treated lot within the Rubicon community. It demonstrates the fire behavior and forest health conditions when the mitigation objectives are met (see photo to right).



The fire behavior analysis demonstrates the different challenges the Meeks Bay communities face with current fuel conditions. Note in communities with fuel model 10 (see photo) that as rate of spread increases, so does flame length. Given that flame lengths of 3 feet are difficult to control under the best of circumstances, fire behavior in most of these plots will be uncontrollable with the immediate suppression resources available in the district.

MB9 demonstrates a different challenge. Fuel model 5 (see photo) is a brush fuel model, so flame lengths are smaller than they are in timber fuel models. But the rate of spread is significantly higher. Lower flame lengths allow easier control of the fire, but the rate of spread, at 15 feet per minute, is too fast for initial attack suppression resources to contain.



Either situation poses a dangerous threat to the community; an uncontrolled wildfire.

In addition to the elements addressed in the structural ignitibility section, fire district personnel evaluated the Meeks Bay communities on a number of other criteria including slope, aspect, community design, and fire suppression infrastructure. Combined with the results of the structural assessment, each community was given a community rating.

The results of these assessment measures are in Table 23.

Table 23: Assessment Measures

Community	Structural Assessment	Fire Behavior Rating	Community Assessment
Gold Coast/Bliss	High	Extreme	Extreme
Glenridge	High	High	High
Meeks Bay/ Tahoe Hills/ Mtn. Drive	High	High	High
Tahoma/South Homewood	Moderate	Extreme	High
Upper/Lower Rubicon	High	Extreme	Extreme

3.5 Mitigation Measures

Residents and Landowners

Residents and private landowners are the most effective group in mitigating wildfire hazards. Defensible space, building materials, and home construction guidelines are designed to reduce the risk of structure loss during a wildfire to less than 1%, according to *Living with Fire in the Tahoe Basin* publication. If completed implemented, almost all structures within a community will survive a wildfire even if no community mitigation projects have been implemented. Landowners must take an active role in addressing these hazards on their property.

The results of the structural assessment conclude that most homes need to improve some component of defensible space, building materials, or home construction. California

Public Resources Code 4291 (PRC 4291) requires homeowners to address wildland fire hazards through creation of defensible space and other building construction mitigation measures. Specifically, the code requires homeowners to:

- Maintain adequate defensible space 30 feet around structures (this will increase to 100 feet January 1, 2005)
- Remove that portion of any tree which extends within 10 feet of the outlet of any chimney or stovepipe.
- Maintain any tree adjacent to or overhanging any building free of dead or dying wood.
- Maintain the roof of any structure free of leaves, needles, or other dead vegetative growth.
- Provide and maintain at all times a screen over the outlet of every chimney or stovepipe that is attached to any fireplace, stove, or other device that burns any solid or liquid fuel. The screen shall be constructed of nonflammable material with openings of not more than one-half inch in size.

Use of appropriate building materials is another important mitigation measure homeowners can address. Homeowners are required, through El Dorado County Building Code, to install non-flammable roofs when constructing their homes. Wood shake shingles, even treated, are not allowed. While this code does not apply to existing homes, the fire safe message is clear; use nonflammable building materials. Even is not required by law, homeowners should use non-flammable materials on the outside of their homes. Homeowners with wood shake roofs should have their roofs replaced with non-flammable material. Insurance companies are increasing premiums or in some cases refusing to renew policies for homes with flammable roofing material.

To address these issues, residents must educate themselves on the *Living with Fire in the Tahoe Basin* guidelines and review their property for needed improvements (Smith 2004). If residents have questions regarding the information, they should contact their local fire district to review their property and provide guidance.

The *Living with Fire in the Tahoe Basin* guidelines provide significant detail regarding the spacing and removal of trees and shrubs from around the homes (Smith 2004). Recommended spacing is commonly a minimum, residents may wish to remove more vegetation where regulations allow. On vacant lots and in the defense zone on their properties residents and landowners should provide at least 10 feet of spacing between trees, greater distances on slopes over 20%. When choosing which trees and shrubs to remove on their property, preference should be given to those individuals that are smaller and suppressed. Removal of this vegetation is less likely to require permits than larger trees and leaves the more desirable trees.

Maintaining defensible space is a continuous process. Each year residents and landowners should re-evaluate their property to ensure proper defensible space criteria are met.

Community Defensible Space Program

To assist local landowners with disposal of the biomass material generated by creating defensible space, the MBFPD and Tahoe Basin Fire Safe Council must continue the community defensible space program. Demand for the program is positive and most programs rely on grant funding to operate. Additional grant funding should be secured to continue this program.

Assuming a 100% participation rate of properties under 2 acres, the cost estimate for the community chipper program in MBFPD is \$1,088,000

Fuels Reduction Projects

To address the community hazards a number of mitigation projects were developed. Fuels reduction projects are designed to address the fuel hazards within and around the communities. Where possible, projects address not only the fuel hazard objectives, but forest and stream environment zone health objectives. The projects are described in detail in the following section.

Developing project priorities is a critical element of the community wildfire protection plan. Priorities were developed using a combination of the available datasets as criteria, including the urban values at risk (Murphy and Knopp 2000), community hazard ratings, fire behavior ratings, project type, and completed treatments in the area. The consultant team rated each of the projects according to the above elements. The fire chief made final adjustments to the ratings based on district specific knowledge.

Prioritizing the top projects in a district is fairly clear. Fire professionals across all agencies typically agree on the areas in most dire need of treatment in each district. Prioritizing the projects in the middle can be difficult. A variety of factors can be considered in the prioritization, many canceling the effects of others. Using the five criteria outlined above provided a sound method for project prioritization.

In addition to the projects outlined in this plan, the project work proposed by the LTBMU is also identified. LTBMU staff provided GIS datasets mapping the areas they expect to treat within the next 10 years around communities. These project areas were not included in mitigation projects proposed in this plan and are instead called out separately. Specific prescriptions and treatments have not been identified for these areas, so a uniform cost factor of \$2,500 per acre was used to calculate the total cost for LTBMU projects within the WUI.

Table 24: Summary of Projects, Meeks Bay Fire Protection District

Priority	Project Name	Project Type	Project Acres	Total Project Cost
1	GCB4	Roadside Protection	26	20,800
2	GCB1	Defense Zone	136	625,600
3	TSH1	Defense Zone	149	372,500

3	ULR1	Urban Lot	5	20,375
3	ULR2	Defense Zone	35	161,000
4	GCB2	Defense Zone	28	128,800
5	GCB3	Meadow Restoration	25	30,000
5	MB1	Meadow Restoration	50	60,000
6	GR1	Defense Zone	31	77,500
6	MB2	Urban Lot	19	77,425
6	MB3	Urban Lot	12	48,900
Total Cost for Meeks Bay Fire Protection District				\$1,622,900

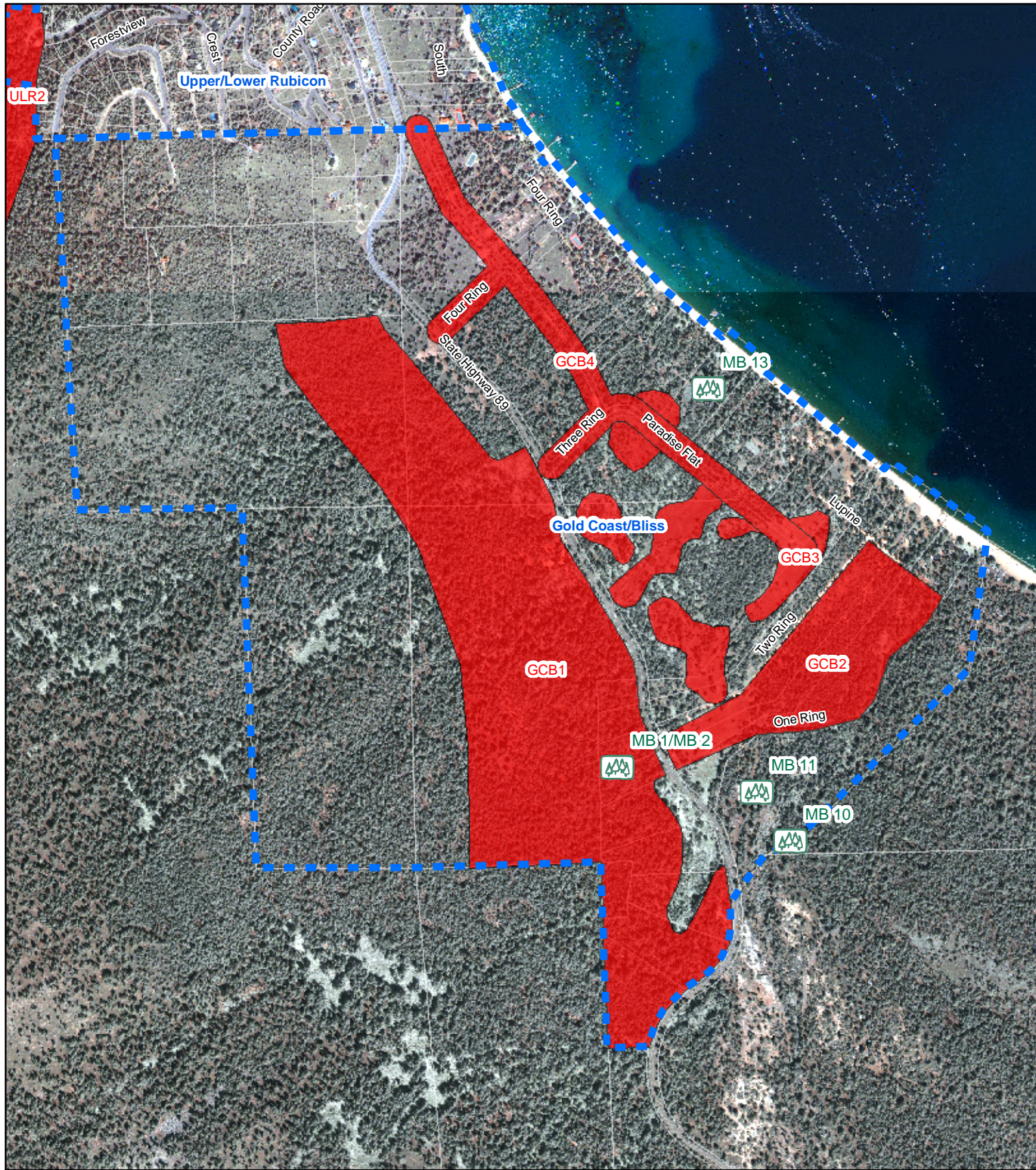
		Community Defensible Space Program		1,088,000
Total Cost for Community Defensible Space Program				\$1,088,000
		Project Proposed by LTBMU in the WUI		1,022,000
Total Cost for Project Proposed by LTBMU				\$1,022,000

Summary of all Project Costs \$3,732,900

The allocation of proposed projects by community and major landowner is summarized below in Table 25.

Table 25: Summary of Proposed Hazard Mitigation Projects across Ownership

Fire District	Landowner						Total Acres
	LTBMU by Fire District	Future LTBMU	California State Parks	California Tahoe Conservancy	Local Agency	Private	
Meeks Bay	89	700	179	41	13	685	1,707



Legend

- Proposed Project
- Fire Behavior Sample Location
- Community

Figure 19.
Proposed Projects Gold Coast/Bliss



0 0.1 0.2 0.3 0.4 0.5 Miles

Risk/Hazard Identification and Mitigation Project Worksheet

Fire District: Meeks Bay

Name of Community: Gold Coast/Bliss

Date: November 2004

Project Title: Gold Coast/Bliss 1-GCB1

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

Pre-project Fire Behavior: Wildfire fuels surrounding the community are extremely dense. Fuels are NFFL Fuel model 10 with a Rate of Spread up to 1670 feet per hour and flame lengths 6 to 20 feet. A wildfire in this project area would be a high intensity surface fire due to heavy fuel loading on the surface and dense ladder fuels. The crown fire would be passive but could change to an active crown fire. Slopes are moderate with an eastern aspect.

Tactical Decision for Project: A Defense Zone was selected to provide an area for suppression of a wildfire ignited along CA State Hwy 89. An uncontrolled fire would threaten the community and could rapidly spread through the watershed. The fuels in this zone are made up of high surface fuel loading of 43 tons per acre with a very dense understory of trees. A surface fire would ladder into a crown fire.

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Second

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

GCB1 is located in the southwestern portion of the Gold Coast/ Bliss community.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

Forest Stand Prescription: Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.

Forest health would be improved by reducing tree stocking to approximately 100 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

Brush Prescription: Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.

Stream Environment Zones Prescription: Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Slopes and access on existing roadways within the community allow for the use of mechanical equipment. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

Hand Piling and Burning. All cut material and dead and down material greater than 3 inches in diameter and up to 14 inches diameter shall be piled for burning. Piles shall be constructed compactly beginning with a core of fine fuels and minimizing air spaces to facilitate complete combustion. Piles will be constructed at least 1.5 times the diameter of the pile from residual trees and no taller than five feet to prevent damage when burning. If the area will not be broadcast burned, then each pile will be lined with a wet or hand fire line. At least one half of each pile will be covered with water resistant burnable paper to cover the fine material in the center of the piles.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classifications 1A and 2. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classifications and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area.

Mechanical operations are required for the cost effective completion of this project. Over the snow operations will not mitigate heavy surface fuels.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$4,600 per acre
\$4,600 x 136 acres = \$625,600

Total = \$625,600

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Meeks Bay

Name of Community: Gold Coast/Bliss

Date: November 2004

Project Title: Gold Coast/Bliss 2-GCB2

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** NFFL Fuel model 10 Rate of Spread could reach 634 feet per hour, flame lengths 6 to 10 feet. The fire would be a high intensity surface fire due to heavy fuel loading on the surface and dense ladder fuels. Passive crown fires that, under dry conditions, could propagate to an active crown fire independent of the surface fire.*

***Tactical Decision for Project:** Defense Zone was selected to protect homes in the community from a wildfire initiating in a campground on Bliss State Park and burning into the community. The fuels in this zone are made up of high surface fuel loading of 50 tons per acre with a very dense understory of trees less than 7 inches in diameter.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Fourth

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

GCB2 is located in the southeastern portion of the Gold Coast/Bliss community.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 100 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

***Stream Environment Zones Prescription:** Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.*

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

Hand Piling and Burning. All cut material and dead and down material greater than 3 inches in diameter and up to 14 inches diameter shall be piled for burning. Piles shall be constructed compactly beginning with a core of fine fuels and minimizing air spaces to facilitate complete combustion. Piles will be constructed at least 1.5 times the diameter of the pile from residual trees and no taller than five feet to prevent damage when burning. If the area will not be broadcast burned, then each pile will be lined with a wet or hand fire line. At least one half of each pile will be covered with water resistant burnable paper to cover the fine material in the center of the piles.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within SEZ's. The SEZ should be ground verified to ensure they apply to the project area.

Mechanical Operations are required for the cost effective completion of this project. Over the snow operations will not mitigate heavy surface fuels.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$4,600 per acre
\$4,600 x 28 acres = \$128,800

Total = \$128,800

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Meeks Bay

Name of Community: Gold Coast/Bliss

Date: November 2004

Project Title: Gold Coast/Bliss 3-GCB3

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project fire behavior:** The small lodgepole will burn like a Fuel model 6 with high rates of spread making control difficult under windy conditions. Rates of spread of will be 1400 feet per hour and flame lengths could be 5 to 8 feet creating a passive crown fire in the mature lodgepole.*

***Tactical Decision for Project:** Meadow restoration was selected to reduce lodgepole intrusion into the meadow, reducing fire behavior and improving the health of the meadow. This project will also change the fuel model from a timber model to a grass fuel model that is easier to suppress. This will require removal of trees as large as 12 inch DBH and smaller to restore grass as the fuel type.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Fifth

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

GCB3 is located in the central southeastern portion of the Gold Coast/Bliss community.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

Meadow Restoration

Meadow restoration involves removing encroaching lodgepole pines. In many areas (Washoe Meadows State Park, Pope Beach, Baldwin Beach), high mortality of mature lodgepole pines has increased fuel hazards and impacted the meadow system. The purpose of this treatment would be restoring the historic fire intensity, where flame lengths are less than two feet and create a landscape-level area where fire behavior is significantly modified. Few if any mature lodgepole pines would exist in the meadows.

***Prescribed Burning in Meadows.** Broadcast burning will occur after all grasses have cured and soils are dried. The burns will be hand ignited and sufficiently hot enough to kill 90% of all standing lodgepole pine. It may be necessary to conduct additional burns in the future to remove unconsumed lodgepole pines and those that have regenerated. In some cases, mechanical or hand thinning may be necessary to remove trees from the edge of the meadow to create a control line for the prescribed burn.*

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ. The current proposed prescription of prescribed burning and hand thinning does not conflict with the operational constraints within SEZ's.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Meadow Restoration \$1,200 per acre

\$1,200 x 25 acres = \$30,000

Total = \$30,000

Project Maintenance Requirements:

Re-burn the meadow using prescribed fire approximately every three to five years to maintain the meadow and grass fuel model.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Meeks Bay

Name of Community: Gold Coast/Bliss

Date: November 2004

Project Title: Gold Coast/Bliss 4-GCB4

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project fire behavior:** The project area is currently an NFFL fuel model 10 with a rate of spread of 330 feet per hour and flame lengths 3 to 6 feet. The type of fire would be a high intensity surface fire due to heavy fuel loading on the surface. Dense ladder fuels would create a passive crown fire.*

***Tactical Decision for Project:** The Roadside protection project was selected to improve ingress and egress during a fire event. The road is very narrow with heavy fuel loading along each side. A fire starting in the area would close the only evacuation route and limit access to the structures for suppression equipment. The project will require the removal of 12 inch DBH and smaller trees and the surface fuels.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

First

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

GCB4 is located in the northeastern portion of the Gold Coast/Bliss community

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

Roadside Protection

Roadside protection would occur within a corridor that extends up to 100 feet out from either side of the road. This treatment is designed to protect evacuation routes for community residents and provide safety for firefighters entering a community to provide protection in the event of a wildfire. Brush and shrubs would have a spacing of 3 times the height of the residual plants and be removed immediately adjacent to the road to keep flames from directly impinging the roadway. Spacing between trees would be at least 20 feet between crowns of residual trees, with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. Trees immediately adjacent to the road would be few. Flamelengths would be less than 2 feet, with enough clearance to keep flames from traveling directly across the roadway.

Vegetation removal techniques may be by a combination of mechanical thinning, hand thinning, piling and burning, chipping, prescribed burn, and/or mastication. Mastication is the preferred method since it leaves the treated fuel material on-site. Leaving the treated material is particularly desirable on road shoulders to cover bare soil for erosion control.

***Thinning:** Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for roadside protection. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.*

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. Chips scattered throughout the project area will not exceed four inches in depth.*

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within SEZ's. The SEZ should be ground verified to ensure they apply to the project area.

If the mechanical equipment is limited to the roadway, portions of the project could be accomplished within the operational constraint. To achieve the entire prescription, mechanical equipment would have to leave the roadway.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

*Roadway Clearance \$800 per acre
\$800 x 26 acres = \$20,800*

Total = \$20,800

Project Maintenance Requirements:

The area immediately adjacent to the roadway should be treated annually by mowing or mastication. Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.





Legend

- Proposed Project
- Fire Behavior Sample Location
- Community

Figure 20.
Proposed Projects Glenridge

0 0.05 0.1 0.15 0.2 0.25 Miles



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Meeks Bay

Name of Community: Glenridge

Date: November 2004

Project Title: Glenridge1-GR1

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project is in a NFFL fuel model 10 with a rate of spread of 300 feet per hour and flame lengths of 4 to 6 feet. The type of fire would be a high intensity surface fire due to heavy fuel loading on the ground.*

***Tactical decision for Project:** The Defense Zone was selected to protect the community of Glenridge from a fire initiating in Sugar Pine State Park and entering the community. The combination of slope and north winds could push a fire directly into the community.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Sixth

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

GR1 is located north of the Glenridge community.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 100 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

***Thinning:** Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.*

Prescribed Burning in Forests. 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 three inches dbh. Use fire to prune ladder fuels by scorching the lower 1/3 of branches on 100% of trees less than eight inches dbh. Retain large down logs (14 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:

- six foot maximum scorch height; and,
- less than 10% mortality in conifers > 12 inches dbh.

Do not ignite fires in stream environment zones (SEZs). 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 10-hour fuels (<1 inch diameter) should be consumed in SEZs.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a Bailey Land Classifications 1A. The current proposed prescription of mechanical treatment in conflict with the operational constraints within Bailey Landuse Classifications. The Bailey Land Class should be ground verified to ensure they apply to the project area.

