



Annex L North Tahoe Fire Protection District

L.1 Introduction

This Annex details the hazard mitigation planning elements specific to the North Tahoe Fire Protection District (North Tahoe FPD), a participating jurisdiction to the Placer County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document, but appends to and supplements the information contained in the base plan document. As such, all sections of the base plan, including the planning process and other procedural requirements apply to and were met by the District. This Annex provides additional information specific to the North Tahoe FPD, with a focus on providing additional details on the risk assessment and mitigation strategy for this special district.

L.2 Planning Process

As described above, the District followed the planning process detailed in Section 3 of the base plan. In addition to providing representation on the Placer County Hazard Mitigation Planning Committee (HMPC), the District formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table L-1. Additional details on plan participation and City representatives are included in Appendix A.

Table L-1 District Planning Team

Name	Position/Title	How Participated
Greg Smith	Captain	Attended meetings. Provided edits and updates to past annex. Provided new mitigation actions. Updated old mitigation action status. Provided asset tables and hazard id, vulnerability and capability information. Also provided map and logo.
Steve Simons	Division Chief	Provided edits and updates to past annex. Provided new mitigation actions. Updated old mitigation action status. Provided asset tables and hazard id, vulnerability and capability information.

Coordination with other community planning efforts is paramount to the successful implementation of this plan. This Section provides information on how the District integrated the previously-approved 2010 Plan into existing planning mechanisms and programs. Specifically, the District incorporated into or implemented the 2010 LHMP through other plans and programs shown in Table L-2.

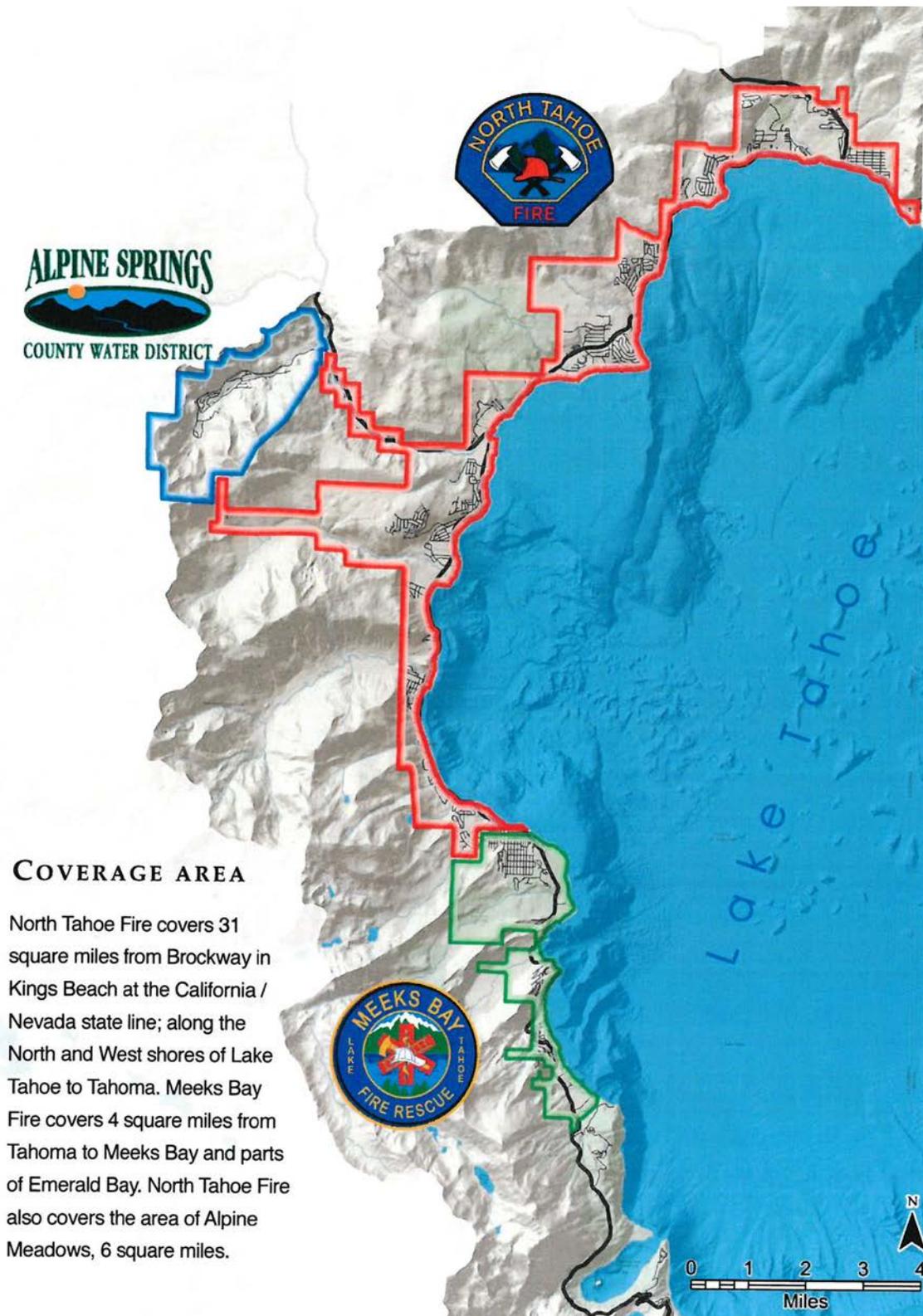
Table L-2 2010 LHMP Incorporation

Jurisdiction	Planning Mechanism 2010 LHMP Was Incorporated/Implemented In. Details?
NTHFPD	2015 Tahoe CWPP, Forest Fuels Reduction via Prescribed Fire and Chipping Programs, Placer County Emergency Operations Plan, Truckee River Geographic Response Plan.

L.3 District Profile

Figure L-1 of the Lake Tahoe Basin Fire Protection Agencies shows the area covered by the North Tahoe Fire Protection District (NTFPD). North Tahoe Fire protects all of the Placer County communities on the north and west shores of the Lake Tahoe Basin.

Figure L-1 North Tahoe FPD Service Area



COVERAGE AREA

North Tahoe Fire covers 31 square miles from Brockway in Kings Beach at the California / Nevada state line; along the North and West shores of Lake Tahoe to Tahoma. Meeks Bay Fire covers 4 square miles from Tahoma to Meeks Bay and parts of Emerald Bay. North Tahoe Fire also covers the area of Alpine Meadows, 6 square miles.

