SHASTA COUNTY COMMUNITIES WILDFIRE PROTECTION PLAN 2016

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Shasta County Title III Secure Rural Schools Program

WESTERN SHASTA RESOURCE CONSERVATION DISTRICT

COUNTY OF SHASTA CALIFORNIA

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2016 SHASTA COUNTY
COMMUNITY WILDFIRE PROTECTION PLAN

I. INTRODUCTION

A. THE PURPOSE OF A CWPP

Increasingly, wildfire has captured the attention of California's populace. Seemingly, every summer has its rash of fires with associated impacts to the state's citizens. Air quality is affected, roads are closed, wildlife habitat and watersheds are degraded, and in too many cases, tragedies occur to families or businesses as the fires destroy structures or infrastructure.

To address the risk of wildfire in our state, the concept of community-based forest planning and prioritization has been advocated (Norwicki, 2002; Bahro et al., undated). Actual incentives for communities to engage in comprehensive planning to reduce the risk of wildfire occurred with the promulgation of the Healthy Forests Initiative (HFI) in 2002 and Healthy Forests Restoration Act (HFRA) in 2003. This act was written following the disastrous 2002 fire year when over 7.1 million acres burned in the U.S., more than twice the 10-year average (NOAA, 2002). The HFRA gave local communities and adjacent federal land management agencies (e.g., U.S.D.I. Bureau of Land Management and U.S.D.A. Forest Service) encouragement to collaborate in developing, prioritizing, and implementing forest management and hazardous fuel reduction projects. The law's process allows for integration of projects that reduce wildfire risk on both public and private lands.

According to the HFRA, for a community to be eligible for funding, a Community Wildfire Protection Plan (CWPP) must be written. At a minimum, all CWPPs must include the following elements or follow certain processes:

- **Collaboration:** CWPPs must be developed in a collaborative manner, by local and state government representatives, in consultation with federal agencies and other interested parties.
- **Prioritized Fuel Reduction:** CWPPs must identify and prioritize areas where work can be done to reduce the risk of wildfires and recommend the methods to be used to protect one or more at-risk communities and/or essential infrastructure.
- **Treatment of Structural Ignitability:** CWPPs must recommend measures that homeowners and communities can take to reduce the ignitability of structures throughout the plan's area.

A CWPP offers at least two important benefits to areas at risk from wildland fire. First, it offers the opportunity to establish a local definition and boundary for especially high risk areas where wildland vegetation and communities, rural homes, and critical infrastructure intermix. Identification of these high-risk wildland-urban interface areas (WUIs) are important because at least 50 percent of all funds appropriated for projects under the HFRA must be used within the Wildland-Urban Interface (WUIs).

The second noteworthy community benefit of a completed CWPP is that grant funding priority by state and federal agencies is given to the projects and treatment areas identified in the plan. If a federal agency proposes a fuel treatment project in an area addressed by the CWPP but identifies a different treatment method, the agency must also evaluate the communities' recommendation as part of the project's environmental assessment process. This process allows for an effective Action Plan to be developed to address risks to communities and rural areas from wildfire.

B. THE PLAN

In 2015, Shasta County entered into a consulting services agreement with Western Shasta Resource Conservation District (WSRCD) to update existing strategic fuel management plans or community wildfire protection plans (CWPP) in Shasta County and consolidate them into a single county-wide plan (Plan). The purpose of the update was to meet with Fire Safe Councils, the watershed group, landowners, and agencies to review the existing project list and priorities, move completed projects to a category of maintenance projects, add new projects, identify wildland urban interface areas, conduct risk assessments, and establish a revised list of priority projects.

The Plan update addresses values at risk, landowner objectives, the types of fuel treatments, the road system, potential funding sources, and fuelbreak locations, which together developed the updated fire safe plan. The recommendations include locating shaded fuelbreaks along key roadways, increasing publicity for the updated fire and community evacuation plan, post the Plan on the WSRCD and Shasta County Fire Safe Council websites, and continue annual neighborhood-based fuel reduction work. Background information from the original Plan was included, as well as revisions based on new information.