Hand thinning methods could be used if mechanical thinning is not allowed.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$2,500 per acre
\$2,500 x 31 acres = \$77,500

Total = \$77,500

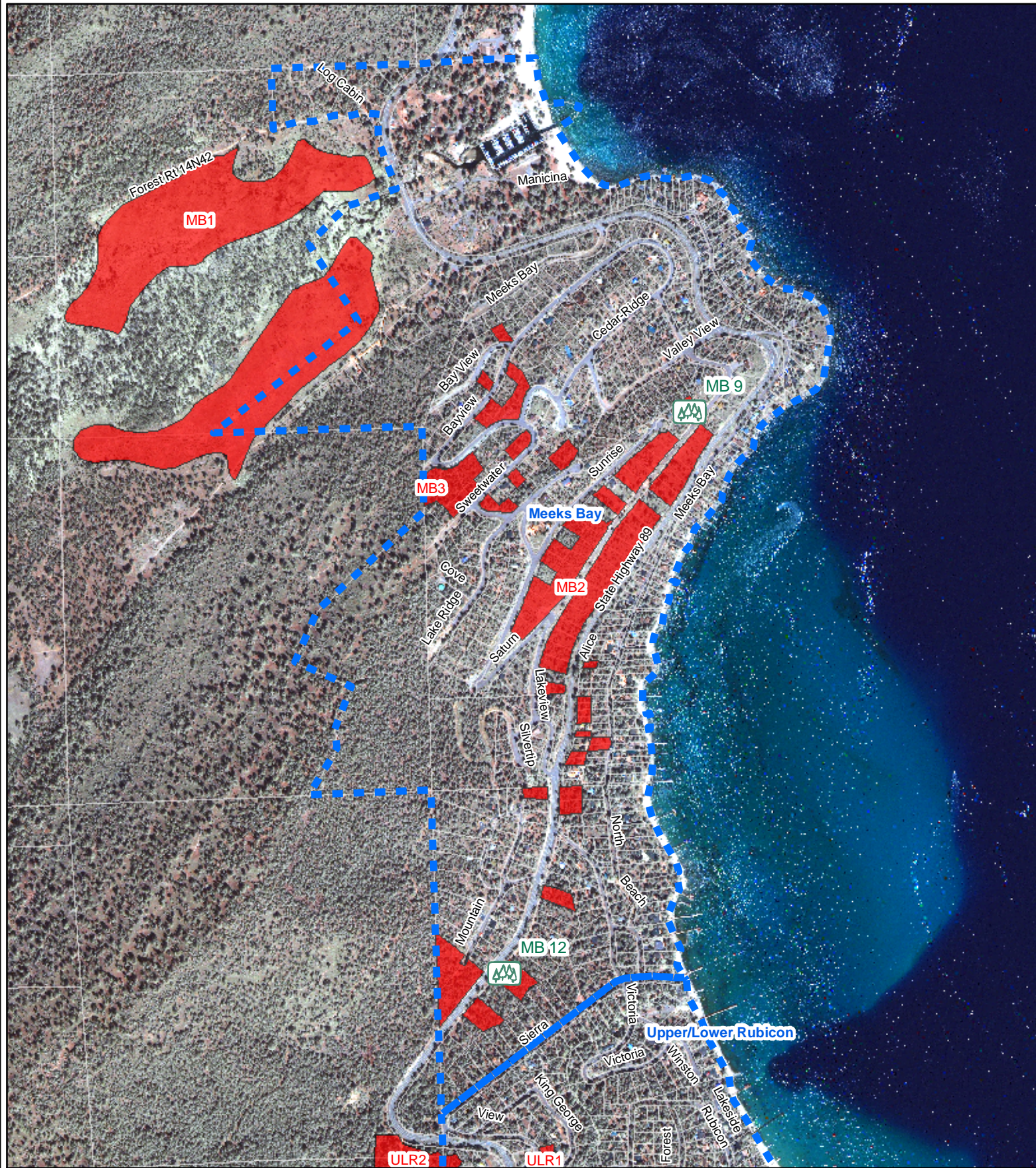
Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.





Legend

- Proposed Project
- ▲▲▲ Fire Behavior Sample Location
- Community

Figure 21
Proposed Projects Meeks Bay

0 0.1 0.2 0.3 0.4 0.5 Miles



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Meeks Bay

Name of Community: Meeks Bay

Date: November 2004

Project Title: Meeks Bay 1-MB1

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The small lodgepole pines will burn like a fuel model 6 with high rates of spread, making control difficult under windy conditions. Rates of spread would be 1400 feet per hour with flame lengths of 5 to 8 feet.*

***Tactical decision for Project:** Meadow restoration was selected to reduce lodgepole intrusion into the meadow, reducing fire behavior and improving the health of the meadow. This project will also change the fuel model from a timber model to a grass fuel model that is easier to suppress. This will require removal of trees as large as 12 inch DBH and smaller to restore grass as the fuel type.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Fifth

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

MB1 is located west of the northern portion of the Meeks Bay community.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

Meadow Restoration

Meadow restoration involves removing encroaching lodgepole pines. In many areas (Washoe Meadows State Park, Pope Beach, Baldwin Beach), high mortality of mature lodgepole pines has increased fuel hazards and impacted the meadow system. The purpose of this treatment would be restoring the historic fire intensity, where flame lengths are less than two feet and create a landscape-level area where fire behavior is significantly modified. Few if any mature lodgepole pines would exist in the meadows.

***Prescribed Burning in Meadows.** Broadcast burning will occur after all grasses have cured and soils are dried. The burns will be hand ignited and sufficiently hot enough to kill 90% of all standing lodgepole pine. It may be necessary to conduct additional burns in the future to remove unconsumed lodgepole pines and those that have regenerated. In some cases, mechanical or hand thinning may be necessary to remove trees from the edge of the meadow to create a control line for the prescribed burn.*

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classifications 1A. The current proposed prescription of prescribed fire does not conflict with the operational constraints within Bailey Landuse Classifications and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

*Meadow Restoration \$1,200 per acre
\$1,200 x 50 acres = \$60,000*

Total = \$60,000

Project Maintenance Requirements:

Re-burn the meadow using prescribed fire approximately every three to five years to maintain the meadow and grass fuel model.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Meeks Bay

Name of Community: Meeks Bay

Date: November 2004

Project Title: Meeks Bay 2-MB2

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project area contains NFFL brush fuel model 5. In the steep terrain and southerly winds, a fire with a rate of spread of 840 feet per hour and flame lengths of 4 feet a fire would be difficult to suppress*

***Tactical decision for Project:** The Urban Lot prescription was selected to create a fuels treatment within the community to protect the homes above CA State Hwy 89. Ignitions from the roadway would allow fire to move directly and swiftly into the neighborhood.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Sixth

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

MB2 is located in the central eastern portion of the Meeks Bay community.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

Urban Lots

Fuels treatment on urban lots are generally conducted by hand thinning and designed to remove excessive fuels, thereby altering fire behavior and reducing the ability of a wildfire to move to neighboring lots. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. Urban lots will have about 40% canopy cover and will be approximately 110 to 150 sq ft basal area.

Urban lot prescriptions are accomplished through a specific combination of thinning with either pile burning or chipping as the disposal method. Implementation of the prescriptions is unique given the proximity to structures and the relatively easy access to the forest stand. Though hand thinning has been the favored treatment technique, mechanical thinning and mastication with small machines should be evaluated as an alternative cost-effective method of treating urban fuels.

***Urban Lot Prescription.** Reduce the potential for crown fires by increasing the crown base height to at least 20 feet. Starting with the smallest diameter class and remove suppressed and intermediate trees to achieve the prescribed crown base height and tree spacing. Remove ground fuels greater than three inches diameter and treat shrub densities to achieve flame lengths of no more than two feet.*

Mastication would also be appropriate for use within this project area since the fuel type is brush. Mastication equipment would likely be able to treat the majority of the area from the roadway. Steep slope mastication equipment (machines that could operate on 40% slopes) could be employed here. This project represents a good opportunity to develop an "innovative technique" for mechanized treatment of fuels on steep slopes that would normally be precluded under current regulatory constraints.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a Bailey Land Classifications 1A. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classifications. The Bailey Land Class should be ground verified to ensure they apply to the project area.

Mechanical equipment can be limited to the roadway, with hand crews pulling material to the edge of the road for disposal.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

*Urban Lot \$4,075 per acre
\$4,075 x 19 acres = \$77,425*

Total = \$77,425

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated by hand or with mechanical means every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Meeks Bay

Name of Community: Meeks Bay

Date: November 2004

Project Title: Meeks Bay 3-MB3

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project area is NFFL fuel model 10. A fire in this area would be of high intensity with a rate of spread of 300 feet per hour and flame lengths of 4 to 6 feet. Ladder fuels pose the potential for a crown fire.*

***Tactical decision for Project:** Urban Lot was selected to protect homes from a fire that initiates on LTBMU land with a southwest wind that pushes the fire into the community. Also, the project would provide protection inside the community from spotting fire brands.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Sixth

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

MB3 is located in the southwestern and northwestern portions of the Meeks Bay community.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

Urban Lots

Fuels treatment on urban lots are generally conducted by hand thinning and designed to remove excessive fuels, thereby altering fire behavior and reducing the ability of a wildfire to move to neighboring lots. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. Urban lots will have about 40% canopy cover and will be approximately 110 to 150 sq ft basal area.

Urban lot prescriptions are accomplished through a specific combination of thinning with either pile burning or chipping as the disposal method. Implementation of the prescriptions is unique given the proximity to structures and the relatively easy access to the forest stand. Though hand thinning has been the favored treatment technique, mechanical thinning and mastication with small machines should be evaluated as an alternative cost-effective method of treating urban fuels.

***Urban Lot Prescription.** Reduce the potential for crown fires by increasing the crown base height to at least 20 feet. Starting with the smallest diameter class and remove suppressed and intermediate trees to achieve the prescribed crown base height. Remove ground fuels greater than three inches diameter and treat shrub densities to achieve flame lengths of no more than two feet.*

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a Bailey Land Classifications 1A. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classifications. The Bailey Land Class should be ground verified to ensure they apply to the project area.

Mechanical equipment can be limited to the roadway, with hand crews pulling material to the edge of the road for disposal.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

*Urban Lots \$4,075 per acre
\$4,075 x 12 acres = \$48,900*

Total = \$48,900

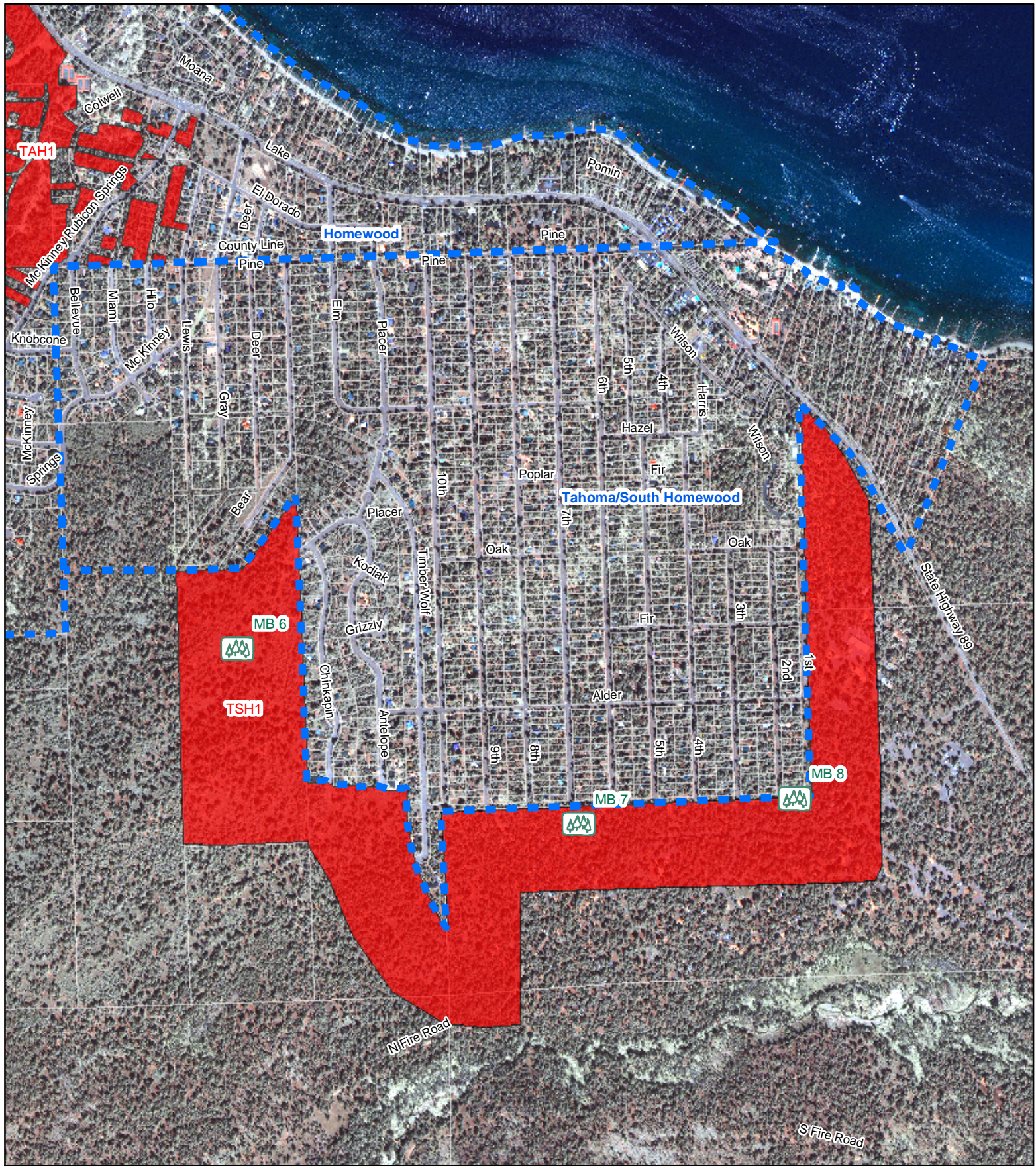
Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated by hand or with mechanical means every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.





Legend

- Proposed Project
- ▲▲▲ Fire Behavior Sample Location
- Community

Figure 22.
Proposed Projects Tahoma/South Homewood



0 0.1 0.2 0.3 0.4 0.5 Miles

Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Meeks Bay

Name of Community: Tahoma/ South Homewood

Date: November 2004

Project Title: Tahoma/South Homewood 1-TSH1

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project area is NFFL fuel model 10. A fire in this area would be of high intensity with a rate of spread of 300 to 600 feet per hour and flame lengths of 4 to 6 feet. Ladder fuels pose the potential for a crown fire.*

***Tactical decision for Project:** The Defense Zone was selected to protect the community of Tahoma from a fire initiating on Sugar Pine State Park and entering community. A southern wind would drive a fire into the community and prevent fire suppression resources from having a safe place to stop a fire.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Third

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

TSH1 surround the southern portion of the Tahoma/South Homewood community.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

***Stream Environment Zones Prescription:** Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.*

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

Prescribed Burning in Forests. 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 three inches dbh. Use fire to prune ladder fuels by scorching the lower 1/3 of branches on 100% of trees less than eight inches dbh. Retain large down logs (14 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:

- six foot maximum scorch height; and,
- less than 10% mortality in conifers > 12 inches dbh.

Do not ignite fires in stream environment zones (SEZs). 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 10-hour fuels (<1 inch diameter) should be consumed in SEZs.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classifications 1A and 3. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classifications and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area.

Multiple old roads and trails exist within the project area. These roads and trails should allow mechanical operations to occur without impacting the sensitive resources identified by the landuse class.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$2,500 per acre
\$2,500.00 x 149 acres = \$372,500

Total = \$372,500

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.





Figure 23.
Proposed Projects Upper/Lower Rubicon

Legend

- Proposed Project
- Fire Behavior Sample Location
- Community



0 0.05 0.1 0.15 0.2 0.25 Miles

Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Meeks Bay

Name of Community: Upper/lower Rubicon

Date: November 2004

Project Title: Upper/Lower Rubicon 1-ULR1

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project area contains NFFL fuel model 10. A fire would be a high intensity surface fire with a rate of spread of 500 feet per hour and flame lengths of 4 to 6 feet. Dense ladder fuels will result in a passive crown fire.*

***Tactical decision for Project:** Urban Lot was selected to protect homes from a fire that initiates on CA State Hwy 89 with a southerly wind which would drive it into the community before any suppression resources could effectively contain the fire.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Third

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

URL1 is in the center of the Upper/Lower Rubicon community.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

Urban Lots

Fuels treatment on urban lots are generally conducted by hand thinning and designed to remove excessive fuels, thereby altering fire behavior and reducing the ability of a wildfire to move to neighboring lots. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. Urban lots will have about 40% canopy cover and will be approximately 110 to 150 sq ft basal area.

Urban lot prescriptions are accomplished through a specific combination of thinning with either pile burning or chipping as the disposal method. Implementation of the prescriptions is unique given the proximity to structures and the relatively easy access to the forest stand. Though hand thinning has been the favored treatment technique, mechanical thinning and mastication with small machines should be evaluated as an alternative cost-effective method of treating urban fuels.

***Urban Lot Prescription.** Reduce the potential for crown fires by increasing the crown base height to at least 20 feet. Starting with the smallest diameter class and remove suppressed and intermediate trees to achieve the prescribed crown base height. Remove ground fuels greater than three inches diameter and treat shrub densities to achieve flame lengths of no more than two feet.*

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classifications 1A and 3. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classifications and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area.

Mechanical equipment can be limited to the roadway, with hand crews pulling material to the edge of the road for disposal.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

*Urban Lots \$4,075 per acre
\$4,075.00 x 5 acres = \$20,375*

Total = \$20,375

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated by hand or mechanical methods every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Meeks Bay

Name of Community: Upper/Lower Rubicon

Date: November 2004

Project Title: Upper/Lower Rubicon 2-ULR2

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project area contains NFFL fuel model 10. A fire would be a high intensity surface fire with a rate of spread of 500 feet per hour and flame lengths of 4 to 6 feet. Dense ladder fuels will result in a passive crown fire.*

***Tactical decision for Project:** Defense Zone was selected to protect homes in the community from a wildfire initiating on LTBMU land and burning into the community. The fuels in this zone are made up of high surface fuel loading 23 tons per acre with a very dense understory of trees less than 7 inches in diameter.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Third

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

ULR3 is west of the Upper/Lower Rubicon community.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

***Stream Environment Zones Prescription:** Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.*

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

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. Chips scattered throughout the project area will not exceed four inches in depth.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classifications 1A and 3. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classifications and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Mechanical operations are required for the cost effective completion of this project. Over the snow operations will not mitigate heavy surface fuels.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$4,600 per acre
\$4,600 x 35 acres = \$161,000

Total = \$161,000

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: Meeks Bay

Name of Community: Meeks Bay

Date: November 2004

Project Title: Community Defensible Space Program

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** Numerous private lots within the MBFPD contain hazardous wildland fuels. These fuels pose a hazard to structures located on the lots or adjacent lots. Significant structure loss will result from the proximity of wildland fuels during a wildfire event.*

***Tactical decision for Project:** The MBFPD would like to provide landowners assistance in establishing effective defensible space around structures.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

All private land lots less than 2 acres within the Meeks Bay Fire Protection District

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

Urban Lots

Fuels treatment on urban lots are generally conducted by hand thinning and designed to remove excessive fuels, thereby altering fire behavior and reducing the ability of a wildfire to move to neighboring lots. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. Urban lots will have about 40% canopy cover and will be approximately 110 to 150 sq ft basal area. On steep slopes, tree spacing may be increased. The Living with Fire in the Tahoe Basin guidelines should be used in creating effective defensible space.

Urban lot prescriptions are accomplished through a specific combination of thinning with either pile burning or chipping as the disposal method. Implementation of the prescriptions is unique given the proximity to structures and the relatively easy access to the forest stand. Though hand thinning has been the favored treatment technique, mechanical thinning and mastication with small machines should be evaluated as an alternative cost-effective method of treating urban fuels.

***Urban Lot Prescription.** Reduce the potential for crown fires by increasing the crown base height to at least 20 feet. Starting with the smallest diameter class and remove suppressed and intermediate trees to achieve the prescribed crown base height and tree spacing. Remove ground fuels greater than three inches diameter and treat shrub densities to achieve flame lengths of no more than two feet. Dispose of biomass material through chipping.*

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a Bailey Land Classifications 1A. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classifications. The Bailey Land Class should be ground verified to ensure they apply to the project area.

Mechanical equipment can be limited to the roadway, with hand crews pulling material to the edge of the road for disposal.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Community Defensible Space \$2,500 per acre
\$2,500 x 435 acres = \$1,088,000 Total = \$1,088,000

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated by hand or with mechanical means every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.

4. NORTH TAHOE FIRE PROTECTION DISTRICT

4.1 Demographics, location, topography, and climatic data

The North Tahoe FPD is located along the north and west shores of Lake Tahoe in Placer County, California (figure 24). The District serves various unincorporated communities from the California/Nevada state line on the north to the Placer/El Dorado Co. line in Tahoma. The area served is approximately 34 square miles with additional services provided beyond the District boundaries to the communities of Alpine Meadows (full services) and El Dorado Co. to Emerald Bay (ambulance service only). A summary of land management in the District's service area is provided in Table 26.

Table 26: Land Management Acreage within the North Tahoe FPD

Land Administrator	ACRES
State of California	7633
LTBMU	11586
Private/Municipal	5212
Total	14431

The area served has a permanent population of approximately 15,000 residents and a seasonal fluctuation of up to 50,000 visitors. The economy is primarily tourist-based with governmental agencies and ski resorts as the major employers.

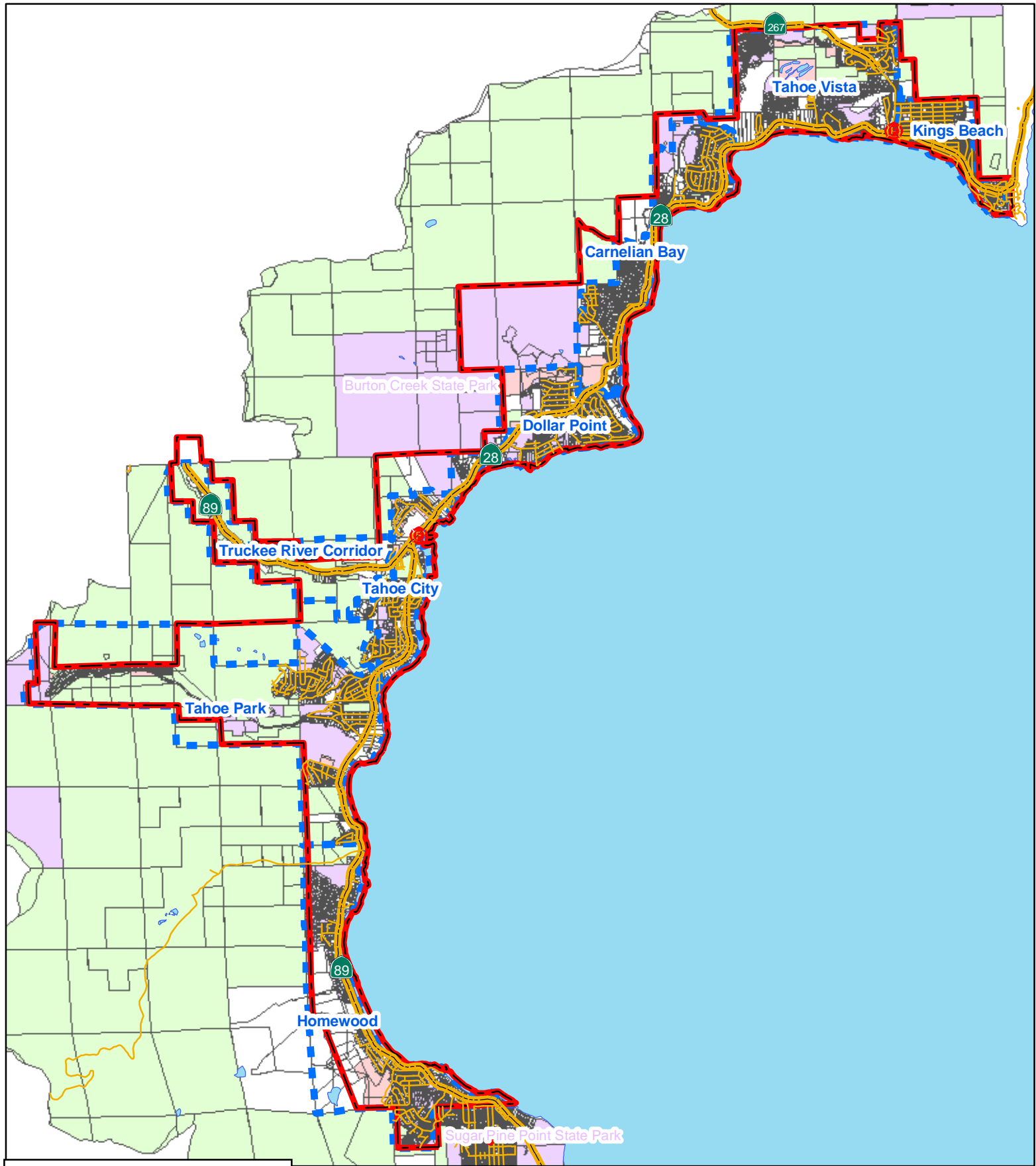
The elevation within the NTFPD ranges from lake level of approximately 6225 to mountaintops in excess of 8,000 feet. The Lake's only outlet is the dam in Tahoe City, which supplies water to downstream users (Truckee River) at Pyramid Lake. The area averages over 300 inches of snowfall annually as the major source of in-flow to the Lake.