Source: North Tahoe FPD

L.3.1. District Information and Background

North Tahoe Fire Protection District serves the north and west shores of Lake Tahoe, California. The District covers over 31 square miles of territory and borders the largest alpine lake in North America. The full-time resident population is just over 18,000 people, but communities swell to well over 50,000 people on any given day in the busy winter and summer tourist seasons. The district serves a rural area and is geographically isolated due to the numerous high mountain passes, two-lane highways, harsh weather conditions, and extreme influxes of tourists. The areas served are at altitudes of 6,000 feet to over 9,000 feet.

The District is a combination fire department with five fire stations and employs 52 full-time personnel. This District is an all risk fire and EMS transporting agency, providing fire suppression and prevention, rescue, hazardous materials, and paramedic ambulance services.

The District, under long term contract, administers and provides this all risk fire and EMS service to the community of Alpine Meadows, a world-class ski resort with over 750 housing units, limited egress, and a fire station staffed during peak demand, on a nearly 24/7 days a week basis.

L.4 Hazard Identification and Summary

The District's planning team identified the hazards that affect the District and summarized their frequency of occurrence, spatial extent, potential magnitude, and significance specific to the District (see Table L-3).

Table L-3 North Tahoe FPD Hazard Identification Table

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/Severity	Significance
Agricultural Hazards	Limited	Highly Likely	Critical	Medium
Avalanche	Limited	Highly Likely	Limited	Low
Dam Failure	Significant	Unlikely	Critical	High
Drought and Water Shortage	Extensive	Likely	Critical	High
Earthquake	Extensive	Occasional	Critical	High
Flood: 100/500 year	Limited	Occasional	Critical	High
Flood: Localized Stormwater Flooding	Limited	High Likely	Limited	Medium
Landslides and Debris Flows	Limited	Occasional	Limited	Low
Levee Failure	Limited	Unlikely	Limited	Low
Seiche (Lake Tsunami)	Significant	Unlikely	Critical	High
Severe Weather: Extreme Heat	Extensive	Likely	Negligible	Medium
Severe Weather: Freeze and Snow	Extensive	Highly Likely	Critical	High
Severe Weather: Fog and Freezing Fog	Significant	Occasional	Negligible	Low
Severe Weather: Heavy Rains and Storms (Thunderstorms/Hail, Lightning/ Wind /Tornadoes)	Extensive	Highly Likely	Critical	High
Soil Bank Erosion	Limited	Occasional	Negligible	Low
Subsidence	Limited	Occasional	Limited	Low
Wildfire	Extensive	Highly Likely	Critical	High
Hazardous Materials Transport	Limited	Occasional	Limited	Medium
Geographic Extent		Magnitude/Severity		
Limited: Less than 10% of planning area		Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths		
Significant: 10-50% of planning area		Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability		
Extensive: 50-100% of planning area		Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability		
Probability of Future Occurrences		Significance		
Highly Likely: Near 100% chance of occurrence in next year, or happens every year.		Low: minimal potential impact		
Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.		Medium: moderate potential impact		
Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.		High: widespread potential impact		
Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.				

L.5 Vulnerability Assessment

The intent of this section is to assess the District’s vulnerability separate from that of the planning area as a whole, which has already been assessed in Section 4.3 Vulnerability Assessment in the main plan. This

vulnerability assessment analyzes the population, property, and other assets at risk to hazards ranked of medium or high significance that may vary from other parts of the planning area. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the main plan.

L.5.1. Assets at Risk

This section considers the District’s assets at risk, specifically critical facilities and infrastructure, natural resources, and growth and development trends. Table L-4 lists particular critical facilities and other community assets identified by the District’s planning team as important to protect in the event of a disaster.

Table L-4 North Tahoe FPD’s Critical Facilities, Infrastructure, and Other District Assets

Name of Asset	Facility Type	Replacement Value
North Tahoe FPD facilities	Essential	
Headquarters Station 51	Essential	\$15.6 million
Station 52 Training	Essential	\$13.5 million
Station 53 Homewood	Essential	\$10.5 million
Station 54 District shop	Essential	\$8.5 million
Station 55 Fuels Reduction	Essential	\$8.5 million
Station 56 Alpine Meadows	Essential	\$7.5 million
Type 1 Structure Engines X 6	Essential	\$800,000 each
Type 3 Brush Engines X 3	Essential	\$500,000 each
ALS Ambulances X 7	Essential	\$150,000 each
Command Vehicles etc.		\$60,000
Placer Co. Sheriff Dispatch & Office	Essential	
Highways, Bridges, Arterial Roads	Transport/ Lifeline	
Utilities	Transport/ Lifeline	Power, Water, Gas, Sewer, Cell Towers
CalTrans & Placer Co. DPW	Transport/ Lifeline	Facilities and Equipment
Lake Tahoe Outlet Dam	High Loss	
Schools and Shelter locations	High Loss	
Groceries stores		

Source: North Tahoe FPD

It is important to note that there are no hospitals within the North Tahoe Fire District boundaries. This becomes a significant vulnerability when the highways become impassable due to flooding, rock/mudslides, avalanches, and interstate closures.

Natural Resources

Several state or federally listed species may be found within the District boundary. These are identified, along with other species of concern found in the District, in Table L-5.

Table L-5 Species of Concern in the North Tahoe Fire Protection District

Species	Federal Status	Critical Habitat in NV/CA	Office Lead	State
Mammals				
Fisher <i>Martes pennanti</i> (West Coast DPS)	C	N/A	YFWO	CA
Birds				
Yellow-billed cuckoo <i>Coccyzus americanus</i> (Western U.S. DPS)	C	N/A	SFWO	CA/NV
Bald eagle <i>Haliaeetus leucocephalus</i>	T	N	SFWO	CA/NV
Amphibians				
Yosemite toad <i>Bufo canorus</i>	C	N/A	SFWO	CA
Mountain yellow-legged frog <i>Rana muscosa</i> (Sierra Nevada DPS)	C	N/A	SFWO	CA/NV
Fishes				
Lahontan cutthroat trout <i>Oncorhynchus clarki henshawi</i>	T	N	NFWO	CA/NV
Plants				
Webber ivesia <i>Ivesia webberi</i>	C	N/A	NFWO	CA/NV
Tahoe Yellowcress <i>Rorippa subumbellata</i>	C	N/A	NFWO	CA/NV

Source: North Tahoe Fire Protection District

Growth and Development Trends

Population growth within the NTFPD continues but is not uniform throughout. The areas within and closest to the developed communities are growing fastest and have higher housing densities. The more rural, mountainous areas are experiencing limited growth, in part due to land ownership, lack of services, and overall rugged terrain.

Unique to this part of Placer County is not the growth of full time residents, but the influx of visitors and tourists to the area, especially during the peak summer and winter seasons. While this area is home to only about 18,000 full time residents, during high season some 50,000 people, on any given day, may be enjoying the vast recreational and tourist opportunities. This spike in population creates a unique vulnerability to the area, especially in the event highways become impassable due to flooding, landslides, avalanches, or gridlocks due to high volume and extreme weather conditions. Even during the off-season, the lack of

multiple transportation routes, if closed, can leave the resident population cut off from necessary, and potentially life-saving, services.