The 2,462,080-acre Shasta County planning area is located approximately 150 miles north of Sacramento, California with the Sacramento River in the western side of the county. Land ownership is primarily private, with some public lands managed by the National Park Service (NPS), USDA Forest Service (USFS), Bureau of Land Management (BLM), California Department of Forestry and Fire Protection (CAL FIRE), and California Department of Fish and Wildlife (CDFW). It is part of the Upper Sacramento River Basin and is bordered on the north and west by the North Coast watershed, on the south by Lower Sacramento River Basin watershed, and on the east by the North Lahontan watershed and Lassen County. The main watercourses within the Upper Sacramento Watershed are Lake Shasta, the Sacramento River, and numerous sub-watersheds which flow into the Sacramento River. These sub-watersheds are featured as Planning Areas in the Community Wildfire Prevention Plans (CWPPs) as follows:

- Cottonwood Creek North
- Cow Creek
- French Gulch/Upper Clear Creek
- Keswick Basin
- Lakehead
- Lower Clear Creek
- Old Station/Hat Creek
- Shasta West
- Shingletown
- Stillwater-Churn Creek

Population is concentrated in the southern and western portions of the county with approximately 179,533 residents (U.S. Census Bureau, 2015).

Generally, the climate of Shasta County is characterized by warm, dry summers and cool, wet winters. The average temperature and precipitation vary greatly within the watershed due to elevation ranges from 340 to 7,300 feet above sea level. The average high temperatures in July range from 80°F (at high elevations) to 99°F in the valley. The average low temperatures in December range from 21°F to 55°F. Snowfall is not common in the lower elevations; however, moderate to heavy amounts of snowfall is common above 3,000 feet. Relative humidity during the summer months is usually less than 30% during the day and rises to about 50% at night. Winter humidity usually exceeds 50%.

C. BACKGROUND

Wildfire is a natural component in the evolution of vegetation of Shasta County, located centrally in Northern California. Vegetation in the watersheds is characterized by grass and understory vegetation, forest and hardwood litter, dormant brush and slash, and chaparral brush. Shasta County experiences extreme fire weather conditions, especially from May through September.

Much of the vegetation has evolved and co-existed with fire for many years and is either dependent on fire or has adapted to the fire regime associated with the area. However, historical vegetation communities in the watershed were likely very different from today's flammable environment. The open stands of trees and diversity of ecosystems encountered by the first Europeans were largely the result of human resource management through the use of fire and frequent accidental and lightning fires. Native Americans did not simply use the resources of the forest as they found them. There is growing evidence that they actively managed the land using fire to encourage certain plant and animal species and to create and maintain desirable landscapes. The Native Americans were apparently the most important influence on the timing and location of fires, and, therefore, contributed to the maintenance of the fire-dependent ecosystem.

Successful fire suppression activities for over eighty years in the western United States and in the planning areas in particular, have significantly increased the volume and type of fuels across the landscape. The number and size of devastating wildfires impacting the western United States over the past ten years resulted in the creation of a National Fire Plan for the U.S. Departments of Interior and Agriculture. The result is a Very High Fire Hazard Severity Zone Rating throughout Shasta County by CAL FIRE. Funding has been available through the National Fire Plan, California Fire Plan and other agencies to assist local communities and watershed groups in identifying/planning and implementing fuel reduction projects.

Area Descriptions
The landscape of Shasta County is best defined by the vegetation profiles which influence fire behavior and the risk of catastrophic wildfires.

Timber West
The Douglas-fir/Ponderosa Pine forest. The area is managed for timber production. Logging slash is a common fuel component. Sufficient undergrowth of ceanothus and manzanita is present to require consideration of a live fuel component. The terrain is steep with a large amount of heavy fuels and travel times are long in this area. Communities in this area include French Gulch, Platina, Lakehead, Lakeshore, Lamoine, Sweetbriar, Castella, and Castle Crags.

Brush Area
The area adjacent to the Timber Area. This mid elevation of 1,000 to 2,000 ft. surrounds the Sacramento Valley. The area is typically chaparral with chamise and manzanita. These elevations include oak woodland fuels with a high mixture of brush fuels. Communities include the City of Shasta Lake, Mountain Gate, Old Shasta, Keswick, and French Gulch.