4.2 Fire District Overview

Wildfire Protection Resources

Wildland firefighting suppression resources rapidly available to the North Tahoe Fire Protection District include:

- Meeks Bay Fire Protection District
- The City of South Lake Tahoe Fire Department
- Lake Valley Fire Protection District
- Fallen Leaf Fire Protection District
- Squaw Valley Fire Department
- North Lake Tahoe Fire Protection District
- Tahoe Douglas Fire Protection District
- Truckee Fire Protection District
- Northstar Fire Department



Legend

Owner

Private

Federal

Local

State

Fire Station

Community

Fire District

Lake

Roads

Paved/Gravel

Highways

Figure 24.

North Tahoe Fire Protection District

0 1 2 3 4 5 Miles

-
- USFS Lake Tahoe Basin Management Unit
 - CDF
 - Lake Tahoe Regional Fire Chiefs Association Mutual Aid Agreement
 - California Master Mutual Aid Agreement
 - California State Parks

The entire fire district is classified by the State of California as State Responsibility Area (SRA). This means the responsibility for prevention and suppression of wildland fires is the responsibility of the California Department of Forestry and Fire Protection. Due to the substantial amount of Federal land in the Tahoe Basin, the State of California has contracted with the U.S. Forest Service to provide these direct protection responsibilities on their behalf. Services related to prevention and suppression of fires on improvements is the responsibility of the Fire District.

By Cooperative Agreement with the USFS, the NTFPD provides initial attack on all wildland fires within the District. This automatic aid effort helps to ensure fires are contained to a small manageable size. Should firefighting efforts extend beyond an initial three-hour period, the federal government compensates the fire district for labor and equipment rental.

In addition to the cooperative arrangement between the NTFPD and the USFS, the Lake Tahoe Regional Fire Chiefs Agreement serves to reinforce cooperation between local, state, and the federal governments. This mutual aid agreement between local government agencies within the greater Lake Tahoe and western Nevada areas provides free support to its membership and assistance for hire to State and Federal Agencies. The gateway to these local resources comes from the Placer/Tahoe Dispatch Center in Tahoe City and the Tahoe Basin Operational Area Coordinator.

The NTFPD is also a signatory to the California Master Mutual Aid System. As a system participant, North Tahoe has access to free firefighting resources throughout the State of California.

The NTFPD employs 36 career firefighters and 20 part-time firefighters. A majority of the firefighters are trained to the level of paramedic licensure. The District is governed by a five member Board of Directors who represent five geographically distinct areas. The annual operating budget is approximately \$6.8 million dollars. The District staffs three fire stations 24/7/365 with a fourth station having been converted to an apparatus repair facility. The District's fifth fire station is a resident fire station for four of the District's part-time firefighters. The District's Strategic Master Plan guides decision-making by executive staff and the Board of Directors.

The District maintains six type-1 fire engines, three type-3 fire engines, a 3000-gallon water tender, eight paramedic ambulances, and numerous support and command vehicles. The District's objective is to have the first arriving units on scene within 4-6 minutes

with the balance of resources on first alarm arriving on scene within 12-15 minutes. The District meets this objective in excess of 90% of the time.

Water Sources and Infrastructure in the District

Water supplies for firefighting efforts come primarily from roughly 850 fire hydrants. The majority of the fire hydrants are owned and operated by two Public Utility Districts (NTPUD and TCPUD). These agencies do a good job providing adequate water storage and distribution. Cooperation is excellent between these districts and the NTFPD. The NTFPD is routinely consulted during long-range planning for correction of deficiencies, including issues like hydrant placement. The Fire District provides minimal maintenance on hydrants through annual flow testing, lubrication, and staking. Both water districts are responsive to requests for repairs to hydrants in need of repair.

The 14 privately held water systems pose a significant concern. In many cases, these systems lack adequate storage and size of main/lateral lines. Many of these private water systems do not provide standby generators or adequately fund system upgrades.

There are also areas where no fire hydrants exist. In these areas (and in those underserved areas with inadequate flow and storage) the NTFPD supports its firefighting efforts with district water tenders and/or mutual aid water tenders.

Every effort is made to educate water purveyors on the impact of inadequate water supply on firefighting efforts. While the public water districts are responsive, limited financial resources preclude the private systems from accomplishing much beyond maintenance. As new development projects come on line, the NTFPD conditions approval on water storage and distribution improvements.. The District has testified at P.U.C. hearings in support of private water system rate increases when a portion of the new revenue can be earmarked for system improvements.

The NTFPD has split ISO ratings across its district. Those areas served by hydrants have a rating of 4, those areas outside of hydrants service areas are rated 8 through 10 depending on the distance to the nearest fire station.

Fire Protection Personnel Qualifications

All NTFPD personnel are trained to a minimum of California State Fire Marshall firefighter 1 and thereafter firefighter 2. Annual wildland firefighter training is required in conjunction with the NWCG 310-1 curriculum. Captains and Chief Officers are trained and red carded with the California Incident Command Certification System to various levels including engine officer, strike team leader, and various positions on the incident management teams.

NTFPD Detection and Communication

All emergencies are reported via the “911” system operated by the Placer County Sheriff’s Office in Tahoe City. Two mountaintop repeaters provide adequate radio communication coverage throughout the Fire District. Radio systems are compatible with all mutual and automatic aid neighbors and cooperators. All personnel are assigned radios

when on-duty with pagers 24/7/365. All command personnel also have cell phones for further communication.

Dispatching for wildland fires is handled by the inter-agency dispatch center in Camino, California. Adequate repeaters are available for command and control purposes. “911” calls for wildland fire are coordinated between the two dispatch centers with Camino having direct jurisdictional responsibility. Camino is also the gateway to State and Federal firefighting assets such as air tankers, helicopters, dozers and crews.

Work Load

The North Tahoe Fire Protection District responds to an average of 2,100 emergencies each year, of which approximately 50-60 are fire related.

4.3 Community Preparedness

The NTFPD has an active wildfire prevention program. The district distributes information to the public regarding defensible space and appropriate building materials. Through grants with the USFS, Lake Tahoe Basin management Unit and the California Department of Forestry and Fire Protection, the district has operated a curbside chipping program to provide residents with solutions for disposing of defensible space material.

Placer County is completing its County-wide hazard mitigation plan, of which the NTFPD is a part.

Pre fire engineering is an important element of community preparedness in the NTFPD. The district and Placer County have a number of standards and ordinances, based on California Public Resources Code 4290, in place to address community design issues regarding wildfire hazard preparedness. Ordinances specify details such as:

- Road, driveway and turnaround dimensions to provide safe ingress and egress for the public and fire suppression resources during a fire event.
- Emergency water supply for sustained firefighting operations.
- Use of flame-resistant building materials in home construction, specifically in roofing and siding materials.

In addition to the codes and ordinances for community design, the NTFPD has created Planned Community Development Guidelines and Conditions for subdivisions based on the codes and ordinances. The document provides developers guidelines on mitigation measures and community design guidelines for subdivision construction in the NTFPD, streamlining the approval process by illustrating approved community design elements in the NTFPD. These guidelines are available in Appendix F.

The NTFPD or Placer County should consider reviewing its codes and ordinances regarding the use of flame-resistant siding and roofing materials. While a single non-flammable standard across the NTFPD would not be publicly acceptable (due to a desire to keep building materials consistent with historic architecture), some high risk areas within the district need to adopt a non-flammable standard for building materials. The district could develop risk zones, similar to the manner in which San Diego County

defines fire safe standards. Depending on your wildfire risk zone, non-flammable building material regulations would be more or less restrictive. For example, the Talmont community would have non-flammable standards while the portion of the Tahoe City community on the lake shore would have Flame-resistant standards.

4.4 Hazard Assessment

The North Tahoe Fire Protection District is divided into seven communities (each broken down into neighborhoods) to assess the structural ignitibility and hazards within the district. The communities are:

- Carnelian Bay
 - Carnelian Bay
 - Cedar Flat
- Dollar Point
 - Dollar Point
 - Highlands
 - Lake Forest
- Homewood
 - Homewood
 - McKinney
 - Tahoma
- Kings Beach
 - Kings Beach
- Tahoe City
 - Tahoe City
- Tahoe Park
 - Tahoe Park
 - Talmont
- Tahoe Vista
 - Agate Bay
 - Tahoe Vista

The Alpine Meadows community and Juniper Mountain Homeowners Association will be included in this plan when an assessment can be completed and mitigation projects developed. A letter from the homeowners association with map of the high hazard area is included in Appendix B

NTPFD fire protection district personnel conducted an assessment of building materials and defensible space within the communities. The results of this survey are provided in Table 27.

Table 27. Structural ignitability factors for the Communities served by the NTFPD.

Percentage of Lots and Homes				
Community/ Neighborhood		Without Defensible Space	With Flammable Unenclosed Structures	Structural Rating
Carnelian				
	Carnelian Bay	91%	47%	High
	Cedar Flat	94%	29%	High
Dollar Point				
	Dollar Point	97%	47%	Extreme
	Highlands	82%	43%	Extreme
	Lake Forest	96%	67%	High
Homewood				
	Homewood	45%	76%	High
	McKinney	91%	83%	High
	Tahoma	91%	83%	Moderate
Kings Beach				
	Kings Beach	93%	59%	Extreme
Tahoe City				
	Tahoe City	89%	48%	High
Tahoe Park				
	Tahoe Park	94%	64%	Moderate
	Talmont	91%	61%	Extreme
Tahoe Vista				
	Agate Bay	89%	61%	High
	Tahoe Vista	86%	66%	High

The number of homes with flammable roofs, flammable siding, unenclosed structures (which can trap embers) and the number with inadequate defensible space were tallied. The results of the structural ignitability assessment illustrate the need for homeowners to address building materials and defensible space around their homes. In general, most structures do not have both appropriate roofing and siding materials. The majority of structures have decks and overhanging unenclosed features where embers can be trapped and ignite a home. Defensible space is also lacking around most structures.

The Living with Fire in the Tahoe Basin guidelines illustrates the dangers of flammable building materials and inadequate defensible space. Burning embers from a wildfire can land on or become trapped in cracks in roofing and siding material, causing the fire to spread to the home. Unenclosed structures allow burning embers and heat to become trapped, also spreading the fire from the wildland to the home. Direct flame contact to the home due to lack of defensible space will also result in the loss of a home. All of these factors put homes at a higher risk of destruction during a wildfire event.

Any one of these building materials and construction issues could result in the loss of a home during a fire event. Simply replacing a shake roof does not provide appropriate protection if other building material issues are lacking. For structure defense to be effective, all building materials must be non-flammable and openings that trap embers must be closed. Residents can contact the NTFPD for guidance on appropriate building materials and construction issues.

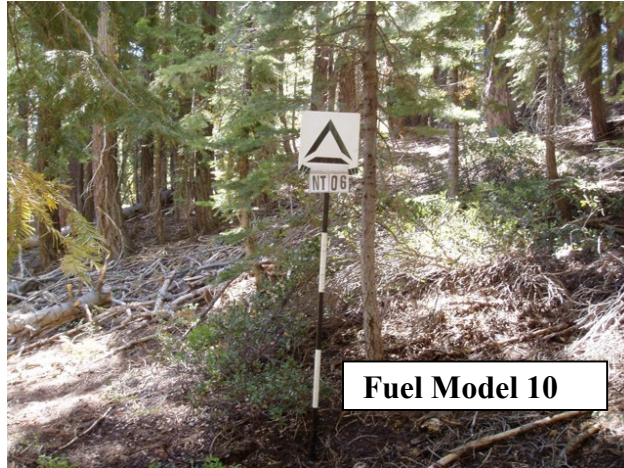
Fire Behavior Analysis

Twelve forest sampling plots were recorded in the North Tahoe Fire Protection District communities to use in fire behavior modeling. Photographic examples of the different fuel models found in the NTFPD follow the results in Table 28.

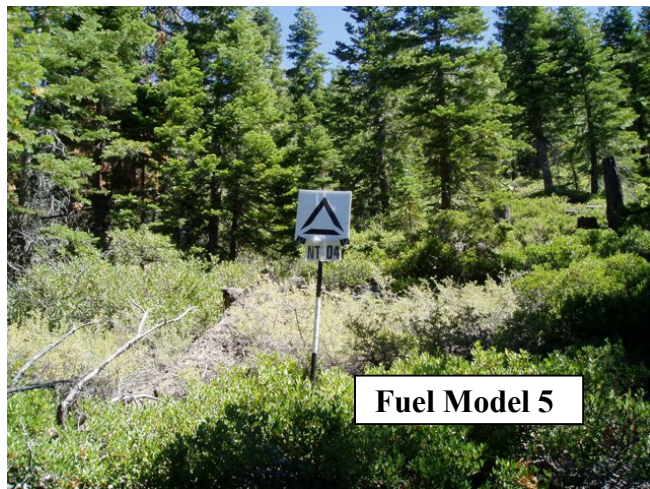
Table 28: Fire Behavior Analysis

Community	Plot Number	Fuel Model	Canopy Base Height	Basal Area	Flamlength (feet)	Rate of Spread (feet per hour)	Fire Type
Homewood	NT 1	5	5	177	3.8	917	Passive Crown
	NT 2	10	8	114	3.4	343	High Intensity Surface Fire
Kings Beach	NT 3 - 4	5	3	60	5.3	1465	Passive Crown
Tahoe Park	NT 5	10	5	184	5.3	614	Passive Crown
Tahoe Vista	NT 8	8	32	225	0.7	79	Low Intensity Surface Fire
	NT 9	10	2	693	3.4	337	Passive Crown
	NT11	10	3	108	5	554	Passive Crown
Carnelian Bay	NT 12	10	1	140	5	554	Passive Crown
Dollar Point	NT 13	10	37	202	6.4	726	High Intensity Surface Fire
Tahoe City	NT 14	10	5	264	4.8	515	Passive Crown

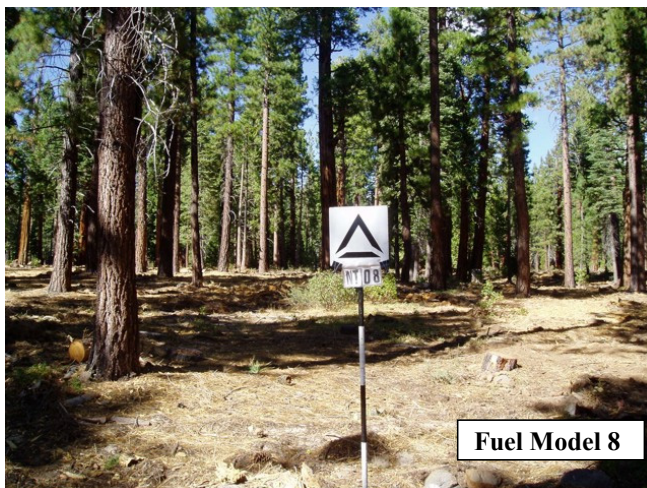
All but one of the plots have fuel loadings, fire behavior characteristics, and forest stand structures that exceed the objectives established earlier in this document. The plot that meets those objectives, NT8 is a sample plot located on a LTBMU treated lot within the Tahoe Vista community. It demonstrates the fire behavior and forest health conditions when the mitigation objectives are met.



The fire behavior analysis demonstrates the different challenges the Meeks Bay communities face with current fuel conditions. Note the in communities with fuel model 10 (see photo) that as rate of spread increases, so does flame length. Given that flame lengths of 3 feet are difficult to control under the best of circumstances, fire behavior in most of these plots will be uncontrollable with the immediate suppression resources available in the district.



KB3 and KB4 demonstrates a difference challenge. Fuel model 5 (see photo) is a brush fuel model, so flame lengths are smaller than they are in timber fuel models. But the rate of spread is significantly higher. Lower flame lengths allow easier control of the fire, but the rate of spread is too fast for initial attack suppression resources to contain.



In addition to the elements addressed in the structural ignitability section, fire district personnel evaluated the Meeks Bay communities on a number of other criteria including slope, aspect, community design, and fire suppression infrastructure. Combined with the results of the structural assessment, each community was given a community rating.

Table 29: Assessment Measures

Community/ Neighborhood		Structural Rating	Fire Behavior Rating	Neighborhood Assessment
Carnelian Bay				
	Carnelian Bay	High	High	High
	Cedar Flat	High	High	High
Dollar Point				
	Dollar Point	Extreme	High	Extreme
	Highlands	Extreme	Extreme	Extreme
	Lake Forest	High	Extreme	Extreme
Homewood				
	Homewood	High	Moderate	High
	McKinney	High	Moderate	High
	Tahoma	Moderate	High	High
Kings Beach				
	Kings Beach	Extreme	Extreme	Extreme
Tahoe City				
	Tahoe City	High	High	High
Tahoe Park				
	Tahoe Park	Moderate	High	High
	Talmont	Extreme	Extreme	Extreme
Tahoe Vista				
	Agate Bay	High	High	High
	Tahoe Vista	High	High	High

4.5 Mitigation Measures

Residents and Landowners

Residents and private landowners are the most effective group in mitigating wildfire hazards. Defensible space, building materials, and home construction guidelines are designed to reduce the risk of structure loss during a wildfire to less than 1%, according to *Living with Fire in the Tahoe Basin* publication (Smith 2004). If completed implemented, almost all structures within a community will survive a wildfire even if no community mitigation projects have been implemented. Landowners must take an active role in addressing these hazards on their property.

The results of the structural assessment conclude that most homes need to improve some component of defensible space, building materials, or home construction. California Public Resources Code 4291 (PRC 4291) requires homeowners to address wildland fire hazards through creation of defensible space and other building construction mitigation measures. Specifically, the code requires homeowners to:

-
- Maintain adequate defensible space 30 feet around structures (this will increase to 100 feet January 1, 2005)
 - Remove that portion of any tree which extends within 10 feet of the outlet of any chimney or stovepipe.
 - Maintain any tree adjacent to or overhanging any building free of dead or dying wood.
 - Maintain the roof of any structure free of leaves, needles, or other dead vegetative growth.
 - Provide and maintain at all times a screen over the outlet of every chimney or stovepipe that is attached to any fireplace, stove, or other device that burns any solid or liquid fuel. The screen shall be constructed of nonflammable material with openings of not more than one-half inch in size.

To address these issues, residents must educate themselves on the *Living with Fire in the Tahoe Basin* guidelines and review their property for needed improvements (Smith 2004). If residents have questions regarding the information, they should contact their local fire district to review their property and provide guidance.

The *Living with Fire in the Tahoe Basin* guidelines provide significant detail regarding the spacing and removal of trees and shrubs from around the homes (Smith 2004). Recommended spacing are commonly a minimum, residents may wish to remove more vegetation where regulations allow. On vacant lots and in the defense zone on their properties residents and landowners should provide at least 10 feet of spacing between trees, greater distances on slopes over 20%. When choosing which trees and shrubs to remove on their property, preference should be given to those individuals that are smaller and suppressed. Removal of this vegetation is less likely to require permits than larger trees and leaves the more desirable trees.

Maintaining defensible space is a continuous process. Each year residents and landowners should re-evaluate their property to ensure proper defensible space criteria are met.

Community Defensible Space Program

To assist local landowners with disposal of the biomass material generated by creating defensible space, the NTFPD and Tahoe Basin Fire Safe Council must continue the community defensible space program. Demand for the program is positive and most programs rely on grant funding to operate. Additional grant funding should be secured to continue this program.

Assuming a 100% participation rate of properties under 2 acres, the cost estimate for the community chipper program in NTFPD is \$5,746,000.

Fuels Reduction Projects

To address the community hazards a number of mitigation projects were developed. Fuels reduction projects are designed to address the fuel hazards within and around the communities. Where possible, projects address not only the fuel hazard objectives, but

forest and stream environment zone health objectives. The projects are described in detail in the following section.

Developing project priorities is a critical element of the community wildfire protection plan. Priorities were developed using a combination of the available datasets as criteria, including the urban values at risk (Murphy and Knopp 2000), community hazard ratings, fire behavior ratings, project type, and completed treatments in the area. The consultant team rated each of the projects according to the above elements. The fire chief made final adjustments to the ratings based on district specific knowledge.

Prioritizing the top projects in a district fairly clear. Fire professionals across all agencies typically agree on the areas in most dire need of treatment in each district. Prioritizing the projects in the middle can be difficult. A variety of factors can be considered in the prioritization, many canceling the effects of others. Using the five criteria outlined above provided a sound method for project prioritization.

In addition to the projects outlined in this plan, the project work proposed by the LTBMU is also identified. LTBMU staff provided GIS datasets mapping the areas they expect to treat within the next 10 years around communities. These project areas were not included in mitigation projects proposed in this plan and are instead called out separately. Specific prescriptions and treatments have not been identified for these areas, so a uniform cost factor of \$2,500 per acre was used to calculate the total cost for LTBMU projects within the WUI.