Development Since 2010

Development in the North Tahoe area has been steady. The increase in residents has increased the number of properties and people the NTFPD has to protect.

L.5.2. Estimating Potential Losses

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table L-3 as high or medium significance hazards. Impacts of past events and vulnerability of the District to specific hazards are further discussed below (see Section 4.1 Hazard Identification for more detailed information about these hazards and their impacts on the Placer County planning area). Methodologies for calculating loss estimates are the same as those described in Section 4.3 of the base plan. In general, the most vulnerable structures are those located within the floodplain, in the wildland urban interface, other priority hazard areas, unreinforced masonry buildings, and buildings built prior to the introduction of modern building codes.

An estimate of the vulnerability of the District to each identified hazard, in addition to the estimate of risk of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

Agricultural Hazards

Likelihood of Future Occurrence—Highly Likely

Vulnerability—Medium

As the district has little agricultural industry due to altitude and climate there is little effect to agriculture. The timber industry will likely start to see the effects of the multi-year drought in the form of increased disease and mortality in the coming years.

Dam Failure

Likelihood of Future Occurrence–Unlikely

Vulnerability–High

A dam failure can range from a small uncontrolled release to a catastrophic failure caused by prolonged rainfall and flooding. The primary danger associated with dam failure is the high velocity flooding of those properties downstream of the dam. Dam failure flooding varies by area depending on which dam fails and the nature and extent of the dam failure and associated flooding.

Vulnerability to dam failures is generally confined to the areas subject to inundation downstream of the facility. Based on analysis provided in the Placer County General Plan Background Report, only four dams within Placer County have the potential to affect more than 100 persons. Of these four, a failure of the Lake Tahoe Dam could potentially impact areas within the NTFPD. Failure of this dam would be contained within the Truckee River floodway to Nevada County and could impact in excess of 1,000 people.

Drought and Water Shortage

Likelihood of Future Occurrence–Likely

Vulnerability–High

Drought- the district is experiencing a multi-year drought that is part of a much larger drought throughout the western United States. Potential effects of a multi-year drought include:

- Reduced water for domestic consumption and fire suppression.
- Stress on natural vegetation leading to increased disease and mortality.
- Drought stressed/dead vegetation contributes to increased fire danger and fire behavior, leading to larger more catastrophic wildfire incidents.

The HMPC noted that the 2014-2015 drought had impacts in the District. Crop damages were widespread, wildfire risk was increased, and businesses had felt impacts from the drought conditions.

Earthquake

Likelihood of Future Occurrence–Occasional

Vulnerability–High

No specific studies have been conducted in the local area in regards to the impacts of a large scale earthquake. In general, such an event would result in large scale widespread impacts on a regional level that could include:

- Structural collapse
- Transportation impacts
- Power and communications interruptions
- Structural and wildfire incidents
- Avalanches, mudslides, rock falls and landslides
- Dam failures and flooding
- Sieche Wave Events

- Loss of life and injuries on a large scale
- Economic impacts and business loss

Flood: 100/500 year

Likelihood of Future Occurrence–Occasional

Vulnerability–Medium

The Truckee River Watershed is the primary watershed of concern within the District boundaries. The Truckee River Watershed, with an area of approximately 2,720 square miles, encompasses the entire Lake Tahoe, Truckee River, and Pyramid Lake systems. The overflowing and diversion of Squaw Creek (upper Truckee River Basin) is responsible for major flooding events, such as the January floods of 1997, in eastern Placer County.

Flooding and soil erosion due to heavy rains and snow runoff have been a historical problem. Abundant snowfall in the mountains combined with rain and steep terrain can mean rapid runoff and flooding. Water flow can be high in peak runoff periods with historical downstream flooding. The primary impacts from flooding within the district include damage to roads, utilities, bridges, and flooding of homes, businesses and critical facilities. Road closures create difficulties in providing emergency services to areas cut off by flooding and limit the area’s ability to evacuate.

The most notable flood event impacting the District is the January floods of 1997. This flooding started in late December over a crowded holiday period, with heavy winter storms causing some 6-7 feet of snow to fall at the lake level, followed by a warm wet storm causing approximately 14” inches of rain to fall in a two-day period. Flooding was widespread over much of northern California and parts of Nevada. All of the NTFPD’s response area was impacted by flooding. Damage to infrastructure and private property was estimated at \$35 million, and included damage to bridges, highways, surface streets, utilities, and the collapse of a portable classroom. All transportation and supply routes were cut off or gridlocked and inaccessible. Mud and rockslides occurred throughout the region, with one large landslide, approximately 1 mile in length, occurring on the west shore.

Flood: Localized Stormwater Flooding

Likelihood of Future Occurrence–Highly Likely

Vulnerability–Medium

In 1997 the District experienced areas of flooding and landslides related to El Nino resulting in hazardous conditions and road closures. Impacts were to the Highway 89 corridor between Tahoe City and Truckee and the Ward Canyon area on the west shore of Lake Tahoe. Future such events could impact many areas of the district and surrounding areas.

Seiche (Lake Tsunami)

Likelihood of Future Occurrence–Unlikely

Vulnerability–High

The District response areas are at risk to seiche. This was described in Section 4.3.9 of the base plan.

Severe Weather: Extreme Heat

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Being that the district is primarily located between about 6,000 and 7,500 feet above sea level, any extreme heat events would be part of a much larger event impacting on a regional level and would be relatively moderate in impact.

Severe Weather: Freeze and Snow

Likelihood of Future Occurrence–Highly Likely

Vulnerability–High

Freeze and snow events are a major concern to the District. Snow and winter weather conditions regularly result in utility outages and the closure of major transportation routes. According to the NTFPD planning team, major winter storms have routinely cut off transportation routes in the district for hours (as recent as March 2007) to over a week (back in the 1950s), stranding thousands and causing a major impact to services and supplies.

With altitudes ranging from 6,000 to 9,000 feet above msl, extreme cold/freezing temperatures can create significant problems. Of particular concern to the District is the vulnerability of the area to broken utilities and power failures during extreme weather events. Most notably, during the mid-80s, a gas main failure occurred in Carson City, Nevada, causing a major outage throughout the region. This also resulted in an overload of the power utilities in the District, causing failures lasting several days. The District estimates that such outages lasting several days during extreme weather events occur approximately every 2-3 winters.