The lands northwest of Redding were void of vegetation by the early 1900's due to copper mining and smelter operations. This area now consists of mostly brush fields that are 50 years and older. The brush now has sufficient dead fuel and fine fuel to sustain large and damaging fires. The land to the west of Redding is at the base or lower levels of the mountains and is covered brush or oak woodland with a heavy brush understory.

The urbanized land west of Redding creates a high threat to life and property from wildfire. Subdivisions that were developed prior to 1982 often have narrow one-lane roads with no community water systems. Often the structures have a single access road. Some subdivisions were developed with fire emergency access roads. However, many of these roads are not maintained and are overgrown to the point of being impassable. Communities in the Brush Area west of Redding, include Igo, Centerville, Old Shasta, Keswick, Shasta Lake and portions of Redding.

The Brush Area east of Redding is generally located in rangeland. However, urbanization in the brush area exists in the western edge of the communities of Shingletown, Whitmore, Oak Run, Round Mountain, and Montgomery Creek. This area has experienced significant fires in the past and with current urbanization can expect future fires to be more damaging.

Grass Area
The valley floor in the south-central part of Shasta County extends from the Sacramento River outwards to an approximate elevation of 1,000 ft. This is the most urbanized area of Shasta County and includes Anderson, Redding, Bella Vista, Happy Valley, Millville, and Palo Cedro. The area is typically grassy woodland with blue oak, valley oak, gray pine, and annual grasses. There are also large areas covered by brush types and some of the woodland areas have a dense brush understory. Significant fires have occurred on the

valley floor, especially during north wind events, because the primary fuel is annual grasses, resulting in annual recurring fire danger.

Timber East
A mixed species conifer forest that begins about the 2,000 ft. elevation and varies in topography, weather and includes some hardwood species. The majority of the area is managed for timber production; therefore, logging slash is a common fuel component. Sufficient undergrowth of ceanothus and manzanita is present to require consideration of a live fuel component. The terrain is very steep with a large amount of heavy fuels and travel times are long in this area. Communities include Shingletown, Viola, Latour, Big Bend, and Burney.

Northeast County
High elevation sagebrush, juniper and ponderosa pine area. Large tracks of agricultural lands are in the Fall River Valley. With the exception of the irrigated Fall River Valley, the area has experienced damaging fires. The most significant fires were located to the north of State Route 299E and east of State Route 89. Large and damaging fires have also occurred along State Route 89 south near the communities of Hat Creek and Old Station. Portions of this area are remote and travel times are long. The fuels are very sensitive to changes in the wind speed and direction. The larger communities include Cassel, Fall River Mills and McArthur with significant urbanization occurring outside of these communities.

The proximity of urban areas to these forested areas has resulted in CAL FIRE classifying portions of Shasta County as Wildland Urban Interface (WUI), an area where homes are nestled throughout rugged topography of ridges and canyons and extensive wildland fuels. Prototype fires are hot, fast moving and highly destructive to both wildland resources and man-made improvements. Fuel accumulation and lack of defensible space are critical factors in fire losses. Urban problems of density, access, water supply, and evacuation routes are compounded in these areas of rugged topography. The area is characterized by poor road access for fire fighting equipment, even with the proliferation of single-family homes and driveways throughout the watershed in the past ten years.

The original plan and the update both focus on the rural and rural/urban interface areas of the watershed, and do not attempt to address fuel management activities within urban areas managed by the City of Redding, which has developed its own urban fire defense strategy. More information regarding the City of Redding fire defense strategy can be found by contacting:

Redding Fire Department
777 Cypress Ave
P.O. Box 496071
Redding, CA 96049-6071
Phone: (530) 225-4141
FAX: (530) 225-4322

II. GOALS AND OBJECTIVES

A list of goals and objectives are listed to reflect the hopeful outcomes of this Plan.