Table 30: Summary of Projects, North Tahoe Fire Protection District

Priority	Project Name	Project Type	Project Acres	Rx Cost	Total Project Cost
1	DP1	Defense Zone	80	2500	200,000
2	KB1	Defense Zone	69	2500	172,500
3	HIGH1	Defense Zone	172	2500	430,000
4	DP2	Defense Zone	85	2500	212,500
5	HIGH2	Defense Zone	80	2500	200,000
6	TAL1	Defense Zone	78	4600	358,800
7	CF1	Defense Zone	130	2500	325,000
8	CF2	Defense Zone	137	2500	342,500
9	LF1	Defense Zone	28	2500	70,000
10	LF2	Defense Zone	73	2500	182,500
11	TAL2	Defense Zone	68	2500	170,000
12	CF3	Defense Zone	193	4600	887,800
13	TC3	Defense Zone	55	2500	137,500
14	TC2	Defense Zone	49	4600	225,400
15	TV1	Defense Zone	28	4600	128,800

16	TV4	Urban Lot	117	4075	476,775
17	KB2	Urban Lot	10	4075	40,750
18	TV5	Urban Lot	13	4075	52,975
19	CB1	Defense Zone	115	1200	138,000
20	CB2	Defense Zone	228	4600	1,048,800
21	TV2	Defense Zone	29	4600	133,400
22	TV3	Defense Zone	56	2500	140,000
23	AB1	Defense Zone	82	2500	205,000
24	TAH1	Urban Lot	50	4075	203,750
25	M1	Defense Zone	73	2500	182,500
26	M2	Defense Zone	23	4600	105,800
27	H2	Defense Zone	36	4600	165,600
28	H1	Urban Lot	84	4075	342,300
29	TP2	Defense Zone	206	4600	947,600
30	TP1	Defense Zone	44	2500	110,000
31	TC1	Defense Zone	23	4600	105,800
Total Cost for North Tahoe Fire Protection District					\$8,442,350

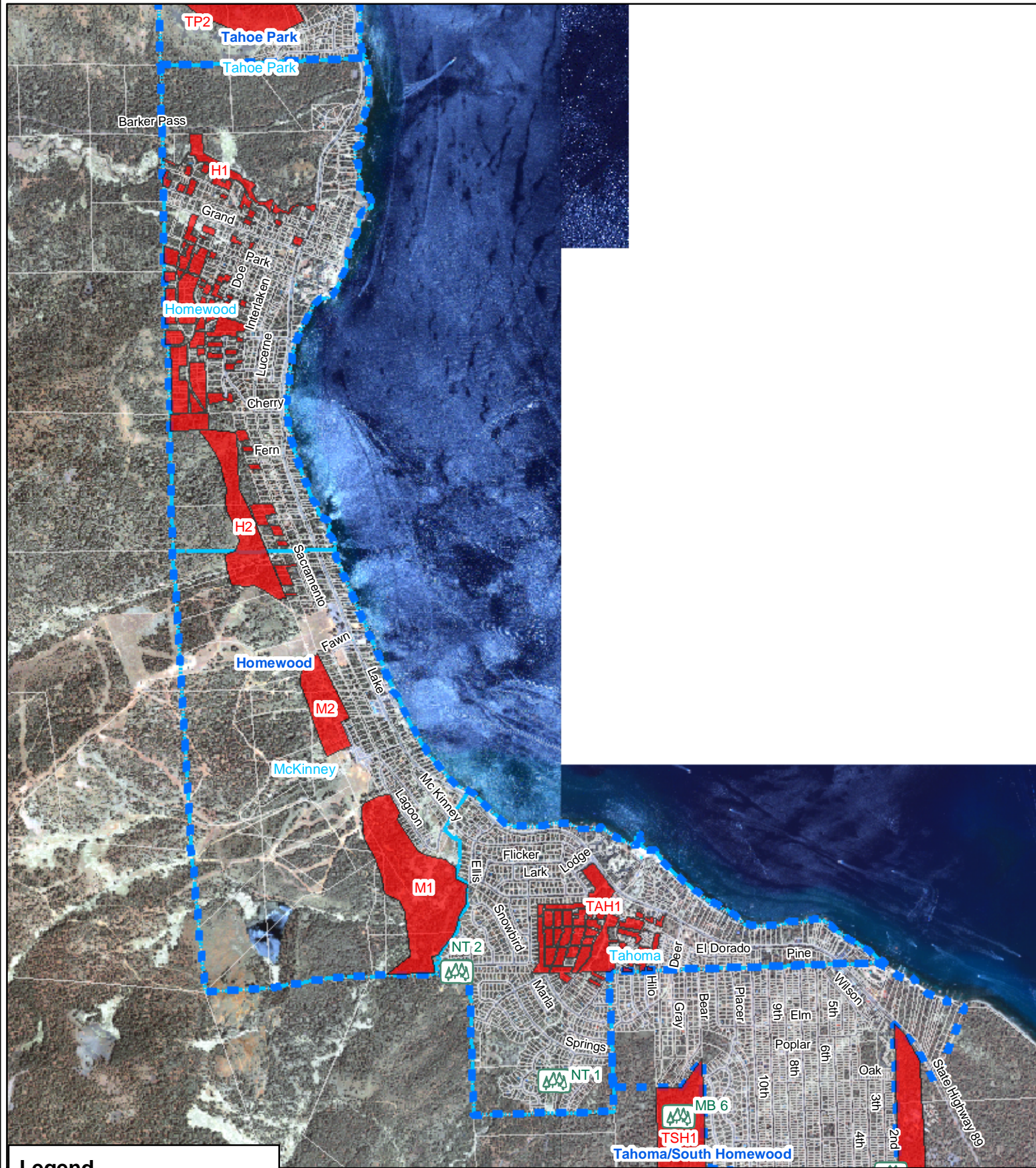
		Community Defensible Space Program			5,746,000
Total Cost for Community Defensible Space Program					\$5,746,000
		Project Proposed by LTBMU in the WUI			2,090,720
Total Cost for Project Proposed by LTBMU					\$2,090,720

Summary of all Project Costs \$16,279,070

The allocation of proposed projects by community and major landowner is summarized below in Table 31.

Table 31: Allocation of Proposed Hazard Mitigation Projects across Ownership

Fire District	Landowner						Total Acres
	LTBMU by Fire District	Future LTBMU	California State Parks	California Tahoe Conservancy	Local Agency	Private	
North Tahoe	555	1,432	387	721	198	3,210	6,503



Legend

- Proposed Project
- Fire Behavior Sample Location
- Community
- Neighborhood

Figure 25.
Proposed Projects Homewood

0 0.25 0.5 0.75 1 Miles



Risk/Hazard Identification and Mitigation Project Worksheet

Fire District: North Tahoe

Name of Neighborhood: Tahoma

Date: November 2004

Project Title: Tahoma 1-TAH1

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project area is a NFFL fuel model 10. A fire in the area would have a rate of spread of 300 feet per hour with flame lengths of 4 to 6 feet. The type of fire would be a high intensity surface fire due to heavy fuel loading on the surface and dense ladder fuels. A passive crown fire is likely.*

***Tactical Decision for Project:** Urban Lot treatment was selected to protect homes from a fire that initiates in the community or from Ca State Hwy 89. The project provides protection inside the community from spotting fire brands. The project is located in urban lots inside the community*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Twenty fourth

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

TAH1 is located in the center of the Tahoma neighborhood.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

Urban Lots

Fuels treatment on urban lots are generally conducted by hand thinning and designed to remove excessive fuels, thereby altering fire behavior and reducing the ability of a wildfire to move to neighboring lots. Trees spacing and ladder fuels will be the same as in the defense zone. Urban lots will have about 40% canopy cover and will be approximately 100-150 sq ft basal area.

Urban lot prescriptions are accomplished through a specific combination of thinning with either pile burning or chipping as the disposal method. Implementation of the prescriptions is unique given the proximity to structures and the relatively easy access to the forest stand. Though hand thinning has been the favored treatment technique, mechanical thinning and mastication with small machines should be evaluated as an alternative cost-effective method of treating urban fuels.

***Urban Lot Prescription.** Reduce the potential for crown fires by increasing the crown base height to at least 20 feet. Starting with the smallest diameter class and remove suppressed and intermediate trees to achieve the prescribed crown base height. Remove ground fuels greater than three inches diameter and treat shrub densities to achieve flame lengths of no more than two feet.*

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within SEZs. The SEZ should be ground verified to ensure they apply to the project area. Mechanical operations can be limited to the exiting road network within the project area. Hand crews can move material to the roadway for processing.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

*Urban Lot \$4,075 per acre
\$4,075 x 50 acres = \$203,750*

Total = \$203,750

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: North Tahoe

Name of Neighborhood: McKinney

Date: November 2004

Project Title: McKinney1–M1

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project area is a NFFL fuel model 10. A fire in the area would have a rate of spread of 300 feet per hour with flame lengths of 4 to 6 feet. The type of fire would be a high intensity surface fire due to heavy fuel loading on the surface and dense ladder fuels. A passive crown fire is likely.*

***Tactical Decision for Project:** The defense zone was selected to protect the community of Tahoma from a fire initiating on LTBMU land and entering community. A southwestern wind would drive a fire into the community and prevent fire suppression resources from having a safe place to stop a fire.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Twenty Fifth

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

M1 is located in the southwestern portion of the McKinney neighborhood.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sites, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

***Stream Environment Zones Prescription:** Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.*

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

Hand Piling and Burning. All cut material and dead and down material greater than 3 inches in diameter and up to 14 inches diameter shall be piled for burning. Piles shall be constructed compactly beginning with a core of fine fuels and minimizing air spaces to facilitate complete combustion. Piles will be constructed at least 1.5 times the diameter of the pile from residual trees and no taller than five feet to prevent damage when burning. If the area will not be broadcast burned, then each pile will be lined with a wet or hand fire line. At least one half of each pile will be covered with water resistant burnable paper to cover the fine material in the center of the piles.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classifications 1A and 3. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classifications and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area.

Mechanical operations are required for the cost effective completion of this project. Over the snow operations will not mitigate heavy surface fuels. The project area is located next to the ski resort where mechanical operations current occur.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$2,500 per acre
\$2,500 x 73 acres = \$182,500

Total = \$182,500

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: North Tahoe

Name of Neighborhood: McKinney

Date: November 2004

Project Title: McKinney 2–M2

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project area is a NFFL fuel model 10. A fire in the area would have a rate of spread of 300 feet per hour with flame lengths of 4 to 6 feet. The type of fire would be a high intensity surface fire due to heavy fuel loading on the surface and dense ladder fuels. A passive crown fire is likely.*

***Tactical Decision for Project:** The defense zone was selected to protect the community of Tahoma from a fire initiating on LTBMU land and entering community. A southwestern wind would drive a fire into the community and prevent fire suppression resources from having a safe place to stop a fire.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Twenty sixth

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

M2 is located in the northern portion of the McKinney neighborhood.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

***Stream Environment Zones Prescription:** Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.*

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

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. Chips scattered throughout the project area will not exceed four inches in depth.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classifications 1A and 3. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classifications and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area.

Mechanical operations are required for the cost effective completion of this project. Over the snow operations will not mitigate heavy surface fuels. The project area is located next to the ski resort where mechanical operations current occur.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$4,600 per acre
\$4,600 x23 acres = \$105,800

Total = \$105,800

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: North Tahoe

Name of Neighborhood: Homewood

Date: November 2004

Project Title: Homewood-H1

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project fire behavior:** The project area is a NFFL fuel model 10. A fire in the area would have a rate of spread of 300 feet per hour with flame lengths of 4 to 6 feet. The type of fire would be a high intensity surface fire due to heavy fuel loading on the surface and dense ladder fuels. A passive crown fire is likely.*

***Tactical Decision for Project:** Urban Lots treatment was selected to protect homes from a fire that initiates in the community or from CA State Hwy 89. The project provides protection inside the community from spotting fire brands. The projects are located in common areas inside the community.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Twenty eight

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

H1 is located throughout the central portion of the Homewood neighborhood.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

Urban Lots

Fuels treatment on urban lots are generally conducted by hand thinning and designed to remove excessive fuels, thereby altering fire behavior and reducing the ability of a wildfire to move to neighboring lots. Trees spacing and ladder fuels will be the same as in the defense zone. Urban lots will have about 40% canopy cover and will be approximately 100-150 sq ft basal area.

Urban lot prescriptions are accomplished through a specific combination of thinning with either pile burning or chipping as the disposal method. Implementation of the prescriptions is unique given the proximity to structures and the relatively easy access to the forest stand. Though hand thinning has been the favored treatment technique, mechanical thinning and mastication with small machines should be evaluated as an alternative cost-effective method of treating urban fuels.

***Urban Lot Prescription.** Reduce the potential for crown fires by increasing the crown base height to at least 20 feet. Starting with the smallest diameter class and remove suppressed and intermediate trees to achieve the prescribed crown base height. Remove ground fuels greater than three inches diameter and treat shrub densities to achieve flame lengths of no more than two feet.*

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classifications 3. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classification and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area. Mechanical operations can be limited to the exiting road network within the project area. Hand crews can move material to the roadway for processing.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

*Urban Lot \$4,075 per acre
\$4,075 x84 acres = \$ 342,300*

Total = \$342,300

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: North Tahoe

Name of Neighborhood: Homewood

Date: November 2004

Project Title: Homewood 2-H2

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project area is a NFFL fuel model 10. A fire in the area would have a rate of spread of 300 feet per hour with flame lengths of 4 to 6 feet. The type of fire would be a high intensity surface fire due to heavy fuel loading on the surface and dense ladder fuels. A passive crown fire is likely.*

***Tactical decision for Project:** The defense zone was selected to protect the community of Homewood from a fire initiating on LTBMU land and entering the community. The Homewood Homeowners Association identified this area as a primary concern for their neighborhood.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Twenty seven

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

H2 is located in the southwestern portion of the Homewood neighborhood.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

***Stream Environment Zones Prescription:** Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.*

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

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. Chips scattered throughout the project area will not exceed four inches in depth.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classifications 1A, 1C and 3. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classifications and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area.

Mechanical operations are required for the cost effective completion of this project. Over the snow operations will not mitigate heavy surface fuels. Alternative transportation techniques such as cable yarding could be employed on this site.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$4,600 per acre
\$4,600 x 36 acres = \$ 165,600

Total = \$ 165,600

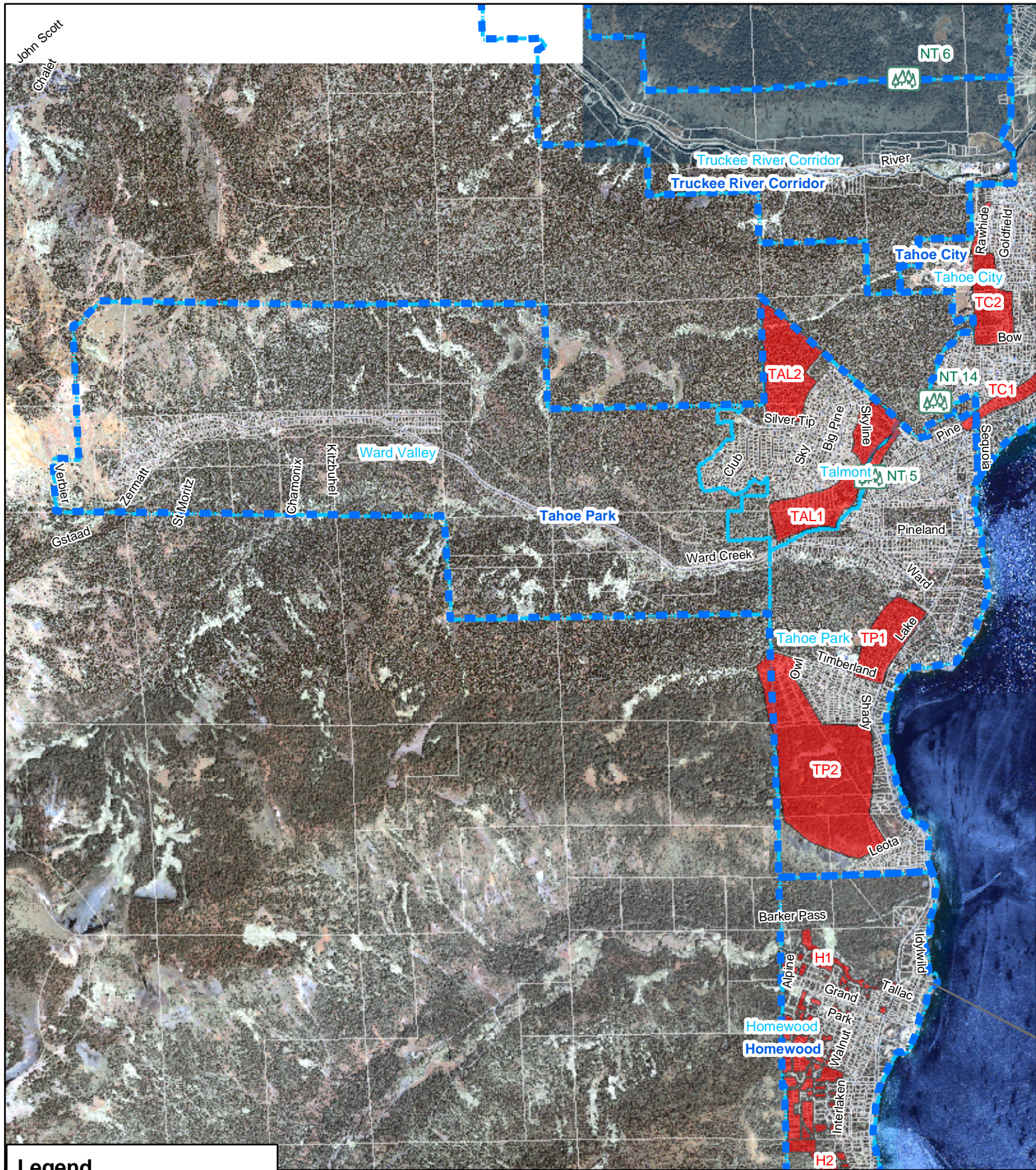
Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.





Legend

- Proposed Project
- Fire Behavior Sample Location
- Community
- Neighborhood

Figure 26.
Proposed Projects Tahoe Park

0 0.25 0.5 0.75 1 Miles



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: North Tahoe

Name of Neighborhood: Tahoe Park

Date: November 2004

Project Title: Tahoe Park 1-TP1

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project area is a NFFL fuel model 10. A fire in the area would have a rate of spread of 300 feet per hour with flame lengths of 4 to 6 feet. The type of fire would be a high intensity surface fire due to heavy fuel loading on the surface and dense ladder fuels. A passive crown fire is likely.*

***Tactical decision for Project:** The project will create a Defense Zone between for the Ward Creek Project State Park protecting the park from a fire initiating along Ca State Hwy 89. Fuel reduction along CA State Hwy 89 would improve evacuation routes and ingress for firefighting apparatus during a fire event. Require the removal smaller trees and the surface fuels.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Thirty

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

TP1 is located in the central portion of the Tahoe Park neighborhood.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

***Stream Environment Zones Prescription:** Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.*

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

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. Chips scattered throughout the project area will not exceed four inches in depth.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within SEZ's. The SEZ should be ground verified to ensure they apply to the project area. Mechanical operations can be limited to exiting roadways and trails, not impacting the SEZ.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$2,500 per acre
\$2,500 x 44 acres = \$110,000

Total = \$110,000

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: North Tahoe

Name of Neighborhood: Tahoe Park

Date: November 2004

Project Title: Tahoe Park 2-TP2

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project area is a NFFL fuel model 10. A fire in the area would have a rate of spread of 300 feet per hour with flame lengths of 4 to 6 feet. The type of fire would be a high intensity surface fire due to heavy fuel loading on the surface and dense ladder fuels. A passive crown fire is likely.*

***Tactical decision for Project:** The defense zone was selected to protect the community from a fire initiating on LTBMU land and entering community. Although the fire would be a backing fire (unless driven by a west wind) it could impact access hindering evacuation and suppression efforts.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Twenty nine

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

TP2 is located throughout the southern portion of the Tahoe Park neighborhood.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

***Stream Environment Zones Prescription:** Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.*

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Hand thinning will be required on the majority of this project due to steep slopes. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

Hand Piling and Burning. All cut material and dead and down material greater than 3 inches in diameter and up to 14 inches diameter shall be piled for burning. Piles shall be constructed compactly beginning with a core of fine fuels and minimizing air spaces to facilitate complete combustion. Piles will be constructed at least 1.5 times the diameter of the pile from residual trees and no taller than five feet to prevent damage when burning. If the area will not be broadcast burned, then each pile will be lined with a wet or hand fire line. At least one half of each pile will be covered with water resistant burnable paper to cover the fine material in the center of the piles.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classifications 1A, 1C and 3. The current proposed prescription of hand treatment is in agreement with the operational constraints within Bailey Landuse Classifications and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$4,600 per acre
\$4,600 x 206 acres = \$ 947,600

Total = \$ 947,600

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: North Tahoe

Name of Neighborhood: Talmont

Date: November 2004

Project Title: Talmont 1-TAL1

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project area is a NFFL fuel model 10. A fire in the area would have a rate of spread of 300 feet per hour with flame lengths of 4 to 6 feet. The type of fire would be a high intensity surface fire due to heavy fuel loading on the surface and dense ladder fuels. A passive crown fire is likely. An escaped fire would burn from the bottom of the slope to the top of the slope, through the community. A southwest wind would push the wildfire quickly into the community.*

***Tactical decision for Project:** Defense Zone was selected to protect homes in the community from a wildfire initiating in the community and burning thru the community. The fuels in this zone are made up of high surface fuel loading greater than 35 tons per acre with an understory of brush and slash. These are very hazardous fuels and if a fire initiates on the south facing slopes it will quickly cut off evacuation routes and fire suppression efforts*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Sixth

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

TAL1 is located in the southeastern portion of the Talmont neighborhood.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

Stream Environment Zones Prescription: Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

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. Chips scattered throughout the project area will not exceed four inches in depth.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classifications 1A, 1C and 3. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classifications and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area.