Severe Weather: Heavy Rains and Storms (Thunderstorms/Hail, Lightning/Wind/Tornadoes)

Likelihood of Future Occurrence–Highly Likely

Vulnerability–High

Inside the District, severe weather often occurs. The greatest damages often occur from high winds. The HMPC noted recent events in December of 2014 where winds caused damage to power lines. The HMPC provided the information in Figure L-2. During this event, a structure fire occurred that was the direct result of a wind event in which a tree fell onto an occupied residence. Fortunately all occupants escaped the building without injury. Winds in the District were recorded as high as 80 mph that date with gust on the

surrounding mountains in excess 130mph. High winds can fan the flames of wildfire in the District as well, increasing the size of wildfires very quickly.

Figure L-2 December 11, 2014 Wind Caused Damages

FDID	Incident ID	Inci Num	Exp Alm Date	Alm Time	Stn Inci	Type	Description	St Pre
fix Street	Address	St Type	St Suffix	Addr 2			Addr Type	Addr Wild Number
Xst Prefix	Xstreet	Xst Type	Xst Suffix	Rural				
31044_4TTS6BZLC	2014028592	0	12/12/2014	18:39:52	53	322	Motor vehicle accident with injuries	1 N 6937
West Lake	6937 West Lake BLVD	BLVD						
31044_4TTS49WC5	2014028578	0	12/12/2014	14:39:47	51	321	EMS call, excluding vehicle accident with injury	1 N 925 3
North Lake	925 North Lake BLVD /3	BLVD						
31044_4TTS1MNNOR	2014028557	0	12/12/2014	09:55:34	56	321	EMS call, excluding vehicle accident with injury	1 N 1960
Squaw Valley	1960 Squaw Valley RD	RD						
31044_4TTS1MMZW	2014028550	0	12/12/2014	09:24:36	53	444	Power line down	1 N 3590
West Lake	3590 West Lake BLVD	BLVD						
31044_4TTS0LLL7	2014028542	0	12/12/2014	07:08:56	52	324	Motor Vehicle Accident with no injuries	3 N
	North Side Brockway Summit							
31044_4TTRWK2DUE	2014028531	0	12/11/2014	23:08:58	52	611	North Dispatched & cancelled en route	1 N 8675
North Lake	8675 North Lake BLVD	BLVD						
31044_4TTRV746WER	2014028517	0	12/11/2014	19:59:50	56	700	False alarm or false call, Other	1 N 255
Squaw Valley	255 Squaw Valley RD	RD						
31044_4TTRRMSIU	2014028465	0	12/11/2014	11:37:51	53	631	Authorized controlled burning	1 N 2980
Electric	2980 Electric DR	DR						
31044_4TTRRUQA2	2014028463	0	12/11/2014	11:06:31	52	813	Wind storm, tornado/hurricane assessment	1 N 8872
Brook	8872 Brook AVE	AVE						
31044_4TTRRITQW	2014028462	0	12/11/2014	10:56:59	52	445	Arcing, shorted electrical equipment	2 N
Fox	Fox ST & Brook AVE	ST						
	Brook							
31044_4TTRRITQW	2014028456	0	12/11/2014	10:17:55	53	444	Power line down	1 N 796
Cascade	796 Cascade CIR	CIR						
31044_4TTRQ4JV7	2014028440	0	12/11/2014	08:55:05	51	813	Wind storm, tornado/hurricane assessment	1 N 1749
Washoe	1749 Washoe WAY	WAY						
31044_4TTRQCHNN	2014028438	0	12/11/2014	08:38:10	53	444	Power line down	1 N 5255
West Lake	5255 West Lake BLVD	BLVD						
31044_4TTRRITOD	2014028437	0	12/11/2014	08:32:58	51	444	Power line down	1 N 350
Woodview	350 Woodview CT	CT						
31044_4TTRQ8IQS	2014028435	0	12/11/2014	08:21:55	52	461	Building or structure weakened or collapsed	1 N 365
Snowflake	365 Snowflake AVE	AVE						
31044_4TTRRITNT	2014028428	0	12/11/2014	07:31:02	53	461	Building or structure weakened or collapsed	1 N 5549
Lagoon	5549 Lagoon RD	RD						
31044_4TTSROOKE	2014028427	0	12/11/2014	07:28:08	51	111	Building fire	1 N 1770
Washoe	1770 Washoe WAY	WAY						

Source: North Tahoe FPD

Wildfire

Likelihood of Future Occurrence–Highly Likely

Vulnerability–Extremely High

All communities within the District are listed on the National Fire Plan’s “Communities at Risk” list as set forth in Section 4.3.2 of the main plan.

Over one hundred years of aggressive fire suppression under the national fire suppression policy has rendered wildlands severely overgrown. Much of the private land in the District’s area is in the wildland urban interface with increasing residential development.

According to the NTFPD, the following areas of the District were prioritized for projects because of their population, values at risk, and fuel availability:

- Tahoe City
- Lake Forest
- Highlands
- Dollar Point
- Cedar Flats
- Carnelian Bay
- Agate Bay
- Tahoe Vista
- Kings Beach
- Kingswood
- Talmont
- Tahoe Park
- Pineland
- Timberland
- Skyland
- Tahoe Pines
- Tahoe Swiss Village
- Homewood
- Chamberlands
- Tahoma
- McKinney Estates.

As more people move into the area and impacts from recreational demands increase, there will be more human-caused wildfire starts each year. And, the increased number of widely scattered homes within the District adds greatly to the danger, complexity, and cost of fighting these fires.

Currently, many of the communities in the District are limited to one route access and egress in the event of a major wildfire. Historically, these routes are closed during major events, stranding many people, including visitors, away from their families and homes. So far there has been no loss of life attributed to the limited evacuation routes, but it is likely only a matter of time before people are cut off and trapped by a major fire event.

Forest overgrowth due to the efficiency of modern firefighting techniques, and to society's current election to limit forest thinning and harvesting, is a serious problem. If wildfire does not impact the forest first, native insects will eventually kill millions of trees. Explosions in insect populations usually start during a drought, when the lack of water combined with too many trees per acre render the trees too weak to fight off the insect attacks. Without a change in management practices on public lands, there is little hope of avoiding a kill off of trees similar to the kill off experienced by other national forests.

A notable recent wildfire to impact the District was the Washoe Fire in August 2007. This fire occurred in the wildland urban interface area of Tahoe Park and Tahoe Woods subdivision, along the west shore of Lake Tahoe. Although no lives were lost, the fire destroyed 5 residential structures and encompassed 19 acres. Power and gas utilities incurred damages. There were also losses to timber assets, loss of watershed protection, and loss of the aesthetic value of a scenic corridor. This event caused major disruptions to west shore and Tahoe City traffic and business on a busy summer weekend. Highway 89 in West Lake was closed for a period of time.