- Conduct a fuel inventory and develop a fuel map.
- Develop maps illustrating population centers, roads, vegetation types, and fire history.
- Develop a strategic fuels reduction plan.
- Identify long-term maintenance opportunities for fuelbreaks.
- Develop a priority list of recommendations for fuel reduction or fire-safe projects.
- Establish priorities for maintenance of existing fuel reduction projects.
- Encourage ongoing maintenance of all projects to protect the network.
- Review existing projects, identify, and map new fuel reduction projects that will provide for human safety, minimize private property loss, and minimize the potential of a wildfire burning into communities.
- Conduct asset risk assessment and prioritization of the proposed projects.
- Distribute the plans and fuels reduction information to the public.

III. METHODOLOGY

The activities necessary for the update of the *Shasta County Community Wildfire Protection Plan* (Plan) include:

Activity	Actions Taken
Meet with local watershed groups, Fire Safe Councils, landowners, and representatives from local agencies for review and assistance in assessment of risk, identification of WUI's, prioritization of fuel reduction projects, and the scope of the plan update.	Met with agency, group, and community representatives throughout 2015 and 2016.
Evaluate values at risk, such as structures and natural resources.	Reviewed and modified the potential funding sources from the existing plan.
Coordinate with agencies on their management objectives in the watershed.	Reviewed and modified the potential funding sources from the existing plan.
Identify long term maintenance options for fuelbreaks.	Reviewed and modified the potential funding sources from the existing plan.
Identify mechanical treatments and possible uses of excess fuels.	Reviewed and modified the potential funding sources from the existing plan.
Develop a priority list of recommendations and potential funding sources.	Developed the priority list from recommendations. Reviewed and modified the potential funding sources from the existing plan.
Publish final fuels reduction plan.	Completed plan on September 30, 2016.

IV. RECOMMENDED ACTIONS

Factors considered in developing this list include:

- Fire history for the area, both lightning-caused and human-caused fires.
- Heavy fuel loading conditions with closed tree canopies.
- Assets at risk.
- Common wind directions and speed.
- Roadsides overgrown with vegetation.
- Major topographical features important to fire control and weather patterns which influence fire behavior.
- Road access for fire crews.

A. MANAGEMENT ACTIONS

1. Encourage and participate in the creation of defensible space and support of a Firewise Program for neighborhoods throughout the planning area. Community members can reduce structural ignitability throughout the planning area by implementing defensible space/Firewise Programs to include the following:

    - Assess risk/structure ignitability.
    - Upgrade existing structures to fire safe building codes.
    - Replace wood roofs with approved fire safe roofing.
    - Consider fire resistant exterior siding.
    - Maintain a minimum 100-foot defensible space around structures.
    - Clean roofs and gutters annually.
    - Develop a community phone tree in case of a fire emergency.
    - Develop agreements with the county to use the reverse 911 system.
    - Remove ladder fuels.
    - Clean and screen chimneys.
    - Maintain green grass and fire resistant plants within 30 feet of structures.
    - Move all flammable material such as wood piles, propane tanks, etc. at least 30 feet from homes.
    - Remove dead, dying, or diseased shrubs, trees, dried grass, fallen branches and dried leaves 100 feet around structures.
    - Attach a hose that can reach to all parts of the structures.
2. Seek funding to conduct fuel inventories to determine type and scope of future fuelbreaks.
3. Work with agencies, landowners, and residents to identify fire access/escape routes for construction of shaded fuel breaks.
4. Seek funding to identify and develop strategic water sources, including additional cisterns, throughout the watersheds.
5. Seek funding to identify and develop wildfire staging areas to reduce citizen and firefighter risks from future large wildfires.

6. Seek funding to locate and illustrate all existing water sources such as ponds, pools and streams and access routes for fire engines.
7. Seek funding to **i**nstall signs at major road intersections to indicate the location of existing water sources within the watershed.
8. Seek funding to **i**nstall reflective road signs on private and county roads to help firefighters and other emergency response teams locate and communicate target destinations.
9. Seek funding to develop and disseminate educational information about fire prevention and emergency planning to all residents in the watershed.
10. Seek funding to develop an evacuation plan for the watershed to provide residents with information regarding evacuation procedures, emergency shelters, and safe escape routes.
11. Seek funding to continue CAL FIRE's VMP program objectives within the watershed, concentrating on larger ownerships with an emphasis on noxious weed eradication and converting chaparral to annual grasslands.
12. Seek funding to build or improve road access to existing and developed water sources.
13. Seek funding to identify and map the location of landowners with water hookups for fire engines.
14. Seek funding to **c**ontinue to provide property owners with the means to develop defensible space around homes.
15. Seek funding to coordinate work with large-scale landowners and managers to assure fuel reduction activities on their properties are complemented by other fuel reduction projects throughout the Plan area.
16. Seek funding to coordinate fuel reduction projects with Redding Electric Utility, Western Area Power Administration, and PG&E transmission line clearing and biomass thinning projects.