Mechanical operations are required for the cost effective completion of this project. Over the snow operations will not mitigate heavy surface fuels.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$4,600 per acre
\$4,600 x 78 acres = \$ 358,800

Total = \$ 358,800

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: North Tahoe

Name of Neighborhood: Talmont

Date: November 2004

Project Title: Talmont 2-TAL2

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project area is a NFFL fuel model 10. A fire in the area would have a rate of spread of 300 feet per hour with flame lengths of 4 to 6 feet. The type of fire would be a high intensity surface fire due to heavy fuel loading on the surface and dense ladder fuels. A passive crown fire is likely.*

***Tactical decision for Project:** Defense Zone was selected to protect homes in the community from a wildfire initiating in the community and burning thru the community. The fuels in this zone are made up of high surface fuel loading 35 tons per acre with an understory of brush and slash. Fuel loadings are very hazardous; if a fire initiates on the south facing slopes it will quickly cut off evacuation routes and fire suppression efforts.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Eleventh

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

TAL2 is located in the northern portion of the Talmont neighborhood.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

Stream Environment Zones Prescription: Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

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. Chips scattered throughout the project area will not exceed four inches in depth.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classifications 1A and 3. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classifications and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area. Mechanical equipment can avoid these sensitive areas during project implementation. Every effort should be made to treat these sensitive areas.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$2,500 per acre
\$2,500.00 x 68 acres = \$170,000

Total = \$170,000

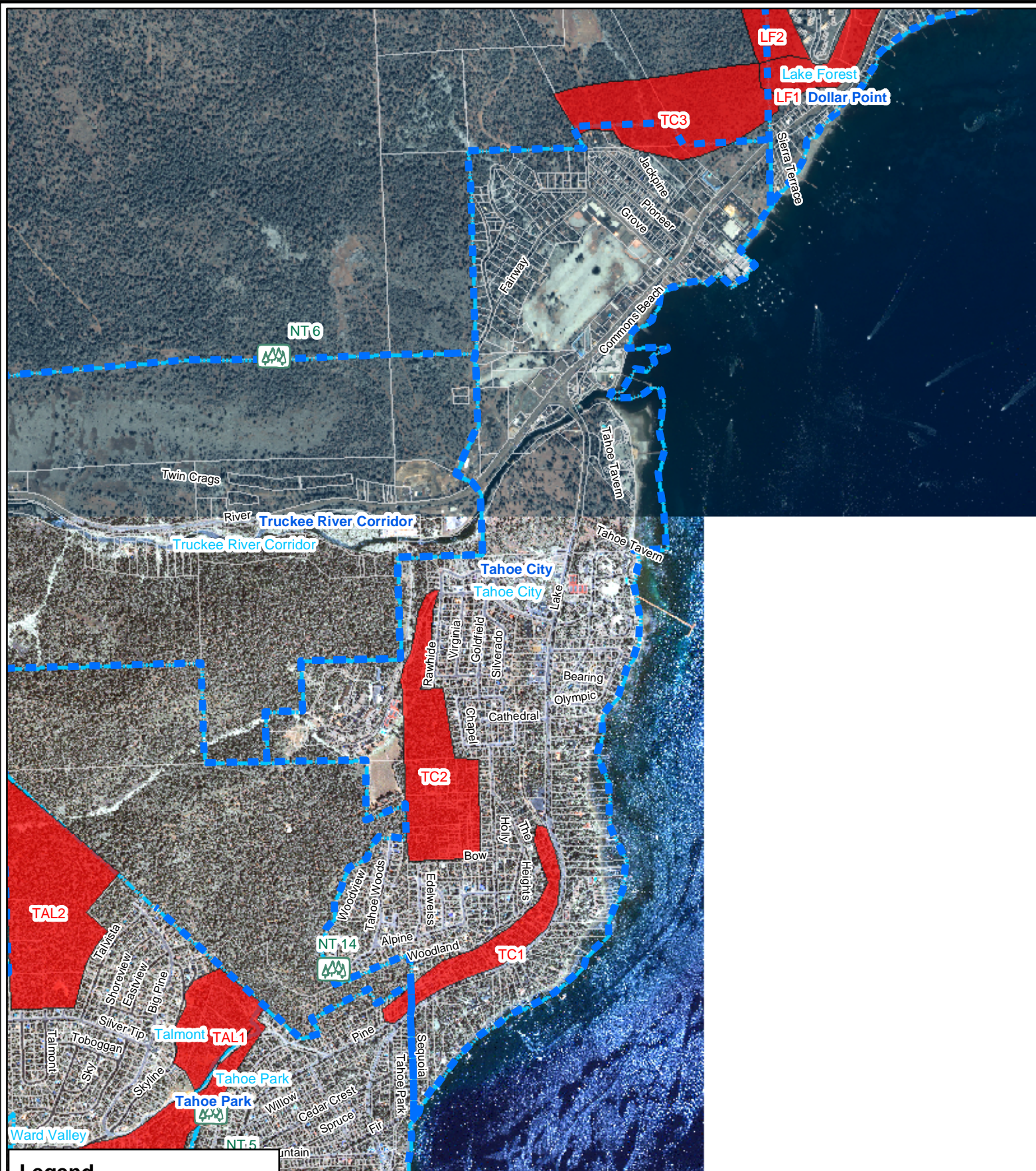
Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.





Legend

- Proposed Project
- ▲▲▲ Fire Behavior Sample Location
- Community
- Neighborhood

Figure 27.
Proposed Projects Tahoe City

0 0.1 0.2 0.3 0.4 0.5 Miles



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: North Tahoe

Name of Neighborhood: Tahoe City

Date: November 2004

Project Title: Tahoe City 1-TC1

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project area is a NFFL fuel model 10. A fire in the area would have a rate of spread of 300 feet per hour with flame lengths of 4 to 6 feet. The type of fire would be a high intensity surface fire due to heavy fuel loading on the surface and dense ladder fuels. A passive crown fire is likely.*

***Tactical decision for Project:** Defense Zone was selected to protect homes from a fire that initiates on LTBMU land during a southwest wind. The wind could push the fire into the community to the east. The project will also provide protection inside the community from spotting fire brands.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Thirty one

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

TC1 is located along the southeastern portion of the Tahoe City neighborhood.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

***Stream Environment Zones Prescription:** Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.*

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

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. Chips scattered throughout the project area will not exceed four inches in depth.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classifications 3. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classification and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area. Mechanical operations can avoid the sensitive areas during project implementation.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$4,600 per acre
\$4,600 x 23 acres = \$ 105,800

Total = \$ 105,800

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: North Tahoe

Name of Neighborhood: Tahoe City

Date: November 2004

Project Title: Tahoe City 2-TC2

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

Pre-project Fire Behavior: *The project area is a NFFL fuel model 10. A fire in the area would have a rate of spread of 300 feet per hour with flame lengths of 4 to 6 feet. The type of fire would be a high intensity surface fire due to heavy fuel loading on the surface and dense ladder fuels. A passive crown fire is likely.*

Tactical decision for Project: *Defense Zone was selected to protect homes from a fire that initiates on LTBMU land during a southwest wind. The wind could push the fire into the community to the east. The project will also provide protection inside the community from spotting fire brands.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Fourteen

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

TC2 is located in the western portion of the Tahoe City neighborhood.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

Forest Stand Prescription: *Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

Brush Prescription: *Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

Thinning: *Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.*

Prescribed Burning in Forests. 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 three inches dbh. Use fire to prune ladder fuels by scorching the lower 1/3 of branches on 100% of trees less than eight inches dbh. Retain large down logs (14 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:

- six foot maximum scorch height; and,
- less than 10% mortality in conifers > 12 inches dbh.

Do not ignite fires in stream environment zones (SEZs). 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 10-hour fuels (<1 inch diameter) should be consumed in SEZs.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including Bailey Land Classifications 1A and 3. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classifications. The Bailey Land Class should be ground verified to ensure they apply to the project area.

Mechanical operations are required for the cost effective completion of this project. Over the snow operations will not mitigate heavy surface fuels.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

*Defense Zone \$4,600 per acre
\$4,600 x 49 acres = \$ 225,400*

Total = \$ 225,400

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: North Tahoe

Name of Neighborhood: Tahoe City

Date: November 2004

Project Title: Tahoe City 3-TC3

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project area is a NFFL fuel model 10. A fire in the area would have a rate of spread of 300 feet per hour with flame lengths of 4 to 6 feet. The type of fire would be a high intensity surface fire due to heavy fuel loading on the surface and dense ladder fuels. A passive crown fire is likely. A southwest wind would move a wildfire quickly into the community.*

***Tactical decision for Project:** The defense zone was selected to protect the community from a fire initiating on Burton State Park entering community. The project protects Burton State Park from a fire initiating in the community. A southern wind would drive a fire into the State Park and prevent fire suppression resources from having a safe place to stop the fire.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Thirteen

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

TC3 is located on the northern border of the Tahoe City neighborhood.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

Stream Environment Zones Prescription: Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

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. Chips scattered throughout the project area will not exceed four inches in depth.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classifications 1C and 2. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classifications and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area. Mechanical operations can avoid sensitive areas during project implementation.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$2,500 per acre
\$2,500 x 55 acres = \$137,500

Total = \$137,500

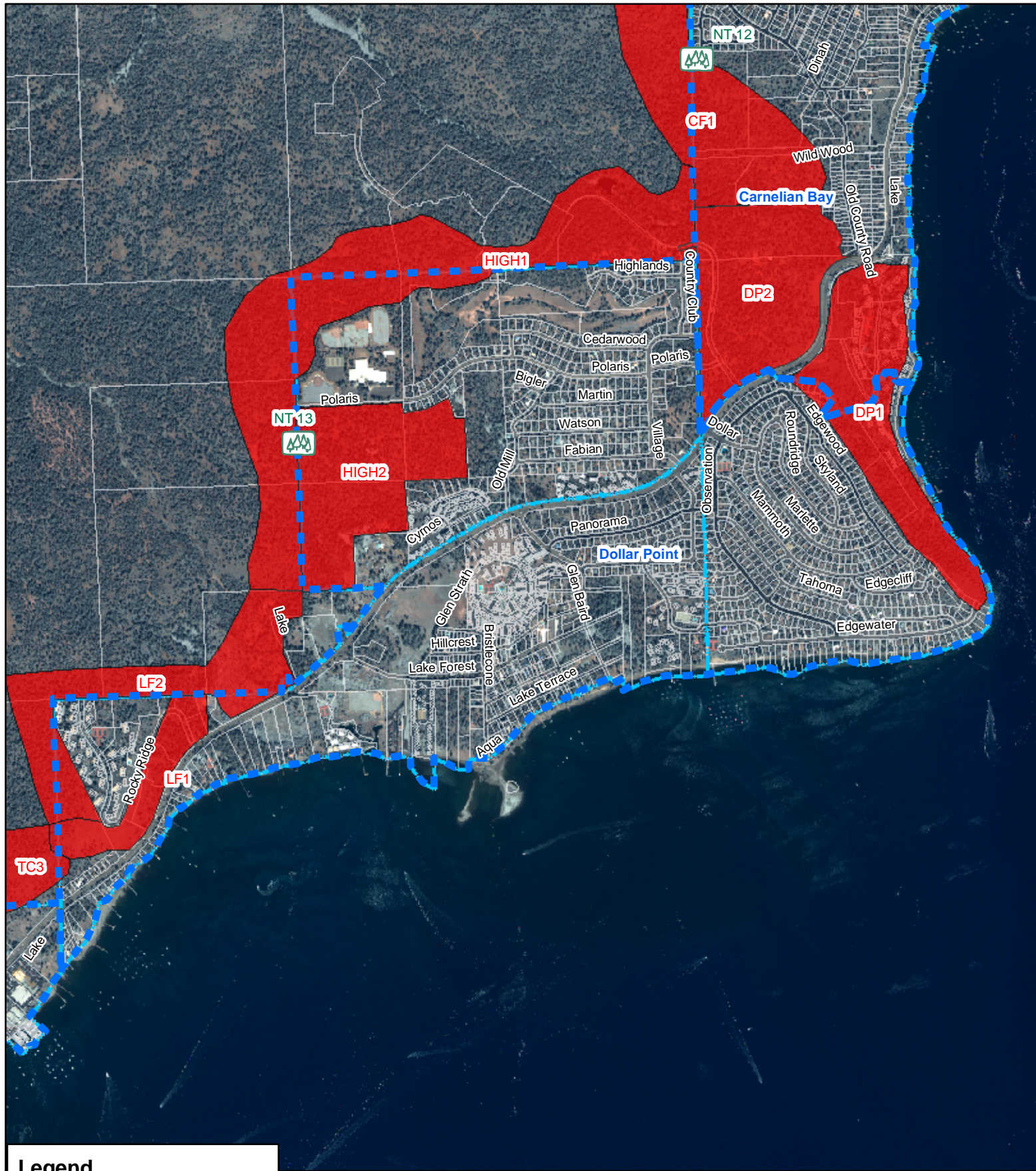
Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.





Legend

- Proposed Project
- AAA Fire Behavior Sample Location
- Community
- Neighborhood

Figure 28.
Proposed Projects Dollar Point



0 0.1 0.2 0.3 0.4 0.5 Miles

Risk/Hazard Identification and Mitigation Project Worksheet

Fire District: North Tahoe

Name of Neighborhood: Lake Forest

Date: November 2004

Project Title: Lake Forest 1-LF1

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** NFFL Fuel Model 5, brush with a rate of spread of 1465-2052 feet per hour, flame lengths of 5-10 feet in very steep terrain a fire would be well established under Southerly winds making suppression difficult cutting off access to the community.*

***Tactical Decision for Project:** Defense Zone was selected to protect homes in the community from a wildfire initiating in the community and burning thru the community. The fuels in this zone are made up of high surface fuel loading 35 tons per acre with an understory of brush and slash. This defense zone will provide protection to the community above CA State Hwy 28 from a fire initiating on the highway.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Nine

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

LF1 is located in the southwestern portion of the Lake Forest neighborhood.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

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. Chips scattered throughout the project area will not exceed four inches in depth.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including Bailey Land Classifications 1C and 2. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classifications. The Bailey Land Class should be ground verified to ensure they apply to the project area.

Mechanical operations are required for the cost effective completion of this project. Over the snow operations will not mitigate heavy surface fuels.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

*Defense Zone \$2,500 per acre
\$2,500 x 28 acres = \$70,000*

Total = \$70,000

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: North Tahoe

Name of Neighborhood: Lake Forest

Date: November 2004

Project Title: Lake Forest 2-LF2

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project area is a NFFL fuel model 10. A fire in the area would have a rate of spread of 300 feet per hour with flame lengths of 4 to 6 feet. The type of fire would be a high intensity surface fire due to heavy fuel loading on the surface and dense ladder fuels. A passive crown fire is likely.*

***Tactical Decision for Project:** The defense zone was selected to protect the community from a fire initiating on Burton State Park entering community. A western wind would drive a fire into the community and prevent fire suppression resources from having a safe place to stop a fire*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Ten

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

LF2 is located on the western border of the Lake Forest neighborhood.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

***Stream Environment Zones Prescription:** Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.*

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

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. Chips scattered throughout the project area will not exceed four inches in depth.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classifications 1C and 2. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classifications and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area.

Mechanical operations are required for the cost effective completion of this project. Over the snow operations will not mitigate heavy surface fuels. Only a small portion of the project is affected by the sensitive areas.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$2,500 per acre
\$2,500 x 73 acres = \$182,500

Total = \$182,500

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: North Tahoe

Name of Neighborhood: Highland

Date: November 2004

Project Title: Highland 1–HIGH1

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project fire behavior:** The project area is a NFFL fuel model 10. A fire in the area would have a rate of spread of 300 feet per hour with flame lengths of 4 to 6 feet. The type of fire would be a high intensity surface fire due to heavy fuel loading on the surface and dense ladder fuels. A passive crown fire is likely.*

***Tactical Decision for Project:** Defense Zone was selected to protect homes in the community from a wildfire initiating outside the community and burning downslope into the community. The fuels in this zone have a high surface fuel loading with an understory of brush and slash*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Third

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

HIGH1 is located along the northern and western borders of the Highland neighborhood.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

***Stream Environment Zones Prescription:** Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.*

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

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. Chips scattered throughout the project area will not exceed four inches in depth.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classifications 1C and 2. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classifications and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area. Mechanical operations can avoid sensitive areas during implementation.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$2,500 per acre
\$2,500 x 172 acres = \$430,000

Total = \$430,000

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: North Tahoe

Name of Neighborhood: Highland

Date: November 2004

Project Title: Highland 2-HIGH2

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project fire behavior:** The project area is a NFFL fuel model 10. A fire in the area would have a rate of spread of 300 feet per hour with flame lengths of 4 to 6 feet. The type of fire would be a high intensity surface fire due to heavy fuel loading on the surface and dense ladder fuels. A passive crown fire is likely. A southwest wind would move a wildfire quickly into the community.*

***Tactical Decision for Project:** Defense Zone was selected to protect homes in the community from a wildfire initiating in the community and burning thru the community. The fuels in this zone are made up of high surface fuel loading 35 tons per acre with an understory of brush and slash. This defense zone will provide protection to the High School and communities near the school. Schools are typically used for evacuation centers. This project must be implemented to make the evacuation center usable.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Fifth

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

HIGH2 is located within the southern portion of the Highland neighborhood.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

Stream Environment Zones Prescription: Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

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. Chips scattered throughout the project area will not exceed four inches in depth.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classifications 2. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classification and SEZs. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area. Mechanical operations can avoid sensitive areas during implementation, only a small portion of the project area is affected.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$2,500 per acre
 $\$2,500 \times 80 \text{ acres} = \$200,000$

Total = \$200,000

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: North Tahoe

Name of Neighborhood: Dollar Point

Date: November 2004

Project Title: Dollar Point 1-DP1

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project area is a NFFL fuel model 10. A fire in the area would have a rate of spread of 300 feet per hour with flame lengths of 4 to 6 feet. The type of fire would be a high intensity surface fire due to heavy fuel loading on the surface and dense ladder fuels. A passive crown fire is likely. A southwest wind would move a wildfire quickly into the community*

***Tactical decision for Project:** Defense Zone was selected due to heavy fuel loading along the road. A fire starting in the area would close access to the structures for suppression equipment and evacuation along CA State Hwy 28. Require the removal smaller trees and the surface fuels. The project will create a Defense Zone between Dollar Point and Cedar Flat.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

First

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

DP1 is located on the western edge of the Dollar Point neighborhood.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

***Stream Environment Zones Prescription:** Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.*

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

Mastication. Where mastication is recommended for projects proposed in this report, use rubber tired or low impact tracked vehicles to cut, chip, and scatter all shrubs and small trees up to 10" dbh on site. Brush cover should be reduced by creating a mosaic of treated and untreated shrubs. Brush that is treated should be cut to the maximum of six inches in height. No individual pieces of cut material shall be greater than 4 feet long. All masticated stumps shall be cut to within six inches of the ground. No debris shall average more than two inches over the entire project area. All cut vegetation will be kept within the unit boundaries. Any cut vegetation falling into ditches, roads, road banks, trails, or adjacent units shall immediately be removed.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classifications 1A, 1C and 3. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classifications and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area.

Mechanical operations are required for the cost effective completion of this project. Over the snow operations will not mitigate heavy surface fuels.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$2,500 per acre
\$2,500 x80 acres = \$200,000

Total = \$200,000

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: North Tahoe

Name of Neighborhood: Dollar Point

Date: November 2004

Project Title: Dollar Point 2-DP2

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project area is a NFFL fuel model 10. A fire in the area would have a rate of spread of 300 feet per hour with flame lengths of 4 to 6 feet. The type of fire would be a high intensity surface fire due to heavy fuel loading on the surface and dense ladder fuels. A passive crown fire is likely. A southwest wind would move a wildfire quickly into the community*

***Tactical decision for Project:** Defense Zone was selected due to heavy fuel loading along the road any fire starting in the area would close access to the structures for suppression equipment and evacuation along CA State Hwy 28. Also, this will create a Defense Zone between Dollar Point and Cedar Flat.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Fourth

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

DP2 is located on the northern border of the Dollar Point neighborhood.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

***Stream Environment Zones Prescription:** Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.*

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

Mastication. Where mastication is recommended for projects proposed in this report, use rubber tired or low impact tracked vehicles to cut, chip, and scatter all shrubs and small trees up to 10" dbh on site. Brush cover should be reduced by creating a mosaic of treated and untreated shrubs. Brush that is treated should be cut to the maximum of six inches in height. No individual pieces of cut material shall be greater than 4 feet long. All masticated stumps shall be cut to within six inches of the ground. No debris shall average more than two inches over the entire project area. All cut vegetation will be kept within the unit boundaries. Any cut vegetation falling into ditches, roads, road banks, trails, or adjacent units shall immediately be removed.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classifications 3. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classification and SEZs. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area.