Due to recent droughts in the North Tahoe FPD, widespread wildfires have occurred in or near District boundaries. In the last few years several large fires have impacted the Lake Tahoe Basin in various ways. The Angora fire burned over 300 structures and the King Fire burned almost 100,000 acres to the west of the basin and almost burned into the basin. These are both described in the base plan in Section 4.2.17.

Wildland fires are a significant threat to regional power distribution systems. Power outages caused by wildland fires directly affect the safety of district residents, drastically restrict critical water system operations, and severely limit available water supplies for fire suppression.

Hazardous Materials Transport

Likelihood of Future Occurrence—Occasional

Vulnerability—Medium

Effects of a hazardous materials release are many and varied by the properties and quantities of the substance released and the setting of the release. Such incidents may result injuries, loss of life, property and environmental damages.

The NTFPD portions of the 2011 Truckee River Geographic Response Plan, the 2007 Lake Tahoe Sill Response Plan and the 2010 Placer County Emergency Operations Plan in response and mitigation to hazardous materials incidents.

L.6 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into four sections: regulatory mitigation capabilities; administrative and technical mitigation capabilities; fiscal mitigation capabilities; and mitigation education, outreach, and partnerships.

L.6.1. Regulatory Mitigation Capabilities

Table L-6 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the District.

Table L-6 North Tahoe FPD's Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan	N	
Capital Improvements Plan	N	
Economic Development Plan	N	
Local Emergency Operations Plan	Y	2010 Placer County Emergency Operations Plan
Continuity of Operations Plan	N	
Transportation Plan	N	
Storm water Management Plan/Program	N	
Engineering Studies for Streams	N	
Community Wildfire Protection Plan	Y	2015 Lake Tahoe CWPP
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	N	
Building Code, Permitting, and Inspections	Y/N	Are codes adequately enforced?
Building Code		Version/Year: 2013 UBC
Building Code Effectiveness Grading Schedule (BCEGS) Score		Score:
Fire department ISO rating:	Y	Rating: 4/4Y
Site plan review requirements	N	
Land Use Planning and Ordinances	Y/N	Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?
Zoning ordinance	N	
Subdivision ordinance	N	
Floodplain ordinance	N	
Natural hazard specific ordinance (storm water, steep slope, wildfire)	Y	Defensible requirements space enforced by CalFire
Flood insurance rate maps	N	
Elevation Certificates	N	

Acquisition of land for open space and public recreation uses	N
Erosion or sediment control program	N
Other	
How can these capabilities be expanded and improved to reduce risk?	

As indicated above, the District has several programs, plans, policies, and codes and ordinances that guide hazard mitigation. Some of these are described in more detail below.

Tahoe Community Wildfire Protection Plan, 2015

In 2015 the Tahoe Community Wildfire Protection Plan was created (2015 CWPP). This plan encompasses all areas of the Alpine Meadows and NTFPD that are at risk and directly outlines hazards and mitigations needed to preserve lives and property in these areas in the setting of a wildland fire incident. It is incorporated by reference here in support of the 2015 update to this document (Tahoe FFT.org). This website is hosted by the Tahoe Living with Fire Organization.

Codes and Ordinances

Avalanche

Placer County’s avalanche management program defines Potential Avalanche Hazard Areas (PAHAs) where the minimum probability of avalanche occurrence is 1 in 100 per year or where avalanche damage has already occurred. According to the Placer County Avalanche Ordinance the following information must be disclosed in PAHAs:

- Identification that a structure is within a PAHA;
- A warning that avalanche control work is conducted in the area and avalanche warnings will be provided as feasible; and
- Identification of sources that provide weather information and general information on avalanches.

In addition, the County limits construction as necessary in PAHAs and will not issue a building permit for construction in a PAHA without certifying that the structure will be safe under the anticipated snow loads and conditions of an avalanche.

L.6.2. Administrative/Technical Mitigation Capabilities

The board is comprised of 5 members representing 5 regions within the Lake Tahoe basin and is selected by registered voters within the District. The board serves as the governing body for the District’s more than 22,000 residents. Members of the board are elected by geographical Division for 4 years. The Board of Directors approves District Rules and Regulations and, through the Fire Chief, ensures adherence to District policies. District policy and actions may be adopted by motion, or more formally, by resolution.

The NTFPD provides services through six fire stations: Alpine Meadows, Tahoe City, Homewood, Dollar Hill, Carnelian Bay, and Kings Beach. These fire stations are staffed by 60 to 65 uniformed and support personnel. The Assistant Chief oversees the operations division which includes service delivery, communications, apparatus repair, replacement, and purchasing. The Assistant Chief is responsible for engine company staffing, alarm response guidelines, and standard operating procedures.

NTFPD’s dispatch services are provided by the Grass Valley Emergency Command Center in Grass Valley, CA. The dispatch center uses computer aided dispatching to ensure optimal resource monitoring and management utilizing the closest resource backed up by station cover assignments in a multi-tiered alarm structure.

For apparatus maintenance and repair the District employs 1 full-time Mechanic/Captain and two part-time assistants. The District pursues an aggressive vehicle replacement policy which refurbishes engines after 10 years, places them in reserve after 20 years and replaces them after 25 years. District ambulances are designed to have the ambulance module remounted on a new chassis every 5 years until replacement. The North Tahoe Fire Protection District maintenance and repair facility personnel ensure the District purchases only items of a specified quality at the least expense to the taxpayers. The District maintenance and repair facility personnel are charged with all tasks associated with providing a safe and reliable apparatus fleet at the lowest possible expense to the taxpayers. Table L-7 identifies the personnel responsible for activities related to mitigation and loss prevention in the District.

Table L-7 North Tahoe FPD’s Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	N	
Mitigation Planning Committee	N	
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	N	
Mutual aid agreements	Y	Multiple in place and on-going with allied agencies
Other		
Staff	Y/N FT/PT	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	N	
Floodplain Administrator	N	
Emergency Manager	N	
Community Planner	N	
Civil Engineer	N	
GIS Coordinator	Y	Program just starting in Fall 2015
Other		

Technical	Y/N	Describe capability Has capability been used to assess/mitigate risk in the past?
Warning systems/services (Reverse 911, outdoor warning signals)	Y	Placer Count Sherriff 911, Caltrans message signs. Routinely used for fire weather Red Flag warnings
Hazard data and information	Y	Occupancy pre-plan capabilities, MDT grant
Grant writing	Y	Admin staff
Hazus analysis	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Additional grants and further program development.		