B. PROPOSED PROJECTS

The identified fuel reduction projects are primarily roadside shaded fuelbreaks intended to slow down a wind-driven fire, create safe fire access for fire personnel, and escape routes for residents. These projects are listed, prioritized, and mapped in the Planning Area sections.

C. PLAN UPDATE

The Community Wildfire Protection Plan is intended to be updated and assessed periodically. Agencies and landowners are invited to submit additional projects that would provide community protection. Additional new projects will be displayed in an update appendix to this plan and approved by the Shasta County Board of Supervisors.

V. VALUES AT RISK

A. RESIDENCES AND MAJOR STRUCTURES

According to the 2015 Census, urban development within Shasta County has significantly increased over the past several years. As more people build homes in the rural areas with severe fire hazard potential, more lives are at risk from increased fire starts. As a result, many homes within Shasta County are surrounded by dense fuels and severe fire hazard. Building design, maintenance around homes, and wildfire defense planning can significantly influence the impacts of wildfires. Aside from urban/residential communities and commercial forest land, the majority of private lands are primarily used for agriculture and grazing.

According to the 2015 Shasta/Trinity Unit Strategic Fire Plan, the following have been recognized as communities at risk (those recognized as a federal threat are marked):

TABLE 1
2015 CALFIRE SHASTA-TRINITY UNIT RECOGNIZED COMMUNITIES AT RISK

Community	Federal Threat	Community	Federal Threat	Community	Federal Threat
Anderson		Fall River Mills	X	O'Brien	X
Beegum	X	Forest Glen	X	Oak Run	
Bella Vista	X	French Gulch	X	Old Station	X
Big Bar	X	Gibson	X	Ono	
Big Bend	X	Glenburn		Palo Cedro	
Burney	X	Hat Creek	X	Pitville	X
Burnt Ranch	X	Hayfork	X	Platina	X
Cassel	X	Hyampom	X	Redding	
Castella	X	Igo	X	Redding Rancheria	X
Centerville	X	Junction City	X	Roaring Creek Rancheria	X
Central Valley	X	Keswick	X	Round Mountain	X
Coffee	X	Lakehead	X	Shasta	X
Cottonwood	X	Lamoine	X	Shingletown	X
Covington Mill	X	Lewiston	X	Sims	X
Dana	X	McArthur		Trinity Center	X
Del Loma	X	Millville		Weaverville	X
Denny	X	Montgomery Creek	X	Whitmore	
Douglas City	X	Mountain Gate	X	Wildwood	X

B. FOREST LAND

Shasta County contains several thousand acres of federal forestland and private timber production zones. The majority of publicly owned forestland within Shasta County is owned and managed by the USDA Forest Service and the Bureau of Land Management. These private lands are managed or owned primarily by W.M. Beaty & Associates, Roseburg Resources, and Sierra Pacific Industries for commercial purposes and are regulated by the California Forest Practice Rules; the intent of the Forest Practice Act is to ensure preservation and protection of fish, wildlife, forests, and streams. Given the high economic and ecological value of wood products, it is considered a valuable asset. Unfortunately, most of these forests are located adjacent to dense, contiguous thickets of chaparral, which creates an extreme fire hazard risk. When wildfires start in the brushy foothills of the watershed, the fire quickly climbs the foothills into the forests and tree canopies, creating a very hazardous condition.

C. VEGETATION

Shasta County is composed of very diverse vegetative communities as a result of the watersheds in the northern end of the Sacramento Valley and the southern ends of the Klamath and Cascade Mountain ranges. See Table 2 for the Special Status vegetative species found in Shasta County.