Mechanical operations are required for the cost effective completion of this project. Over the snow operations will not mitigate heavy surface fuels. The project contains only a small portion of sensitive areas.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$2,500 per acre
\$2,500 x 85 acres = \$212,500

Total = \$212,500

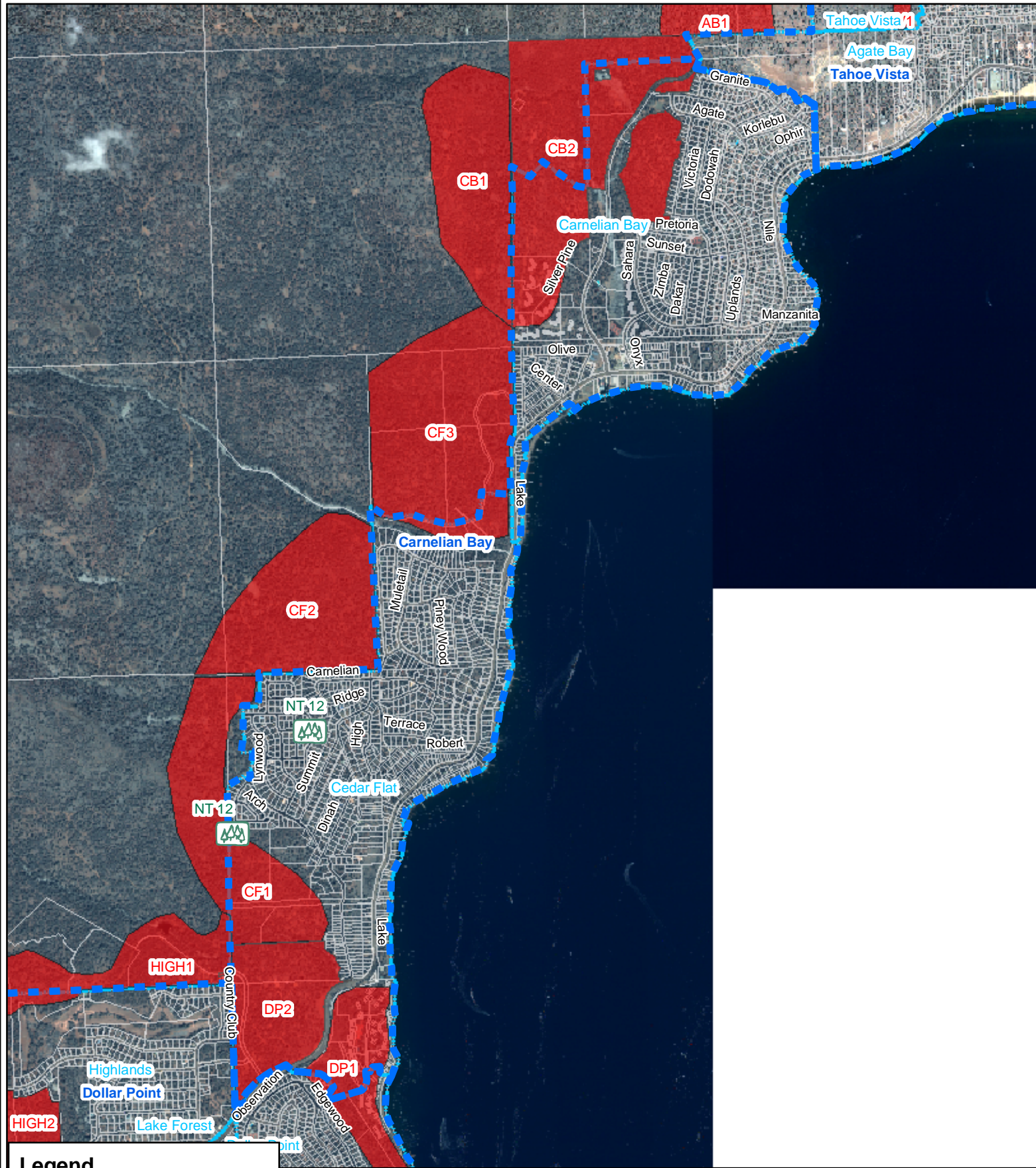
Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.





Legend

- Proposed Project
- Fire Behavior Sample Location
- Community
- Neighborhood

Figure 29.
Proposed Projects Carnelian Bay

0 0.25 0.5 0.75 1 Miles



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: North Tahoe

Name of Neighborhood: Cedar Flat

Date: November 2004

Project Title: Cedar Flat 1-CF1

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project area is a NFFL fuel model 10. A fire in the area would have a rate of spread of 300 feet per hour with flame lengths of 4 to 6 feet. The type of fire would be a high intensity surface fire due to heavy fuel loading on the surface and dense ladder fuels. A passive crown fire is likely. This would allow a wildfire to move quickly into the community*

***Tactical decision for Project:** Defense Zone was selected to protect homes in the community from a wildfire initiating in the community and burning through the community. The fuels in this zone have high surface fuel loadings at 35 tons per acre with an understory of brush and slash.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Seventh

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

CF1 is located on the southwestern border of the Cedar Flat neighborhood.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

***Stream Environment Zones Prescription:** Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.*

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

Mastication. Where mastication is recommended for projects proposed in this report, use rubber tired or low impact tracked vehicles to cut, chip, and scatter all shrubs and small trees up to 10" dbh on site. Brush cover should be reduced by creating a mosaic of treated and untreated shrubs. Brush that is treated should be cut to the maximum of six inches in height. No individual pieces of cut material shall be greater than 4 feet long. All masticated stumps shall be cut to within six inches of the ground. No debris shall average more than two inches over the entire project area. All cut vegetation will be kept within the unit boundaries. Any cut vegetation falling into ditches, roads, road banks, trails, or adjacent units shall immediately be removed.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classifications 1A and 3. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classifications and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area. Mechanical operations can avoid sensitive areas during implementation, only a small portion of the project contains sensitive areas.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$2,500 per acre
\$2,500 x 130 acres = \$325,000

Total = \$325,000

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: North Tahoe

Name of Neighborhood: Cedar Flat

Date: November 2004

Project Title: Cedar Flat 2-CF2

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project area is a NFFL fuel model 10. A fire in the area would have a rate of spread of 300 feet per hour with flame lengths of 4 to 6 feet. The type of fire would be a high intensity surface fire due to heavy fuel loading on the surface and dense ladder fuels. A passive crown fire is likely. This would allow a wildfire from the west to move quickly into the community*

***Tactical decision for Project:** Defense Zone was selected to protect homes in the community from a wildfire initiating in the community and burning through the community. The fuels in this zone are made up of high surface fuel loading 35 tons per acre with an understory of brush and slash.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Eighth

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

CF2 is located on the western border of the Cedar Flat neighborhood.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

***Stream Environment Zones Prescription:** Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.*

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

Prescribed Burning in Forests. 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 three inches dbh. Use fire to prune ladder fuels by scorching the lower 1/3 of branches on 100% of trees less than eight inches dbh. Retain large down logs (14 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:

- six foot maximum scorch height; and,
- less than 10% mortality in conifers > 12 inches dbh.

Do not ignite fires in stream environment zones (SEZs). 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 10-hour fuels (<1 inch diameter) should be consumed in SEZs.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classification 2. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classification and SEZs. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area. Mechanical operations can avoid sensitive areas during implementation, only a small portion of the project contains sensitive areas.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$2,500 per acre
\$2,500 x 137 acres = \$342,500

Total = \$342,500

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: North Tahoe

Name of Neighborhood: Cedar Flat

Date: November 2004

Project Title: Cedar Flat 3-CF3

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project area is a NFFL fuel model 10. A fire in the area would have a rate of spread of 300 feet per hour with flame lengths of 4 to 6 feet. The type of fire would be a high intensity surface fire due to heavy fuel loading on the surface and dense ladder fuels. A passive crown fire is likely. This would allow a wildfire from the west to move quickly into the community*

***Tactical decision for Project:** Defense Zone was selected to protect the homes in the Carnelian Bay community and Ca State Hwy 89. The fuels in this zone are made up of high surface fuel loading 35 tons per acre with an understory of brush and slash.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Twelfth

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

CF3 is located on the northern border of the Cedar Flat neighborhood.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

***Stream Environment Zones Prescription:** Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.*

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: *Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.*

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. Chips scattered throughout the project area will not exceed four inches in depth.*

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classification 2. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classification and SEZ. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area.

Mechanical operations are required for the cost effective completion of this project. Over the snow operations will not mitigate heavy surface fuels.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

*Defense Zone \$4,600 per acre
\$4,600.00 x 193 acres = \$ 887,800*

Total = \$ 887,800

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: North Tahoe

Name of Neighborhood: Carnelian Bay

Date: November 2004

Project Title: Carnelian Bay 1-CB1

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project area is a NFFL fuel model 10. A fire in the area would have a rate of spread of 300 feet per hour with flame lengths of 4 to 6 feet. The type of fire would be a high intensity surface fire due to heavy fuel loading on the surface and dense ladder fuels. A passive crown fire is likely. A southwest wind would move a wildfire quickly into the community*

***Tactical decision for Project:** Defense Zone was selected to protect homes in the community from a wildfire initiating in the community and burning thru the community. The fuels in this zone are made up of high surface fuel loading 35 tons per acre with an understory of brush and slash.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Nineteenth

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

CB1 is located on the western border of the Carnelian Bay neighborhood.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

This project area has been previously treated and will only require prescribed burning to maintain the effectiveness of the previous treatment.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

Prescribed Burning in Forests. 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 three inches dbh. Use fire to prune ladder fuels by scorching the lower 1/3 of branches on 100% of trees less than eight inches dbh. Retain large down logs (14 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:

- six foot maximum scorch height; and,
- less than 10% mortality in conifers > 12 inches dbh.

Do not ignite fires in stream environment zones (SEZs). 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 10-hour fuels (<1 inch diameter) should be consumed in SEZs.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including Bailey Land Classifications 2 and 3. The current proposed prescription of prescribed burning is in agreement with the operational constraints within Bailey Landuse Classifications. The Bailey Land Class should be ground verified to ensure they apply to the project area.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

*Defense Zone \$1,200 per acre
\$1,200 x 115 acres = \$ 138,000*

Total = \$ 138,000

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: North Tahoe

Name of Neighborhood: Carnelian Bay

Date: November 2004

Project Title: Carnelian Bay 2-CB2

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project area is a NFFL fuel model 10. A fire in the area would have a rate of spread of 300 feet per hour with flame lengths of 4 to 6 feet. The type of fire would be a high intensity surface fire due to heavy fuel loading on the surface and dense ladder fuels. A passive crown fire is likely. A southwest wind would move a wildfire quickly into the community.*

***Tactical decision for Project:** Defense Zone was selected to protect homes in the community from a wildfire initiating west of the community and burning through the community. The fuels in this zone are made up of high surface fuel loading 35 tons per acre with an understory of brush and slash*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Twentieth

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

CB2 is located in the northwestern portion of the Carnelian Bay neighborhood.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

Hand Piling and Burning. All cut material and dead and down material greater than 3 inches in diameter and up to 14 inches diameter shall be piled for burning. Piles shall be constructed compactly beginning with a core of fine fuels and minimizing air spaces to facilitate complete combustion. Piles will be constructed at least 1.5 times the diameter of the pile from residual trees and no taller than five feet to prevent damage when burning. If the area will not be broadcast burned, then each pile will be lined with a wet or hand fire line. At least one half of each pile will be covered with water resistant burnable paper to cover the fine material in the center of the piles.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including Bailey Land Classifications 1C and 2. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classifications. The Bailey Land Class should be ground verified to ensure they apply to the project area.

Mechanical operations are required for the cost effective completion of this project. Over the snow operations will not mitigate heavy surface fuels.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

*Defense Zone \$4,600 per acre
\$4,600 x 228 acres = \$ 1,048,800*

Total = \$ 1,048,800

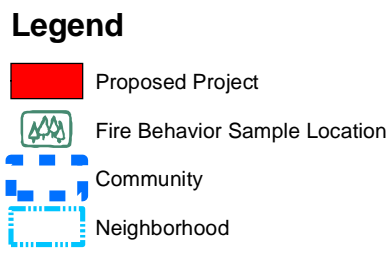
Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.





Geoarch Sciences has made every effort to accurately compile the information depicted this map, but cannot warrant the reliability or completeness of the source data.

Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: North Tahoe

Name of Neighborhood: Agate Bay

Date: November 2004

Project Title: Agate Bay 1-AB1

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project area is a NFFL fuel model 10. A fire in the area would have a rate of spread of 300 feet per hour with flame lengths of 4 to 6 feet. The type of fire would be a high intensity surface fire due to heavy fuel loading on the surface and dense ladder fuels. A passive crown fire is likely. A southwest wind would move a wildfire quickly into the community.*

***Tactical decision for Project:** The defense zone was selected to protect the community from a fire initiating on in Carnelian Bay and entering community. A southern wind would drive a fire into the community and prevent fire suppression resources from having a safe place to stop a fire.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Twenty third

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

AB1 is northwest of the Agate Bay neighborhood.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

***Stream Environment Zones Prescription:** Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.*

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

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. Chips scattered throughout the project area will not exceed four inches in depth.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classification 1C. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classification and SEZs. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area.

Mechanical operations are required for the cost effective completion of this project. Over the snow operations will not mitigate heavy surface fuels.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$2,500 per acre
\$2,500 x 82 acres = \$205,000

Total = \$205,000

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet

Fire District: North Tahoe

Name of Neighborhood: Tahoe Vista

Date: November 2004

Project Title: Tahoe Vista 1-TV1

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project area is a NFFL fuel model 10. A fire in the area would have a rate of spread of 300 feet per hour with flame lengths of 4 to 6 feet. The type of fire would be a high intensity surface fire due to heavy fuel loading on the surface and dense ladder fuels. A passive crown fire is likely. A southeast wind would move a wildfire quickly into the community*

***Tactical Decision for Project:** Defense Zone was selected to protect homes in the community from a wildfire initiating in the community or on the LTBMU property to the east and burning into the community. The fuels in this zone are made up of high surface fuel loading 35 tons per acre with an understory of brush and slash.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Fifteenth

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

TV1 is located in the southwest of the eastern portion Tahoe Vista neighborhood.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Slopes and access on existing roadways within the community allow for the use of mechanical equipment. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

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. Chips scattered throughout the project area will not exceed four inches in depth.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including Bailey Land Classifications 1A, 2 and 3. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classifications. The Bailey Land Class should be ground verified to ensure they apply to the project area.

Mechanical operations are required for the cost effective completion of this project. Over the snow operations will not mitigate heavy surface fuels.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$4,600 per acre
\$4,600 x 28 acres = \$ 128,800

Total = \$ 128,800

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: North Tahoe

Name of Neighborhood: Tahoe Vista

Date: November 2004

Project Title: Tahoe Vista 2-TV2

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project area is a NFFL fuel model 10. A fire in the area would have a rate of spread of 300 feet per hour with flame lengths of 4 to 6 feet. The type of fire would be a high intensity surface fire due to heavy fuel loading on the surface and dense ladder fuels. A passive crown fire is likely. A southeast wind would move a wildfire quickly into the community*

***Tactical Decision for Project:** Defense Zone was selected to protect homes in the community from a wildfire initiating in the community and burning through the community. The fuels in this zone are made up of high surface fuel loading with an understory of brush and slash*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Twenty first

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

TV2 is located in the western portion of the Tahoe Vista neighborhood.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Slopes and access on existing roadways within the community allow for the use of mechanical equipment. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

Mastication. Where mastication is recommended for projects proposed in this report, use rubber tired or low impact tracked vehicles to cut, chip, and scatter all shrubs and small trees up to 10" dbh on site. Brush cover should be reduced by creating a mosaic of treated and untreated shrubs. Brush that is treated should be cut to the maximum of six inches in height. No individual pieces of cut material shall be greater than 4 feet long. All masticated stumps shall be cut to within six inches of the ground. No debris shall average more than two inches over the entire project area. All cut vegetation will be kept within the unit boundaries. Any cut vegetation falling into ditches, roads, road banks, trails, or adjacent units shall immediately be removed.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including Bailey Land Classification 1A. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classification. The Bailey Land Class should be ground verified to ensure they apply to the project area.

Mechanical operations are required for the cost effective completion of this project. Over the snow operations will not mitigate heavy surface fuels.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

*Defense Zone \$4,600 per acre
\$4,600 x 29 acres = \$ 133,400*

Total = \$ 133,400

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: North Tahoe

Name of Neighborhood: Tahoe Vista

Date: November 2004

Project Title: Tahoe Vista 3-TV3

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project fire behavior:** The project area is a NFFL fuel model 10. A fire in the area would have a rate of spread of 300 feet per hour with flame lengths of 4 to 6 feet. The type of fire would be a high intensity surface fire due to heavy fuel loading on the surface and dense ladder fuels. A passive crown fire is likely. A southeast wind would move a wildfire quickly into the community*

***Tactical Decision for Project:** Defense Zone was selected to protect homes in the community from a wildfire initiating in the community or on the Forest Service property to the east and burning into the community. The fuels in this zone are made up of high surface fuel loading 35 tons per acre with an understory of brush and slash.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Twenty second

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

TV3 is located throughout the north central portion of the Tahoe Visa neighborhood.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

***Stream Environment Zones Prescription:** Dead and dying material and mature lodgepole will be reduced in all SEZ's. Riparian areas along perennial streams will be characterized by a mosaic of age classes and forms of deciduous vegetation. Mature lodgepole pines will widely scattered. Riparian areas along intermittent and ephemeral streams at lower elevations will be characterized by scattered shrubs. At higher elevations where adjacent uplands burned every 19-32 years, shrubs and trees less than 6 inches dbh should be common in riparian areas.*

Defense zones are generally constructed using a combination of the techniques and prescriptions. Where possible, mechanical thinning should be the preferred technique because it can achieve fuel hazard and forest health objectives. Mastication, hand thinning, and prescribed burning will achieve fuel hazard objectives; however, these techniques may not achieve forest health objectives.

Thinning: Thin stands from below by removing small trees up to 30 inches dbh. Where possible avoid removal of trees greater than 20 in dbh (TRPA Resolution 2004-15). Starting with the smallest diameter class, remove sufficient suppressed and intermediate trees to achieve the crown base height and tree spacing for a defense zone. Wherever possible, use mechanical thinning to achieve fuel hazard and forest health objectives. Hand thinning will be limited to removal of trees up to 14 inches dbh. Only use hand thinning where forest health is not an issue or regulatory constraints prohibit the use of mechanical equipment. Treat slash by whole tree yarding or disposing of slash in stands by hand piling and burning or chipping and scattering.

Mastication. Where mastication is recommended for projects proposed in this report, use rubber tired or low impact tracked vehicles to cut, chip, and scatter all shrubs and small trees up to 10" dbh on site. Brush cover should be reduced by creating a mosaic of treated and untreated shrubs. Brush that is treated should be cut to the maximum of six inches in height. No individual pieces of cut material shall be greater than 4 feet long. All masticated stumps shall be cut to within six inches of the ground. No debris shall average more than two inches over the entire project area. All cut vegetation will be kept within the unit boundaries. Any cut vegetation falling into ditches, roads, road banks, trails, or adjacent units shall immediately be removed.

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ and Bailey Land Classification 1A. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classification and SEZ's. The SEZ and Bailey Land Class should be ground verified to ensure they apply to the project area. Mechanical operations can avoid sensitive areas during project implementation, only a small portion of the project area contains sensitive areas.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Defense Zone \$2,500 per acre
\$2,500 x 56 acres = \$140,000

Total = \$140,000

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: North Tahoe

Name of Neighborhood: Tahoe Vista

Date: November 2004

Project Title: Tahoe Vista 4-TV4

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project fire behavior:** The project area is a NFFL fuel model 10. A fire in the area would have a rate of spread of 300 feet per hour with flame lengths of 4 to 6 feet. The type of fire would be a high intensity surface fire due to heavy fuel loading on the surface and dense ladder fuels. A passive crown fire is likely.*

***Tactical Decision for Project:** Urban Lot was selected to protect homes in the community from a wildfire initiating in the community and burning through the community. The fuels in this zone are made up of high surface fuel loading 35 tons per acre with an understory of brush and slash.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Sixteenth

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

TV4 is located in the southwest of the western portion of the Tahoe Vista neighborhood.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

Urban Lots

Fuels treatment on urban lots are generally conducted by hand thinning and designed to remove excessive fuels, thereby altering fire behavior and reducing the ability of a wildfire to move to neighboring lots. Trees spacing and ladder fuels will be the same as in the defense zone. Urban lots will have about 40% canopy cover and will be approximately 100-150 sq ft basal area.

Urban lot prescriptions are accomplished through a specific combination of thinning with either pile burning or chipping as the disposal method. Implementation of the prescriptions is unique given the proximity to structures and the relatively easy access to the forest stand. Though hand thinning has been the favored treatment technique, mechanical thinning and mastication with small machines should be evaluated as an alternative cost-effective method of treating urban fuels.

***Urban Lot Prescription.** Reduce the potential for crown fires by increasing the crown base height to at least 20 feet. Starting with the smallest diameter class and remove suppressed and intermediate trees to achieve the prescribed crown base height. Remove ground fuels greater than three inches diameter and treat shrub densities to achieve flame lengths of no more than two feet.*

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within SEZ's. The SEZ should be ground verified to ensure they apply to the project area. Mechanical operations can stay existing roads and trails to limit impact to the sensitive area.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

*Urban Lot \$4,075 per acre
\$4,075 x 117 acres = \$476,775*

Total = \$476,775

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: North Tahoe

Name of Neighborhood: Tahoe Vista

Date: November 2004

Project Title: Tahoe Vista 5-TV5

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project area is a NFFL fuel model 10. A fire in the area would have a rate of spread of 300 feet per hour with flame lengths of 3 to 5 feet in moist drainages. The type of fire would be a high intensity surface fire due to heavy fuel loading on the surface and dense ladder fuels. A passive crown fire is likely. Some areas are represented by NFFL Fuel Model 5. In the brush a fire would burn with a rate of spread of 840 of feet per hour, and flame lengths less than 3 feet.*

***Tactical decision for Project:** Urban Lots treatment was selected to protect homes from a fire that initiates in the community and spreads through the community via the fuels in the open areas. The project also provides protection inside the community from spotting fire brands from a fire outside the community. The projects are located in common areas inside the community. This project addresses concerns expressed by the Kingswood Residents Association regarding fuel loadings in their community. They have expressed an interest in having these areas identified.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Eighteenth

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

TV5 is located in the northwestern portion of the Tahoe Vista neighborhood.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

Urban Lots

Fuels treatment on urban lots are generally conducted by hand thinning and designed to remove excessive fuels, thereby altering fire behavior and reducing the ability of a wildfire to move to neighboring lots. Trees spacing and ladder fuels will be the same as in the defense zone. Urban lots will have about 40% canopy cover and will be approximately 100-150 sq ft basal area.

Urban lot prescriptions are accomplished through a specific combination of thinning with either pile burning or chipping as the disposal method. Implementation of the prescriptions is unique given the proximity to structures and the relatively easy access to the forest stand. Though hand thinning has been the favored treatment technique, mechanical thinning and mastication with small machines should be evaluated as an alternative cost-effective method of treating urban fuels.

***Urban Lot Prescription.** Reduce the potential for crown fires by increasing the crown base height to at least 20 feet. Starting with the smallest diameter class and remove suppressed and intermediate trees to achieve the prescribed crown base height. Remove ground fuels greater than three inches diameter and treat shrub densities to achieve flame lengths of no more than two feet.*

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a SEZ. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within SEZ's. The SEZ should be ground verified to ensure they apply to the project area. Mechanical operations can stay existing roads and trails to limit impact to the sensitive area.

TRPA and Lahontan require buffers for forestry activities near SEZs. Tree removal may be allowed within stream corridors and other SEZs under certain conditions if it is demonstrated that removal of the vegetation will benefit the SEZ vegetative community. Lodgepole removal generally falls into this category. Contact these agencies to discuss treatment options within SEZs.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

*Urban Lot \$4,075 per acre
\$4,075 x 13 acres = \$52,975*

Total = \$52,975

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.