L.6.3. Fiscal Mitigation Capabilities

Table L-8 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

Table L-8 North Tahoe FPD's Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	N	
Authority to levy taxes for specific purposes	N	
Fees for water, sewer, gas, or electric services	N	
Impact fees for new development	Y	Community Service District fees
Storm water utility fee	N	
Incur debt through general obligation bonds and/or special tax bonds	N	
Incur debt through private activities	N	
Community Development Block Grant	N	
Other federal funding programs	N	
State funding programs	Y	Equipment and program grants
Other		
How can these capabilities be expanded and improved to reduce risk?		
On-going program management and opportunities		

L.6.4. Mitigation Outreach and Partnerships

Table L-9 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information. More information can be found below the table.

Table L-9 North Tahoe FPD’s Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Yes	CERT Program
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Yes	2015 Emergency Preparedness and Evacuation Guide, portable message signs
Natural disaster or safety related school programs	Yes	Fire safety week for the schools program
Storm Ready certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	No	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Continued program management and development		

The NTFPD has automatic aid agreements with bordering Districts and mutual aid agreements with other fire agencies throughout the area. The District relies heavily upon this aid from their neighbors. Due to the high costs that are associated with a resort based economy, three-quarters of the NTFPD personnel live outside of the area served. This requires additional personnel from neighbors to respond and assist with incidents that are within the operational area.

The District is also a participating member of the Sierra Front WildFire Cooperators, a bi-state, multi-agency organization. The cooperators address numerous issues pertaining to wildfire suppression, prevention and public education.

The District also works with other agencies on wildfire-related matters. Working with professional fire experts from the U.S. Forest Service and California Department of Forestry and Fire Protection helps ensure that the District’s work complements state and federal work and is up to standard for controlling wildfires.

In implementing many of the fuels management projects, the NTFPD works closely with the Tahoe Fire and Fuels Team which consists of representatives of Tahoe Basin fire agencies, CAL FIRE, Nevada Division of Forestry and related state agencies, the Nevada Fire Safe Council, the Tahoe Regional Planning

Agency, the USDA Forest Service, conservation districts from both states, the California Tahoe Conservancy, and the Lahontan Regional Water Quality Control Board. Coordination of fuels reduction projects in the Tahoe Basin is overseen by a Multi-Agency Committee (MAC) comprised of the above agencies.

L.6.5. Other Mitigation Efforts

The District is involved in a variety of mitigation activities including, public education, fuels management projects, and other activities to reduce fuel loads and fire risk. These mitigation activities include:

- Public presentations and defensible space inspections
- Working with Homeowner's Association's Living with Fire publication
- Public outreach via website, local paper and school education programs
- Fire & Life Safety structural plan review program
- Forest Fuel's management program
- Advise and assist with water system infrastructure improvements
- Details on some of the recent, ongoing mitigation projects are noted below.

Fuel Reduction Projects

The NTFPD has partnered with the Meeks Bay Fire Protection District and the North Lake Tahoe Fire Protection Districts in Incline Village, Nevada to develop and implement a Coordinated Fuels Management and Defensible Space Program.

These organization's fuels management personnel and resources are shared and can be utilized without limitation in Meeks Bay, North Tahoe and the North Lake Tahoe Fire Districts as determined by project priority and funding availability. The combined fuels reduction dedicated staff includes a 20 person Type 2-IA hand crew, a 10 person fuels reduction module, a three person chipping crew, a registered Forester, and a NWCG qualified Type 2 Prescribed Fire Burn Boss. In 2014, the Fuels program applied for multiple grants through federal and state sources to aid in the continuation of our expanded fuels management program.

Fuels Reduction: Chipper Program

The NTFPD provides fuels reduction chipping to roughly 1200 or more properties each year, which is equivalent to over 300 acres of treatment in the district. Chipping statistics from 1999 to 2007 are provided in Table L-10. The District fuels treatment statistics vary greatly in availability by year and in numbers reported as the reporting methods have varied over the years. The reason for the large increase in these numbers in 2007 was due to the Angora Fire in 2006 that resulted in an increased need for defensible space in the region as over 300 homes were destroyed that year. It resulted in a large increase in wildfire awareness and the need for better defensible space around homes and businesses in the area. In subsequent years the numbers have stabilized and decreased at times. 2008 to 2013 were unavailable.

Table L-10 Chipping Stats 1999-2007

Season	Parcels Treated	Pounds
2015	437	152,000
2014	325	104,000
2008-2013	N/A	N/A
2007	1,323	807,500
2006	567	379,278
2005	634	353,450
2004	543	286,285
2003	636	285,100
2002	517	248,000
2001	716	427,840
2000	407	223,087
1999	546	299,277
Totals	5,889	3,309,817
5,889 Lots = 1472.25 at 1/4 acre per lot average.		

Source: North Tahoe Fire Protection District

L.7 Mitigation Strategy

L.7.1. Mitigation Goals and Objectives

The District adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

L.7.2. Mitigation Actions

The planning team for the District identified and prioritized the following mitigation action based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, partners, potential funding, estimated cost, and schedule are included.

Action 1. FCC P-25 Interoperability Radio Systems

Hazard Addressed: Multi-hazard

Issue Background: Communications is a critical factor in the operations and functions of North Tahoe Fire Protection District. Radio communications is the primary source of dispatch for all fire department operations. The current radio system is a complex network of fixed and mobile infrastructure that allows for fire resources to effectively communicate with dispatch and other public safety agencies to mitigate emergency and non-emergency incidents.

The need for effective communications, consolidated dispatch, technology updates, and multi-jurisdictional interoperability are critical to firefighter and public safety as well as property and environmental conservation. This is an unfunded mandate of significant expense that affects the local taxpayer and fire district budgets for many years. Radio Equipment has a limited service life, requires consistent maintenance and upgrades, and is an expensive expenditure for the district.

Other Alternatives: None

Existing Planning Mechanism (s) through which Auction Will BE Implemented: Federal Communication Commission (FCC) Standards and Specifications. State of California, Office of Emergency Services, Standards and Specifications. State of California, CAL FIRE, Standards and Specifications.

Responsible Office: North Tahoe Fire Protection District

Priority (High, Medium, Low): High

Cost Estimate: \$600,000 for base, mobile, portable, and fix geographical repeater radios and systems. \$50,000 yearly expenditure for dispatch services through CAL FIRE Grass Valley Emergency Command Center (Regional, Multi-agency, Public Safety Collaborated Dispatch Center).

Benefits (Losses Avoided): Technology and equipment upgrades, Inter-operability with multi -disciplinary emergency response agencies, use of a regional, multi-agency collaborated dispatch center, local regional partnerships between state & local public safety agencies with cost sharing of maintenance and development of critical infrastructure.

Potential Funding: Federal, State, County, and local funds.

Schedule: New projects are prioritized and completed as funding becomes available. Older equipment is replaced with new equipment that meets 2018 FCC guidelines and meets the Department of Homeland Security, SAFECOM, 6 Levels of Interoperability. Maintenance of current infrastructure is part of Fire District's annual budget and is supported by local tax payers. Estimated 2015-2018.