These vegetative communities are mostly composed of mixed conifer-pine in the north, mixed conifer-fir in the east, blue oak woodland in the south, and oak woodlands and mixed chaparral stands with frequently occurring meadows throughout. This vegetation type characterizes the lower elevation watersheds. The mid-elevation areas are characterized by California mixed chaparral species, while the higher elevations are composed of mixed conifer, Douglas-fir and true fir stands The remaining portions are composed of Serpentine species, riparian species, agricultural and urban development, and barren rock. A large portion of the area suffered from historic mining activities which resulted in massive vegetative type conversion from conifer dominated vegetative communities to a highly flammable chaparral vegetative community dominated by manzanita and toyon. Highly flammable non-native species such as brooms and tree-of-heaven are also conspicuous throughout the county.

Montane Hardwood/Hardwood-Conifer — This habitat exists in the heavy precipitation zone along the northern fringe of the Study Area, generally on steep slopes. Trees include evergreen oaks (Interior live oak, *Quercus wislizeni* or Canyon Live Oak, *Q. chrysolepis*) and pines, including Foothill (*Pinus sabineana*) and Ponderosa Pine (*P. ponderosa*). The habitat often has a moderate understory shrub layer that helps create ladder fuels and difficult firefighting conditions. This is the second most common habitat type found in the Study Area and an example is shown in Figure 1.

Figure 1. Montane Hardwood/Hardwood-Conifer Habitat

Blue Oak-Foothill Pine — This habitat is characterized by a mix of Blue Oak (*Quercus douglassii*) with Foothill Pine (see Figure 2). It may occasionally have a dense understory layer of shrubs, including *Ceanothus* spp. and Manzanita (*Arctostaphylos spp*.) and other species. This habitat is generally found in the northern half of the Study Area and on hill sides. The combination of dense shrub understory and moderate to dense tree overstory can create significant "fuel ladders".

Figure 2. Blue Oak-Foothill Pine Habitats

Blue Oak and Valley Oak Woodlands — These stands generally grow in open conditions with a herbaceous understory layer. Valley oak tends to grow on deeper soil in valley bottoms and blue oaks tend to be found on hill slopes and in areas with poorer soils (Figure 3). Blue Oak stands are widely distributed through the Study Area, both on hilly and flat terrain, while Valley oak stands are much more restricted in acreage and are generally found near streams or along terraces. Valley Oak stands, near streams, can have dense shrub understories.

Figure 3. Blue Oak Woodland Habitats

Chaparral — These habitats consist of dense shrublands, especially *Ceanothus spp*. and *Arctostaphylos spp*. They generally occur on steep hillsides in the northern and central portions of the Study Area (Figure 4). This vegetation tends to burn intensely.

Figure 4. Chaparral Habitats

Riparian — Riparian habitats grow adjacent to streams or other waterbodies and support native Willows (*Salix spp*.), Fremont Cottonwood (*Populus fremontii*), Valley Oak, and a variety of shrub understory species. Confined to near-water locations, riparian habitat occurs in narrow stringers of small size and are difficult to accurately identify with statewide typing efforts. The extent of riparian habitat is likely underestimated.

Annual Grasslands — Generally, this habitat is found in the central and southern third of the Study Area. It consists of herbaceous vegetation (grasses and forbs) with few trees or shrubs. The light, homogeneous fuels create conditions where fires can move rapidly when wind driven (Figure 5); however, fires burning in these habitats are relatively easy to extinguish.

Figure 5. Annual Grassland Habitats

Agricultural — This land is used for crops and is usually irrigated (Figure 6). Ag land is generally found in the central and southern thirds of the Study Area. Due to the irrigation and lack of fuel ladders, these habitats rarely suffer from devastating wildfires.