Legend

- Proposed Project
- Fire Behavior Sample Location
- Community
- Neighborhood

Figure 31.
Proposed Projects Kings Beach

0 0.1 0.2 0.3 0.4 0.5 Miles



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: North Tahoe

Name of Neighborhood: Kings Beach

Date: November 2004

Project Title: Kings Beach 1-KB1

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project is in an NFFL fuel Model 5, of brush. A fire in this area would have a rate of spread of 1465-2052 feet per hour with flame lengths of 5-10 feet in very steep terrain. Southerly winds would make suppression difficult. The poor road infrastructure makes evacuation difficult.*

***Tactical decision for Project:** Defense Zone was selected to protect homes in the community from a wildfire initiating in the community or on the LTBMU property to the east and burning into the community. The fuels in this zone are made up of high surface fuel loading 35 tons per acre with an understory of brush and slash.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Second

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

KB1 is located in the western border of the Kings Beach neighborhood.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Forest Stand Prescription:** Forest stands are dominated by larger fire tolerant trees and surface and ladder fuels are reduced so crown fire ignitions are unlikely. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. On drier sights, white fir should have a higher priority of removal than other species.*

Forest health would be improved by reducing tree stocking to approximately 90-150 feet² per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by maintaining be 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible.

***Brush Prescription:** Brush fields within defense zones will not carry surface fires with flames lengths longer than 3 feet. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

Mastication. *Where mastication is recommended for projects proposed in this report, use rubber tired or low impact tracked vehicles to cut, chip, and scatter all shrubs and small trees up to 10" dbh on site. Brush cover should be reduced by creating a mosaic of treated and untreated shrubs. Brush that is treated should be cut to the maximum of six inches in height. No individual pieces of cut material shall be greater than 4 feet long. All masticated stumps shall be cut to within six inches of the ground. No debris shall average more than two inches over the entire project area. All cut vegetation will be kept within the unit boundaries. Any cut vegetation falling into ditches, roads, road banks, trails, or adjacent units shall immediately be removed.*

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including Bailey Land Classifications 1A and 3. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classifications. The Bailey Land Class should be ground verified to ensure they apply to the project area.

Mechanical operations are required for the cost effective completion of this project. Over the snow operations will not mitigate heavy surface fuels.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

*Defense Zone \$2,500 per acre
\$2,500 x 69 acres = \$172,500*

Total = \$172,500

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: North Tahoe

Name of Neighborhood: Kings Beach

Date: November 2004

Project Title: Kings Beach 2-KB2

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project is in an NFFL fuel Model 5, of brush. A fire in this area would have a rate of spread of 840 feet per hour with flame lengths of 5 feet in very steep terrain. Southerly winds would make suppression difficult. The poor road infrastructure makes evacuation difficult.*

***Tactical decision for Project:** Defense Zone will reduce fuels below Hwy 28 in the common area for Brockway Estates. The project is necessary to protect evacuation routes out of the community and on CA State Hwy 28.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Seventeen

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

KB2 is located in the southern portion of the Kings Beach neighborhood.

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

Urban Lots

Fuels treatment on urban lots are generally conducted by hand thinning and designed to remove excessive fuels, thereby altering fire behavior and reducing the ability of a wildfire to move to neighboring lots. Trees spacing and ladder fuels will be the same as in the defense zone. Urban lots will have about 40% canopy cover and will be approximately 100-150 sq ft basal area.

Urban lot prescriptions are accomplished through a specific combination of thinning with either pile burning or chipping as the disposal method. Implementation of the prescriptions is unique given the proximity to structures and the relatively easy access to the forest stand. Though hand thinning has been the favored treatment technique, mechanical thinning and mastication with small machines should be evaluated as an alternative cost-effective method of treating urban fuels.

***Urban Lot Prescription.** Reduce the potential for crown fires by increasing the crown base height to at least 20 feet. Starting with the smallest diameter class and remove suppressed and intermediate trees to achieve the prescribed crown base height. Remove ground fuels greater than three inches diameter and treat shrub densities to achieve flame lengths of no more than two feet.*

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including Bailey Land Classification 1A. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classification. The Bailey Land Class should be ground verified to ensure they apply to the project area.

Mechanical operations are required for the cost effective completion of this project. Over the snow operations will not mitigate heavy surface fuels.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

*Urban Lot \$4,075 per acre
\$4,075 x10 acres = \$40,750*

Total = \$40,750

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.



Risk/Hazard Identification and Mitigation Project Worksheet
(Complete one worksheet for each mitigation project proposed)

Fire District: North Tahoe

Name of Community: North Tahoe

Date: November 2004

Project Title: Community Defensible Space Program

Description of Risk/Hazard: Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** Numerous private lots within the NTFPD contain hazardous wildland fuels. These fuels pose a hazard to structures located on the lots or adjacent lots. Significant structure loss will result from the proximity of wildland fuels during a wildfire event.*

***Tactical decision for Project:** The NTFPD would like to provide landowners assistance in establishing effective defensible space around structures.*

Priority Ranking: What is the priority ranking of this risk/hazard in relation to all others identified?

Location: Describe or attach a map with sufficient detail to allow accurate ground location.

All private land lots less than 2 acres within the North Tahoe Fire Protection District

Recommended Mitigation Measures and Scope of Work: Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

Urban Lots

Fuels treatment on urban lots are generally conducted by hand thinning and designed to remove excessive fuels, thereby altering fire behavior and reducing the ability of a wildfire to move to neighboring lots. Ground fuels should be reduced such that ground fire flame heights would be less than 2 feet. There would be at least 10 feet between the crowns or 20 feet between boles of trees with an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet. This tree spacing will make crown fires in the overstory unlikely and increasing the crown base height reduces ladder fuels. Urban lots will have about 40% canopy cover and will be approximately 110 to 150 sq ft basal area. On steep slopes, tree spacing may be increased. The Living with Fire in the Tahoe Basin guidelines should be used in creating effective defensible space.

Urban lot prescriptions are accomplished through a specific combination of thinning with either pile burning or chipping as the disposal method. Implementation of the prescriptions is unique given the proximity to structures and the relatively easy access to the forest stand. Though hand thinning has been the favored treatment technique, mechanical thinning and mastication with small machines should be evaluated as an alternative cost-effective method of treating urban fuels.

***Urban Lot Prescription.** Reduce the potential for crown fires by increasing the crown base height to at least 20 feet. Starting with the smallest diameter class and remove suppressed and intermediate trees to achieve the prescribed crown base height and tree spacing. Remove ground fuels greater than three inches diameter and treat shrub densities to achieve flame lengths of no more than two feet. Dispose of biomass material through chipping.*

Identification of Protected Species or Other Critical Resources: Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

The project contains sensitive areas, including a Bailey Land Classifications 1A. The current proposed prescription of mechanical treatment is in conflict with the operational constraints within Bailey Landuse Classifications. The Bailey Land Class should be ground verified to ensure they apply to the project area.

Mechanical equipment can be limited to the roadway, with hand crews pulling material to the edge of the road for disposal.

Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.

With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.

Estimated Cost: Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

Community Defensible Space \$2,500 per acre
\$2,500 x 2298 acres = \$5,746,000 **Total = \$5,746,000**

Project Maintenance Requirements:

Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated by hand or with mechanical means every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.

Other Considerations: Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

All proposed projects must comply with federal, state, and regional environmental regulations. Projects on federal land or on other lands with federal funding must comply with the National Environmental Policy Act. The Healthy Forest Restoration Act provides for a focused analysis of environmental impacts. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with the TRPA's requirements and a waste discharge waiver from the Lahontan Regional Water Quality Control Board.

IV. APPENDICES

A. References

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Appendix B: Glossary

Active crown fire—A **crown fire** in which the entire **fuel complex** becomes involved, but the crowning phase remains dependent on heat released from the **surface fuels** for continued spread. Also called **running** and **continuous crown fire**.

Available canopy fuel—The mass of **canopy fuel** per unit area consumed in a crown fire. There is no post-frontal combustion in canopy fuels, so only fine canopy fuels are consumed. We assume that only the foliage and a small fraction of the branch wood is available.

Available fuel—The total mass of ground, surface and canopy fuel per unit area consumed by a fire, including fuels consumed in postfrontal combustion of duff, organic soils, and large woody fuels.

Canopy base height—The lowest height above the ground at which there is a sufficient amount of **canopy fuel** to propagate fire vertically into the canopy. Canopy base height is an effective value that incorporates ladder fuels such as shrubs and understory trees. See also **fuel strata gap** and **crown base height**.

Canopy bulk density—The mass of **available canopy fuel** per unit canopy volume. It is a bulk property of a stand, not an individual tree.

Canopy fuels—The live and dead foliage, live and dead branches, and lichen of trees and tall shrubs that lie above the **surface fuels**. See also **available canopy fuel**.

Conditional surface fire—A potential type of fire in which conditions for sustained active crown fire spread are met but conditions for crown fire initiation are not. If the fire begins as a surface fire then it is expected to remain so. If it begins as an **active crown fire** in an adjacent stand, then it may continue to spread as an active crown fire.

Continuous crown fire—See **active crown fire**.

Crown base height—The vertical distance from the ground to the bottom of the live crown of an individual tree. See also **canopy base height**.

Crown bulk density—The mass of available fuel per unit crown volume. In this paper it is a property of an individual tree, not a whole stand. See also **canopy bulk density**.

Crown fire—Any fire that burns in **canopy fuels**.

Crown fire cessation—The process by which a **crown fire** ceases, resulting in a **surface fire**.

Crown fire hazard—A physical situation (fuels, weather, and topography) with potential for causing harm or damage as a result of crown fire.

Crowning Index—The open (6.1-m) windspeed at which **active crown fire** is possible for the specified **fire environment**.

Environmental conditions—That part of the **fire environment** that undergoes short term changes: weather, which is most commonly manifest as windspeed and dead fuel moisture content.

Fire environment—The characteristics of a site that influence fire behavior. In fire modeling the fire environment is described by surface and canopy fuel characteristics, windspeed and direction, relative humidity, and slope steepness.

Fire hazard—A physical situation (fuels, weather, and topography) with potential for causing harm or damage as a result of wildland fire.

Fire intensity—See **frontal fire intensity**. Contrast with **fireline intensity**.

Fireline intensity—The rate of heat release in the **flaming front** per unit length of fire front (Byram 1959).

Flaming front—The zone at a fire's edge where solid flame is maintained.

Foliar moisture content—Moisture content (dry weight basis) of live foliage, expressed as a percent. Effective foliar moisture content incorporates the moisture content of other canopy fuels such as lichen, dead foliage, and live and dead branch wood.

Foliar moisture effect—A theoretical effect of **foliar moisture content** on active crown fire spread rate (Van Wagner 1974, 1979, 1983).

Frontal fire intensity—Similar to **fireline intensity**, it is the rate of heat release per unit length of fire front, including the additional heat released from postfrontal flaming and smoldering combustion (Forestry Canada Fire Danger Group 1992).

Fuel complex—The combination of ground, surface, and canopy fuel strata.

Fuel model—A set of surface fuel bed characteristics (load and surface-area-to volume-ratio by size class, heat content, and depth) organized for input to a fire model. Standard fuel models (Anderson 1982) have been stylized to represent specific fuel conditions.

Fuel strata gap—The vertical distance between the top of the **surface fuel** stratum and the bottom of the **canopy fuel** stratum.

Fuel stratum—A horizontal layer of fuels of similar general characteristics. We generally recognize three fuel strata: ground, surface, and canopy.

Full-range fire behavior simulation—The simulated behavior of a wildland fire whether it is a surface fire, passive crown fire, or active crown fire. Ground fire behavior is usually not included.

Ground fire—A slow-burning, smoldering fire in **ground fuels**. Contrast with **surface fire**.

Ground fuels—Fuels that lie beneath surface fuels, such as organic soils, duff, decomposing litter, buried logs, roots, and the below-surface portion of stumps. Compare with **surface fuels**.

Independent crown fire—A **crown fire** that spreads without the aid of a supporting **surface fire**.

Intermittent crown fire—A **crown fire** that alternates in space and time between active crowning and surface fire or passive crowning. See also **passive crown fire**.

Passive crown fire—A crown fire in which individual or small groups of trees torch out, but solid flaming in the canopy cannot be maintained except for short periods. Passive crown fire encompasses a wide range of crown fire behavior from the occasional torching of an isolated tree to a nearly active crown fire. Also called torching and candling. See also **intermittent crown fire**.

Plume-dominated fire—A fire for which the power of the fire exceeds the power of the wind, leading to a tall convection column and atypical spread patterns. The models used in this paper do not address plume-dominated fire behavior. Contrast with **wind-driven fire**.

Running crown fire—See **active crown fire**.

Site characteristics—The characteristics of a location that do not change with time slope, aspect, elevation.

Surface fire—A fire spreading through **surface fuels**.

Surface fuels—Needles, leaves, grass, forbs, dead and down branches and boles, stumps, shrubs, and short trees.

Torching Index—The open (6.1-m) windspeed at which crown fire activity can initiate for the specified **fire environment**.

Total biomass—The mass per unit area of all living and dead vegetation at a site.

Total fuel load—The mass of fuel per unit area that could possibly be consumed in a hypothetical fire of the highest intensity in the driest fuels.

Wind-driven fire—A wildland fire in which the power of the wind exceeds the power of the fire, characterized by a bent-over smoke plume and a high length-to width ratio.

Wind reduction factor—The ratio of the midflame windspeed to the open (6.1-m) windspeed. For convenience of measurement eye-level winds are usually substituted for midflame winds.

C. FALLEN LEAF FIRE DEPARTMENT SUPPORTING DOCUMENTATION

D. LAKE VALLEY FIRE PROTECTION DISTRICT SUPPORTING DOCUMENTATION

E. MEEKS BAY FIRE PROTECTION DISTRICT SUPPORTING DOCUMENTATION

EMERALD BAY SUMMER HOME TRACT

EVACUATION PLAN



PREPARED BY: David D. Brown, Eldorado Environmental Consultants
14 July, 2004

EMERALD BAY TRACT EVACUATION PLAN

I. PURPOSE

The evacuation plan for the Emerald Bay Tract is necessary due to the threat of wildfire and potential loss of life and property. The plan is not meant to alarm residents of the tract, but to make the residents aware that an orderly evacuation in the event of a wildfire will provide for safety of the residents, safety of the firefighters and reduction in the possible loss of property.

II. SITUATION

The Upper and Lower Emerald Bay Summer Home Tracts (referred to as the Emerald Bay Tract or the tract) are located within the Lake Tahoe Basin Management Unit of the National Forest System, El Dorado County, California. The tracts are located on National Forest Land and exist as private, summer home sites via Forest Service permits (T13N, R17E, N½ Sec. 21). The area is characterized by steep slopes in the lower mixed conifer zone. The major plant associations are 1) ponderosa pine, Jeffrey pine, white fir, incense cedar and sugar pine; 2) manzanita/scrub oak; 3) willow/alder in the wetter zones.

Wildfires are a natural element of the western forests and at times, may pose a threat to the Emerald Bay Tract. Evacuation of the tract will save lives and property when done early and in an orderly manner. In an emergency situation confusion and misdirection will result without planning and ultimately, direction from trained personnel. NOTE: The tract is located in a high risk avalanche and land slide area. The avalanche risk is evidenced by the avalanche chutes between the Upper and Lower Tracts and between the Lower Tract and Bliss State Park. The land slide risk is evidenced by the slide area on the SW corner of Emerald Bay. The risk is minimal to humans due to the seasonal use of the tracts, and is mentioned here only to demonstrate that natural disasters besides wildfires could occur.

Populated areas in the direct path of a wildfire will be evacuated. Early warning is essential. Most people will leave the area when notified, but some will refuse to leave their homes or the area. Evacuees in most situations will have little time to prepare and will require support at the evacuation "reception area." Evacuees must be directed to the reception area deemed safest.

Two potential fire-related situations may occur in or near the tracts. The first situation involves a large wildfire, which may pose imminent threat to the tracts. This situation normally will offer sufficient time to plan an orderly evacuation if one should become necessary. The second situation involves a structure fire at one of the cabins, which may pose a threat of spreading to the wildland and eventually to other cabins. This situation normally will not offer sufficient time to plan an orderly evacuation.

The first situation will utilize the process outlined in the Implementation Plan where an

evacuation warning will precede an evacuation request or order. The second situation will call for the initial attack incident commander (from Meeks Bay Fire Protection District, or USDA FS) to order an evacuation request or order if deemed necessary. (See Evacuation Implementation Plan)

III. OPERATION

The El Dorado County Sheriff will normally order the evacuation due to a wildfire. If rapid evacuation is critical to the health and safety of the tract residents, the on-scene incident commander may order the evacuation. This situation may occur in the event of a structure fire in the tract which is in danger of spreading to the wildland and surrounding structures.

The movement of the evacuees will be in private vehicles. Evacuation routes to the evacuation reception area will be selected by the Sheriff (or other on-scene law enforcement official). Traffic on the access roads to the tracts is one way with some possibility of pull outs. REMEMBER, EMERGENCY EQUIPMENT HAS THE RIGHT-OF-WAY! Traffic control points may be located in the area as traffic volume and complexity of the evacuation routes increase.

IV. TRAFFIC CONTROL

The initial rush to evacuate the tracts may cause severe congestion, especially in the Vikingsholm and Eagle Falls areas. Those that are severely threatened should be moved first. Then those that are less severely threatened next.

The Resident Evacuation Coordinator, Al Phelps from the Upper Tract and Charlie Kellermeyer from the Lower Tract, will inform the residents of the need and reason for the order of evacuation. Al Phelps has kindly agreed to act as the Coordinator for the Upper Tract since he and Pat are in residence during most of the high use season (May - October). Charlie Kellermeyer has also kindly agreed to act as the Coordinator for the Lower Tract since he and Janie are in residence virtually year long.

V. RECEPTION AREAS

Reception areas serve two purposes. First to communicate a safe route to a safe harbor, and second, to ensure all evacuees from the tract have made it to safety. The reception area will have a manager (Al Phelps and/or Charlie Kellermeyer). The manager will account for the evacuees from the tracts.

Reception areas are necessary both north and south of the tracts. E.G., If wildfire is threatening from the south, then the evacuation route and reception area will be north.

NORTH RECEPTION AREA: HOMEWOOD SKI AREA PARKING LOT AT NORTH END OF HOMEWOOD

SOUTH RECEPTION AREA: CAMP RICHARDSON HOTEL/STORE PARKING LOT

Alternate reception areas may be designated by local law enforcement as need dictates.

VI. PREPLANNING

Extreme fire conditions in the area will cause extreme fire behavior including long flame lengths, crown fires and long-range spotting of up to a half mile. Fire behavior should be considered when ordering an evacuation. The order to evacuate should be given as early as possible. Early evacuation of the tracts will allow quick access to the tracts by fire suppression forces. This will provide time to pretreat the structures in the path of the wildfire. The structure pretreatment may consist of hazard reduction around structures and the use of foam to coat the structures. This activity will increase the survivability of many structures. NOTE: The existence of an existing defensible space, according to California Law and the enclosed publication, will significantly increase survivability of the structure.

Due to fuel loading in the area, in particular the Lower Tract, safety of the residents and survivability of the structures will improve with a quick, efficient evacuation and pretreatment of the structures. Fire suppression forces can move out of the area when the fire front moves into the area, and then return after it passes. This maximizes the safety of the firefighters and still gives a high success rate in the structure protection effort.

VII. PLAN IMPLEMENTATION

The evacuation must be implemented quickly and in an orderly manner when the evacuation order is given. The attached implementation plan must be followed to provide for the safety of the residents and the responding fire suppression forces.

Informed residents and authorities will provide for an orderly and timely evacuation when/if required. The evacuation plan has been distributed to all cabin owners in the Emerald Bay Summer Home Tracts, the El Dorado County Sheriff, the USDA Forest Service and the Meeks Bay Fire Department. The attached list(s) are specific (Contact List, Upper Tract, Lower Tract).

EMERALD BAY TRACT EVACUATION IMPLEMENTATION PLAN

I. EVACUATION STAGES

The El Dorado County Sheriff (referred to as the local authority) will normally issue an Evacuation Order in response to natural disasters. An Incident Commander (referred to as the IC), as an agent for the USDA Forest Service or Meeks Bay Fire Protection District can issue orders for evacuation in the event of a wildfire or structure fire threatening the Emerald Bay Tract.

The IC may order the evacuation if immediate evacuation of the tract is critical and necessary for the health and safety of the residents. Consultation will be done with the local authority as soon as possible.

A. Pre-evacuation Notice

1. Contacts and briefing of persons within the affected area will be done when it is determined that a wildfire with potential threat to structures occurs in the Emerald Bay area.
2. The methods used to inform the residents of the Emerald Bay Tract of the fire conditions will be telephone and personal contacts.

B. Evacuation Warning

1. An evacuation warning is given when there is a high probability of the need to evacuate the Emerald Bay Tract.
2. Priority will be given to previously identified Emerald Bay Tract residents who require special care or assistance.
3. The methods used to inform the residents of the warning are the same as in item A, #2 above.

C. Evacuation Request

1. Occupants of the area will be asked to leave within a specified time period by a predesignated route and report to an evacuation reception center (Homewood or Camp Richardson as specified earlier).
2. Perimeter roadblocks will probably be established in the area. Appropriate law enforcement agencies will provide traffic control. Fire emergency personnel may have to provide traffic control in the absence of law enforcement personnel.

C. Evacuation Request (con't)

3. The methods used to inform the residents of the request are the same as in item A, #2 above.

D. Evacuation Order

1. The evacuation order will be given when it is determined by the IC in consultation with the local authority that the health and safety of the Emerald Bay Tract residents are at critical risk.
2. A Disaster Declaration or Emergency Proclamation will be issued and authority granted for the evacuation order by the local authority in consultation with the IC.
3. Access to the area is prohibited to anyone not authorized by the local authority or IC.
4. The evacuation order should be followed by all residents. The evacuation order will be enforced at the Emerald Bay Tract by the local authority or his agent.
5. An evacuation reception center usually will not be long term, but will be managed only until all residents check in with the reception center manager.