Action 2. *District GIS Technology, Equipment, Database and Mapping Improvements*

Hazard Addressed: Multi-hazard

Issue/Background: Handle and manipulate information, statistical analysis, project planning and tracking, fuels management, parcel treatment, services provided:

- GIS/GPS interface for response routes, Hydrant locations when covered by snow;
- Critical tool for many applications used in fuels management and emergency services;
- Sharing information with other agencies for project work; and
- Presentations for public education, evacuation routes, fuels management.

Other Alternatives:

Existing Planning Mechanism(s) through which Action Will Be Implemented: Tahoe Basin Fire Commission Report, Recommendation #6.

Responsible Office: North Tahoe Fire Protection District.

Priority (High, Medium, Low): High

Cost Estimate: \$30,000.

Benefits (Losses Avoided): Improved response times to emergencies, improved regional information sharing.

Potential Funding: Federal, State and local funds.

Schedule: 2016. The district has implemented a program and essential personnel have received the training to start the GIS data base project. Progress is anticipated in the coming months commensurate with available funding.

Action 3. *North Tahoe Fire Protection District Critical Facility Infrastructure Improvements*

Hazard Addressed: Multi-hazard

Issue/Background: With exception of the new station 51 (completed in 2012) and located at 222 Fairway Drive in Tahoe City, all other North Tahoe Fire District facilities were built 50 to 60 years ago and fail to meet current building codes and seismic standards for critical public safety facilities.

Scientists have studied the Lake Tahoe region for earthquake faults and have located three major faults within the Lake Tahoe Basin. According to their calculations, these faults are capable of producing quakes reaching 7.0 or above on the Richter scale. In addition to the typical and expected damage from the quake itself, these quakes are more than capable of producing large underwater landslides that have produced massive seiche waves in the basin in the ancient past. These waves are reported to have been up to 100' high and have deposited massive boulders far above the current lake level. Four of the District's five fire stations are built only a few feet above lake level and are well within the projected hazard zones for seiche wave damage. All of the facilities would sustain major damage in a heavy earthquake possibly trapping and injuring emergency response personnel and destroying emergency response units.

Funding is needed for facilities master planning, property acquisition, funding studies, plan development and construction.

Other Alternatives:

Existing Planning Mechanism(s) through which Action Will Be Implemented: A seismic upgrade and/or relocation of all North Tahoe Fire District facilities needs to be studied and completed as soon as possible.

Responsible Office: North Tahoe Fire Protection District.

Priority (High, Medium, Low): High

Cost Estimate: \$ 10-15 million + '15 est. (\$ 500K planning, permits... each station, \$3 mil. 52, 55, \$2 mil. 53, 54)

Benefits (Losses Avoided): Safety of emergency response personnel and equipment is critical for natural disaster response and mitigation.

Potential Funding: Federal, state and local pre-disaster mitigation funds.

Schedule: 5-10 years.

Action 4. Seiche Wave Warning Systems, Signs and Public Education

Hazard Addressed: Seiche

Issue/Background: Scientists have studied the Lake Tahoe region for earthquake faults and have located three major faults within the Lake Tahoe basin. According to their calculations, these faults are capable of producing quakes reaching 7.0 or above on the Richter scale. These quakes are more than capable of producing large underwater landslides that have produced massive seiche waves in the basin in the ancient past. These waves are reported to have been up to 100' high.

Most of the basin's communities are located less than 100 feet above lake level. If a seiche wave were to occur to the magnitude reached in the past, there could be significant loss of life. This type of incident could happen very rapidly with little to no warning, due to the relatively small confines of the lake basin.

A sophisticated network of warning devices coupled with information signs and regular public education could improve evacuations and save lives.

Other Alternatives:

Existing Planning Mechanism(s) through which Action Will Be Implemented: UNR and USGS research with tsunami warning systems as a template.

Responsible Office: Placer County OES/North Tahoe Fire.

Priority (High, Medium, Low): Medium

Cost Estimate: Undetermined.

Benefits (Losses Avoided): Significant life safety due to advanced warning

Potential Funding: Undetermined

Schedule: Undetermined.

Action 5. Defensible Space Inspection, Tree Marking, Chipping Program, and Public Education

Hazard Addressed: Wildfire

Issue/Background: Defensible space is the single most important action that can be taken by individual home owners to protect homes from wildland fire. It is also one of the most critical aspects of protecting the wildland from fire that originates in the community.

Inspections, free chipping, public education, enforcement, and compliance are important components to the overall success of the program and when coupled with CWPP projects, lead to improved wildland intermix safety. Chipping programs can lead to less dooryard burning, better air quality and better compliance with regulations. Inspections, public education, and enforcement are needed to help protect the entire community through uniform communications and standards.

Residential chipping services have varied in recent years due to several factors and need to continue to be available to property owners in the district to ensure adequate defensible space as required by law. This aspect of the community assistance program allows homeowners to complete defensible space on their own with the knowledge that the material will be disposed of efficiently. Disposal of material is the biggest problem for homeowners and the chipping program allows homeowners the opportunity and incentive to complete work.

Other Alternatives:

Existing Planning Mechanism(s) through which Action Will Be Implemented: TBFC Recommendations 37-42 and 44 describe actions that will assist property owners and fire agencies with attaining required defensive space for all properties within 5 years.

Responsible Office: North Tahoe Fire Protection District.

Priority (High, Medium, Low): High

Cost Estimate: \$250,000 (Annually).

Benefits (Losses Avoided): Life, property, environmental health and safety.

Potential Funding: Local, state and federal funding.

Schedule: Ongoing May through November each year.

Action 6. Hazardous Wood Roof Replacement Program

Hazard Addressed: Wildfire

Issue/Background: Historical data suggests that firebrands are a principle WUI ignition factor and that highly ignitable wood roofs can cause homes to be lost in wildland fire events without direct flame impingement into the structure.

In January 2008, NTFPD adopted fire code changes to prohibit the use of shake shingles on new construction. The high cost of wood shake roof replacement precludes many property owners from changing to Class “A” fire resistive materials. The cost/benefit relationship is difficult when roofs contain additional years of useful life. A stipend program to assist property owners with the costly conversion is felt to be the only way of achieving successful “change out” close to 100 percent.

According to the Tahoe Fire Commission Report (May 2008), there are many homes in the basin which have wood shake shingle roofs that pose a risk to the dwelling and surrounding homes as well. Furthermore, the report recognizes that replacing wood shake shingle roofs is one of the most effective retrofits a homeowner can do. Finding 17A specifically states that “the use of appropriate building materials helps prevent homes from ignition in a fire.” Finding 17B also states that “there is a need to require the retrofiting of such structures to make them safer from the hazards of catastrophic fire within the basin.” To reduce the risk posed by wood shake shingle roofs, the report recommends that local governments, with the assistance of the Tahoe Basin fire chiefs and any basin fire safe councils, pursue any grant or loan programs that may be available to assist property owners in retrofiting their residences to meet these requirements.

Other Alternatives:

Existing Planning Mechanism(s) through which Action Will Be Implemented: Existing CWPP as well as the TBFC Final Report Recommendations 45-47.

Responsible Office: North Tahoe Fire Protection District / Nevada Fire Safe Counsel.

Priority (High, Medium, Low): High

Cost Estimate: \$1,906,822 (\$1,206,822 federal share + \$700,000 non-federal share).

Benefits (Losses Avoided): In addition to the avoided loss of life and safety, the net present value of benefits calculated in the Benefit Cost Analysis is \$12,419,506. Data not included in this estimate includes the value of power lines and electric infrastructure, pumping stations and other water infrastructure, and the value of merchantable timber. Finally, there is damage to the local tourist-dependent economy and the watershed protecting the clarity of Lake Tahoe.

Potential Funding: FEMA and local funding.

Schedule: The goal stated in the Fire Commission report is to have fire resistive roofing on all structures within 10 years. North Tahoe Fire plans to begin a 5 year effort starting in 2009. The local program is expected to take at least three full years (36 months) to be complete but could be completed earlier depending upon the participation level of property owners. The proposed schedule of work is as follows:

- Outreach & marketing to prepare educational materials, handouts, and supplies – 1 month
- Management paperwork & notification to designated treatment areas – 4 months
- Homeowner receives contractor bids – 2 months
- Contractor selection and homeowners contractual agreement – 2 months
- Permit process through Building Department – 2 months
- Roofing construction and replacement – 20 months
- Close out open Building Dept permit through sign-off – 1 month

- Property owner submits for reimbursement – 1 month
- Funds advance to the Fire District – 1 month
- Project tracking and reporting to OES – 2 months

Action 7. Regional Water System Fire Protection Upgrades and Interoperability

Hazard Addressed: Wildfire

Issue/Background: The communities in the North Tahoe Fire Protection District are served by 16 different public and private water purveyors. All of these companies were started many decades ago with little to no regional master planning or concern for fire suppression. Several of these systems were installed 50-100 years ago and designed to only provide domestic water to a few seasonal customers.

Adequate fire suppression infrastructure is a key component of community fire suppression capabilities. The lack of adequate fire flow has a direct relation to life safety, environmental protection, property loss prevention and regional economic stability. Several recent structure fires could have been suppressed much quicker if there had been adequate hydrants with the proper fire flow and storage to support the fire fight. All of these fires have either extended into the wildland or had great potential to destroy hundreds to thousands of acres of National Forest land and the associated watershed leading directly into Lake Tahoe.

Current California Fire Code requires a minimum of 1000 GPM fire flow for 2 hours for a typical residential structure. This includes hydrant spacing of 500 feet or less, the necessary storage and/or refill capacity of at least 120,000 gallons, the proper main lines, pump capacity and back up power supplies. Many of the residential structures in this District exceed the typical residential square footage by 3-4 times. This, compounded with the multitude of small water companies, exacerbates the lack of adequate fire flow.

Existing and future water system facilities need to be “hardened” and protected against fire, tampering, and potential attack. Structural improvements, system redundancy, alarm systems, source identification, and regional master planning are needed to meet the stated objectives for the least cost.

Other Alternatives:

Existing Planning Mechanism(s) through which Action Will Be Implemented: Regional water purveyor capital improvement project master planning and cost study.

Responsible Office: Regional planning lead by Placer County Water Authority with cooperation of all local public and private water companies and the North Tahoe Fire Protection District.

Priority (High, Medium, Low): High

Cost Estimate: \$150-200 million.

Benefits (Losses Avoided): Life safety, environmental damage, water clarity, property loss, economic stability.

Potential Funding: Rate payers; local, state and federal funds.

Schedule: Ongoing for 10-20 years.

Action 8. *Skid Steer Loader with Transport Trailer, Fuels Reduction Masticator Attachment and Snow Blower Attachment*

Hazard Addressed: Wildfire

Issue/Background: CWPP/Fuels reduction work: Minimum impact mastication equipment can reduce hazardous fuel loads much more quickly and efficiently than hand treatment. This equipment is the most effective method of maintaining previously treated lots and also works very well in smaller urban lots. The speed and efficiency of production allows much more fuels reduction work to be done each season, thereby reducing the threat of catastrophic wild fire in the communities quickly. This goal is clearly identified in the Tahoe Basin Fire Commission's Final Report. Mastication helps eliminate the fuels without the need to wait for piles to cure and waiting for a permissible burn day. Less pile burning means better air quality, fewer resources needed for the same result and less public concern.

Critical infrastructure needs: Heavy snowfall can exceed 60 inches in a single storm. Without access to hydrants and key emergency infrastructure facilities, the ability to serve and protect the community is severely hampered.

The year round use of this District asset would prove valuable by freeing up personnel to work on other projects and components of fuels reduction and emergency services. It would allow personnel to rapidly clear hydrants during and after storms. It would lower the occurrence of workers comp. injuries with less hours spent hand treating fuels reduction projects or digging over 800 hydrants buried after each storm.

Other Alternatives:

Existing Planning Mechanism(s) through which Action Will Be Implemented: CWPP Projects, Multi-Jurisdictional Fuel Reduction and Wildfire Prevention Strategy 10-Year Plan.

Responsible Office: North Tahoe Fire Protection District.

Priority (High, Medium, Low): High

Cost Estimate: \$175,000

Benefits (Losses Avoided): Life safety and property loss prevention.

Potential Funding: Federal, State and local funds.

Schedule: To be determined.

Action 9. *Hydrant Risers, Replacements and Markers*

Hazard Addressed: Multi-hazard

Issue/Background: There are over 1,200 hydrants in the District serviced by 16 different water companies. There are many small water companies with little to no funds available for infrastructure repairs or upgrades.

Other Alternatives:

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Office: Water companies and North Tahoe Fire District.

Priority (High, Medium, Low): Medium

Cost Estimate: \$275,000. Riser parts plus labor to install \$175+\$150=\$325 per hydrant plus 17 percent administrative fee including contingency.

Benefits (Losses Avoided): Protecting lives and property by gaining faster access to water supplies especially during inclement weather.

Potential Funding: Federal, state and local funds as well as local rate payers.

Schedule: As soon as funding and resources are available. This project may be done separately or in conjunction with the regional water system upgrades and interoperability.