II. RESPONSIBILITIES

A. EL DORADO COUNTY SHERIFF: The El Dorado County Sheriff will normally issue an Evacuation Order in response to natural disasters. The evacuation order will be given when it is determined by the Incident Commander, in consultation with the local authority, that the health and safety of the Emerald Bay Tract residents are at critical risk.

1. The evacuation order will be enforced by the El Dorado County Sheriff or his agent.
2. The perimeter road blocks will be maintained and the evacuated areas patrolled by the El Dorado County Sheriff or his agent as safety conditions and staffing permit.

B. INCIDENT COMMANDER: An Incident Commander, as an agent for the USDA Forest Service or Meeks Bay Fire Protection District, can issue orders for evacuation. The IC may order the evacuation if immediate evacuation of the tract is critical and necessary for the health and safety of the residents.

B. INCIDENT COMMANDER (con't)

1. Maintain close coordination with the local authority of El Dorado County.
2. Request a liaison officer from the local authority.
3. Present the evacuation information and request to the local authority.
4. Order an emergency evacuation if health and safety of the Emerald Bay Tract residents is immediately threatened.

C. INCIDENT INFORMATION OFFICER:

1. Disseminate the evacuation order in coordination with the local authority.
2. Provide timely and accurate information to the media and evacuees.
3. Schedule town hall meetings as requested.

D. PLANNING SECTION CHIEF:

1. Develop, publish and distribute the Structure Protection Plan. Copies should be made available to the Operations Section Chief, the IC, the Structure Protection Specialist, the structure protection group supervisor and all individual resources assigned to the group.
2. Maintain documentation of forms and film related to structure protection.

E. OPERATIONS SECTION CHIEF:

1. Determine the area threatened by the fire.
2. Request resources for protection of the threatened area.
3. Provide input into the Structure Protection Plan in regards to resource assignments, strategy and tactics.

F. EMERALD BAY TRACT RESIDENT EVACUATION COORDINATOR AND RECEPTION AREA MANAGER: The Evacuation Coordinators will notify residents by phone using a resident phone list. The coordinators will advise residents of the travel route and that the road will be used as a one-way, out-only road (tract access roads). The coordinators will advise residents to report to the Evacuation Reception Center in either

F. RESIDENT EVACUATION COORDINATOR (con't)

Homewood or Camp Richardson. The coordinators will also act as reception area managers. The managers will account for the evacuees from the tract. Another reception area manager may be named by the local authority if the evacuation center will be long term. In this event, the coordinators will inform the manager of evacuee status.

CONTACT LIST:

18 September 1997

- | | |
|--|--|
| 1. El Dorado County Sheriff's Office | Sgt. Don Atkinson, Search & Rescue
Coordinator or Duty Officer
1360 Johnson Blvd. Suite 100
So. Lake Tahoe, CA 96150
(530)573-3000 |
| 2. USDA Forest Service
Lake Tahoe Basin Management Unit | Fire Management Officer
Kit Bailey, FMO
35 College Drive
South Lake Tahoe, CA 96150
(530)543-2631 |
| 3. Meeks Bay Fire Protection District | John B. Pang, Chief
PO Box 189
Tahoma, CA 96142
(530)525-7548 |
| 4. Emerald Bay Upper Tract
Evacuation Coordinator | Al Phelps, Cabin #8
PO Box 219
Tahoma, CA 96150
(530)544-8217 |
| Emerald Bay Lower Tract
Evacuation Coordinator | Charlie Kellermeyer, Cabin #18
PO Box 2246
Olympic Village, CA 96146
(530)542-2419 |
| 5. Emergency Calls | 911 |

EMERALD BAY TRACT STRUCTURE ANALYSIS

The initial structure analysis and size-up includes information on construction materials, roof material, deck materials, eave construction and width, placement of firewood piles, electrical shut-off location and gas/propane location and distance from structure. The analysis is divided into two parts, the first part is the Upper Tract and the second part is the Lower Tract. The data were collected in the fall of 1997, and are listed by cabin number. To cross reference cabin number to owner, refer to the owner listings.

UPPER TRACT: The cabins are listed in order, road entrance to road end, per USDA FS tract plat.

Cabin #1	Construction Material: Wood Roof Material: Wood Shingle Deck Material: Wood/Open Eaves: Open/6" Width Firewood Pile: None Observed Electric: North Side Gas/Propane: None
Cabin #2	Construction Material: Wood Roof Material: Wood Shingle Deck Material: No Deck Eaves: Open/1' Width Firewood Pile: None Observed Electric: Extension from Cabin #1 Gas/Propane: None
Cabin #3	Construction Material: Wood Roof Material: Composition Shingle Deck Material: Wood/Closed Eaves: Open/1' Width Firewood Pile: Adjacent to structure Electric: Northeast Corner Gas/Propane: None
Cabin #4	Construction Material: Wood Roof Material: Composition Shingle Deck Material: Wood/Closed (Brush <5' from Deck) Eaves: Open/1' Width Firewood Pile: None Observed Electric: Northeast Corner Gas/Propane: None

UPPER TRACT: (Con't)

Cabin #5	Construction Material: Wood Roof Material: Wood Shingle Deck Material: Wood/Open (<5' tall) Brush up to deck on east side Eaves: Open/<1' Width Firewood Pile: None Observed Electric: East Side Gas/Propane: None
Cabin #15	Construction Material: Wood Roof Material: Wood Shingle Deck Material: Wood/Open Eaves: Open/<1' Width Firewood Pile: <3' from structure Electric: West Side Gas/Propane: None
Cabin #14	Construction Material: Wood Roof Material: Composition Shingle Deck Material: Wood/Open Eaves: Open/ 18" Width Firewood Pile: 24' from structure Electric: West Side Gas/Propane: None
Cabin #13	Construction Material: Wood Roof Material: Composition Shingle Deck Material: Wood/Open Eaves: Open/1' Width Firewood Pile: 5' from structure in small box Electric: East Side Gas/Propane: None
Cabin #12	Construction Material: Wood Roof Material: Wood Shingle Deck Material: Wood/Open Eaves: Open/18" Width Firewood Pile: None Observed Electric: West Side Gas/Propane: None

UPPER TRACT: (Con't)

Cabin #6	Construction Material: Wood Roof Material: Propanel Deck Material: Wood/Closed on West, Open on East Eaves: Open/1' Width Firewood Pile: West 20', East 30' from structure Electric: North Side Gas/Propane: None
Cabin #7	Construction Material: Wood Roof Material: Composition Shingle Deck Material: Wood/Closed Eaves: Open/1' Width Firewood Pile: 15' from structure Electric: North Side Gas/Propane: None
Cabin #8	Construction Material: Wood Roof Material: Wood Shingle Deck Material: Wood/Closed Eaves: Open/<1' Width Firewood Pile: 15' from structure Electric: Northwest Corner Gas/Propane: None
Cabin #9	Construction Material: Wood (Metal window coverings on most) Roof Material: Wood Shingle Deck Material: Wood/Closed Eaves: Open/1' Width Firewood Pile: 40' from structure Electric: Northeast Corner Gas/Propane: None

GENERAL OBSERVATIONS: Small perennial stream w/culvert 96' E (toward Hwy. 89) of first driveway. A possible tee turnaround (24' deep x 16' wide) 48' E of first driveway.

*** **NOTE:** Ten thousand gallons (10,000 gal.) of water are available for fire suppression use. The hydrant is on the north side of the Upper Tract Road, 20' from the roadside, 60' east of the driveway for Cabin #1. It is 2½ inch National Standard. The tanks are just north of the hydrant. The valve to charge water to the hydrant is at the water tanks.

LOWER TRACT: The cabins are listed in order, road entrance to road end per USDA FS tract plat. To cross-reference cabin numbers with cabin owners, refer to the owners listings.

Cabin #16	Construction Material: Wood Roof Material: Composition Shingle Deck Material: Wood - West enclosed with door, East open Eaves: Open/1' Width Firewood Pile: 5' West, 2' North Electric: North Side, Shut-off in Cabin Gas/Propane: Propane Tank, 23' West
Cabin #17	Construction Material: Wood Roof Material: Wood Shingle Deck Material: Wood/Open Eaves: Open/1' Width Firewood Pile: 12' West Electric: South Side Gas/Propane: None
Cabin #18	Construction Material: Wood Roof Material: Wood Shingle Deck Material: Wood/Open Eaves: Open/1' Width Firewood Pile: 15' West Electric: West Side Gas/Propane: Propane Tank 15' West
Cabin #19	Construction Material: Wood Roof Material: Wood Shingle Deck Material: Wood/Open Eaves: Open/<1' Width Firewood Pile: 6' South Electric: Meter on Power Pole 40' W, Underground to Cabin, Shut-off in Cabin Gas/Propane: Propane Tank 32' South
Cabin #20	Construction Material: Wood Roof Material: Wood Shake Deck Material: Wood/Open Eaves: Open/1' Width Firewood Pile: 13' North, 8' South Electric: Meter on North, Shut-off in Cabin Gas/Propane: Propane Tank 38' West

LOWER TRACT (Con't):

Cabin #21	Construction Material: Wood Roof Material: Metal Deck Material: Wood/Open Eaves: Open/1' Width Firewood Pile: 25' South Electric: West Side Gas/Propane: None
Cabin #22	Construction Material: Wood Roof Material: Wood Shingle Deck Material: Wood/Open Eaves: Open/1' Width Firewood Pile: 25' South Electric: West Side Gas/Propane: None
Cabin #23	Construction Material: Wood Roof Material: Wood Shingle Deck Material: Wood/Open Eaves: Open/1' Width Firewood Pile: Lumber under deck Electric: Meter on South, Shut-off in Cabin Gas/Propane: None
Cabin #24	Construction Material: Wood Roof Material: Wood Shake Deck Material: Wood/Open Eaves: Open/1' Width Firewood Pile: 4' West, 2' West Electric: Meter in cubby hole NW Corner, Shut-off in Cabin Gas/Propane: None

UPPER EMERALD BAY CABIN OWNERS

Cabin #1	Bolling, Dick & Marjorie 594 Magdalena Ave. Los Altos, CA 94024	Home: (916)443-1336 Business: (916)369-0777 Tahoe: (530)544-8152
Cabin #2	Bob & Caroline Bredsteen 909 Capitola Ave. Capitola, CA 95010	Home: (831)462-5492 Business: (408)476-1550
Cabin #3	Jan & Lynette Whitemyer 76-371 Sweet Pea Way Palm Desert, CA 92211	Home: (760)345-8403 Tahoe: (530)544-1872
Cabin #4	Francis & Mary Lohse 1008 Cleveland St. Woodland, CA 95695	Home: (916)662-8532 Tahoe: (530)542-2669
	Cynthia & Jerry Stiles 219 Gibson Rd. Woodland, CA 95695	Home: (530)662-5944
Cabin #5	Bill & Jan Truitt 4200 Radcliffe Place Court Wildwood, MO 63025	Home: (314)938-5768 Tahoe: (530)544-5870
Cabin #6	Ralph & Pat Pendleton 10509 Mill Station Rd. Sebastopol, CA 95472	Home: (707)823-9065 Tahoe: (530)541-6492
Cabin #7	Jeff & Pam Plant 2545 East 3210 South Salt Lake City, UT 84109	Home: (801)466-5527 Tahoe: (530)544-8990
Cabin #8	Al & Pat Phelps 30-060 Noble Canyon Dr. Palm Desert, CA 92260	Home: (760)568-4516 Tahoe: (530)544-8217
Cabin #9	John & Marie Ferguson 32301 Via Mentone Monarch Beach, CA 92629	Home: (949)499-4621 Tahoe: (530)541-3239
Cabin #12	Norman & Joan Barney 5054 Ranch Hollow Way Antioch, CA 94531	Home: (925)753-1856 Tahoe: (530)544-0609

UPPER TRACT OWNERS (Con't.)

Cabin #13	Larry & Katie King 2081 Seventh Ave. Sacramento, CA 95818	Home: (916)441-4106 Tahoe: (530)542-4449
	Denis & Pat Donovan 7552 St. Lukes Way Sacramento, CA 95823	Home: (916)421-2849
	Brian & Diane Gebhart 1053 Dorrit Dr. Santa Rosa, CA 95401	Home: (707)575-1952
	Denis M. Donovan 1241 11 th Ave. Sacramento, CA 95818	Home: (916)446-4164
Cabin #14	David Brown (Permittee) 4 Raudo Place Santa Fe, NM 87508	Home: (505)466-4748 Tahoe: (530)544-1173
	Kevin & Janie Brown (Reservations) 2424 Carefree Circle Flagstaff, AZ 86004	Home: (928)526-8725
	Sue & Jack Marquis (Finances) 730 Cordilleras Ave. San Carlos, CA 94070	Home: (650)595-0886
Cabin #15	John & Anita Mitchell 4145 Verdosa Dr. Palo Alto, CA 94306	Home: (415)493-8507 Tahoe: (530)542-1881

LOWER EMERALD BAY CABIN OWNERS

Cabin #16	Ann O'Hanlon 616 Throckmorton Ave. Mill Valley, CA 94941	Home: (415)388-3322 Tahoe: (530)541-3863
	Salem & Eric Rice	Home: (405)426-0369
Cabin #17	Tom Cook & Linda Cook 1371 43rd. St. Sacramento, CA 95819	Home: (916)453-8996 Tahoe: (530)544-5497
Cabin #18	Charlie & Janie Kellermeyer PO Box 2246 Olympic Village, CA 96146	Home: (530)583-8806 Work: (530)583-5320 Tahoe: (530)542-2419
Cabin #19	Don & Suzanne Smith PO Box 448 Honaunau, HI 96726	Home: (808)328-7484
Cabin #20	John & Anne Osborn 2960 Paradise Dr. Tiburon, CA 94920	Home: (415)435-9051 Tahoe: (530)541-4565
	Rob & Cindi Garvie 1048 Rachele Rd. Walnut Creek, CA 94596	Home: (510)934-6049
Cabin #21	Mike & Anne Camello 37072 Shasta St. Fremont, CA 94536	Home: (510)793-8013 Tahoe: (530)541-1193
Cabin #22	Kathleen Diepenbrock 2742 Martin Luther King Jr. Way Berkeley, CA 94703	Home: (510)845-8699 Tahoe: (530)541-0893
Cabin #23	Dick & Winifred Quigley 1605 Newman Pl. Mountain View, CA 94043	Home: (415)967-4249 Tahoe: (530)544-4718
Cabin #24	Dick Hahn 428 Golden Gate Ave. Belvedere, CA 94920	Home: (415)435-9883 Tahoe: (530)541-2059

F. NORTH TAHOE FIRE PROTECTION DISTRICT SUPPORTING DOCUMENTATION

P.O. Box 5879
300 North Lake Boulevard
Tahoe City, CA 96145
(530) 583-6930
Fax (530) 583-6909



Planned Community Development

Guidelines and Conditions, Updated 7-20-01

The below fire safe guidelines and conditions are applicable to planned community development and subdivisions within North Tahoe Fire Protection District and Alpine Meadows Fire Department boundaries.

Projects and subdivisions shall comply with the below conditions and guidelines. It should be noted that these are general guidelines and that NTFPD /AMFD retains the prerogative to condition each project as needed. It is the developer's responsibility to meet the guidelines and or mitigate them by other means as approved by NTFPD / AMFD.

All projects shall comply with the following subsections of the Public Resources Code Section 4290 Fire Safe Regulations and or County Fire Safe Ordinance.

- X Road Standards, the road system shall incorporate a looped system allowing means of ingress and egress from separate points.
- X Driveway Standards
- X Emergency Water Supply Standards
- X Defensible Space Standards shall be met pursuant to PRC 4291. You are encouraged to incorporate fire safe designs and materials into building construction.

No wood roofing materials are allowed. Roofing material will be fire resistive material, principally metal, asphalt shingle, tile, or concrete.

No bark or other wood material with an extreme variation in texture that might create an unreasonable fire danger may be used as exterior siding. Wood shingles and hand split shakes may be used as exterior siding. When used the materials may not encroach within 4 feet of grade and may not comprise more than 50% of the total exterior walled surface area. In addition, the area below wood shingles and / or shakes shall be comprised of a non-combustible material such as rock or brick. Other wood siding materials, including but not limited to rough sawn or smooth boards and battens, solid, non-contoured materials with surface variations of less than 1/8 inch such as rough sawn

redwood or cedar board siding may be used upon approval by the Home Owners Association.

Additional conditions and guidelines:

The following measures for reduction of the fuel loading for the project area and surrounding timber stands must be complied with and are consistent with other projects in the community.

1. A fuel break / fuel reduction zone along the boundaries (exterior boundaries of improved parcels) shall be established as follows:

WIDTH: 300 feet

STOCKING: The stand should consist of larger diameter trees (10" or greater DBH) with a minimum of 75 sq. ft and a maximum of 100 sq. ft of basal area per acre remaining. Large diameter trees should have pruning of all branches up to 10 feet high (applies to entire project). Live crown ratio should not be less than 50%.

EXCEPTION:

In some areas it may not be feasible or practical to create a 300-foot fuel reduction zone. In those areas a 200-foot zone will be allowed on a case by case basis approved by NTFPD / AMFD. Stocking within the zone shall be as follows:

STOCKING: The stand should consist of larger diameter trees (10" or greater DBH) with a minimum of 50 sq. ft and a maximum of 75 sq. ft of basal area per acre remaining. Large diameter trees should have pruning of all branches up to 10 feet high (applies to entire project). Live crown ratio should not be less than 50%.

UNDERSTORY: Smaller diameter trees should be thinned to the level that reduces the fire ladder into the larger diameter trees. 10" diameter trees or less should have a minimum spacing of 20'. Brush should be removed by burning, chipping or broken up into discontinuous structures.

2. Logging slash over the whole project should be piled and burned or chipped and scattered, to reduce fuel load on the lots.

3. The C&R's language and corresponding documentation will allow the landowners or their designee to maintain the 300 foot fuel break / fuel reduction zone.

The final map for recording will show and record those portions of the fuel break / fuel reduction zone as appropriate as Property Owners Association property. Off site easements adjacent to the project property for the purpose of maintaining

the fuel reduction zone shall also be recorded via a separate instrument.

4. Verification by Property Owners Association acknowledging their responsibility to maintain the shaded fuel break as recorded in the C&R's.

5. If the project is within "timberland" as defined by the California Forest Practice Rules then the appropriate permits, including but not limited to the following shall be secured.

- Timberland Conversion permit under Article #7 and section 1100 of the California Code of Regulations.
- Timber Harvest plan under the California Public Resource Code 4581.

For communication pertaining to the fire requirements for projects, contact Bryce E. Keller, Division Chief at (530) 583-6930.

DUANE WHITELAW
Fire Chief

Bryce E. Keller

BRYCE E. KELLER
Division Chief,
Fire and Life Safety

Juniper Mountain Association

Post Office Box 699
Tahoe City, CA 96145-699

November 29, 2004

Chief Duane Whitelaw
North Tahoe Fire Protection District
Box 5879
Tahoe City, CA 96145

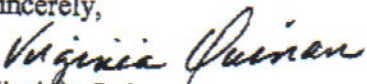
Re: Fire Fuel Reduction

Dear Chief Whitelaw,

The Juniper Mountain Association is concerned about the heavy fire fuel on the lands to the north of our subdivision owned by the US Forest Service and Squaw Creek Associates. These lands are found in USFS Sections 32 and 33. *(attached)*

We request that this area be included in fuel reduction projects funded by grants under the Federal Healthy Forest Restoration Act.

Sincerely,


Virginia Quinan

President, Board of Directors of Juniper Mountain Association

Homewood Homeowners Association

September 29, 2004

Mr. D. Whitelaw
Chief, No. Tahoe Fire Dept.
Tahoe City, CA 96145

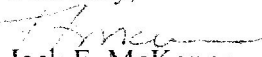
Dear Chief Whitelaw:

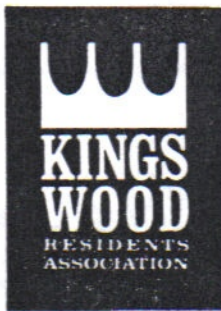
Just as a bit of background, The Homewood Homeowners Assoc. represents the interests of approximately 100 families within the Homewood subdivision. This geographical area runs from Cherry St. in the North along Hwy. 89 to Ski Bowl Way in the South. Approximately 80% of our membership claim Tahoe as their second residence.

Recently, the National Forest Service purchased several large tracts of land from Homewood Mountain Resort (HMR). These parcels adjoin a good portion of our subdivision (from Madden Creek North) at our West most boundary. Although HMR had in place a Timber Harvest Plan to do some significant logging in the previously mentioned area, due to low timber prices, it never took place. This has left the subject parcels in a very significant fire threat condition. Essentially, nothing has been done to remove the dead and dying fuel load on the forest floor for (I would guess) 100 or more years. Again, it is important to recognize that this high fuel load property immediately adjoins single-family residences and in some instances is only 40 or 50 feet from structures. Additionally, I am pleased to report that the vast majority of our residents have taken particular concern with regard to their defensible space requirements; however, the National Forest property that adjoins their parcels is a source of considerable concern.

I have attached a map that provides the exact location of this subdivision problem as well as some pictures of the typical condition of the hazard. It is certainly my hope that it will be possible, either through the National Forest Service or local agencies to address this concern of our homeowners. If I can be of additional service in this matter you can call me at (530) 877-9647 my home number or (530) 525-5448 my number here at the Lake. Thank you in advance for your consideration in this matter.

Sincerely,


Jack F. McKenna
President



NTFPD

August 17, 2004

COPY

Jennifer Arrowsmith
Administrator
Tahoe Basin Fire Safe Council
870 Emerald Bay Rd. Suite 108
South Lake Tahoe, Ca 96150

Dear Ms. Arrowsmith:

The purpose of this letter is to advise you of the concern of the Kingswood Residents Association Board of Directors regarding fuel load buildup in the Association's common areas in the Kingwood Estates subdivision.

We understand that your organization is surveying North Shore locations regarding fuel load buildup and we would appreciate it if you would include Kingswood Estates in the survey.

We have attached maps of our common areas of concern for your ready reference. They are outlined in the color orange.

John Nelson, Vice President of the Association will be our contact in this matter. He can be reached through the Association office at P.O Box 1229 Kings Beach Ca, 96143 Phone 530.546.5912, or his office at 530.546.4554.

Sincerely,

Paul Fee
Director At Large

Attach: Kingwood Estates General Plan of Development-Common Areas

Cc: John Nelson
Gerald Rucker
File