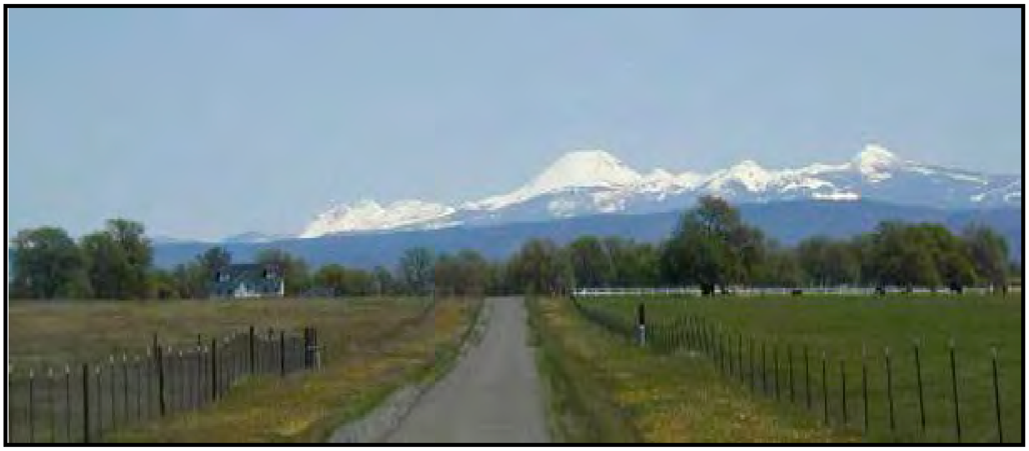

Figure 6. Agricultural Habitats

Urban — These areas are dominated by homes and outbuildings. Vegetation consists of evergreen or deciduous shrubs or trees with irrigated areas, including lawns. Urban habitats can be close to or intermixed with wildland habitats, creating challenging firefighting conditions (Figure 7). Urban habitats exist in the Study Area within and along the peripheries of Shasta Lake City, the north portions of Redding, and in other rural subdivisions. This mixture of flammable vegetation types with heavy fuel concentrations in and around homes and businesses creates especially dangerous situations in the WUI areas

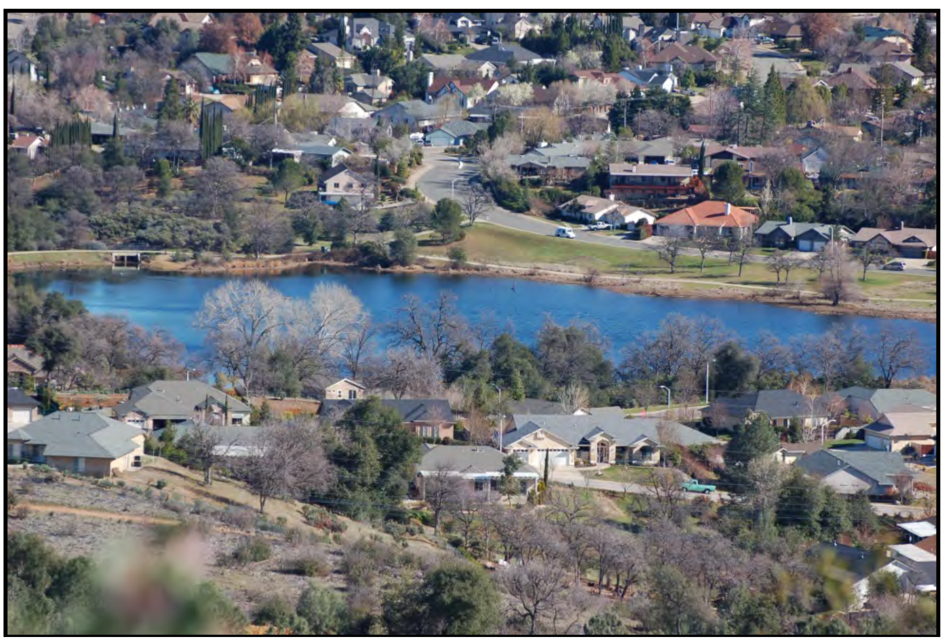

Figure 7. Urban Habitats

Barren and Water — Barren habitats, such as mines and manufacturing sites, have been disturbed by human activities and have sparse vegetation which does not provide fuel for wildfires. However, there may be infrastructure sited on these habitats that are vulnerable to nearby wildfires.

Water exists as small ponds scattered throughout the Study Area. (No images of these habitats are shown.)

D. FISH AND WILDLIFE

The area is uniquely situated within multiple ecological regions: the Sacramento Valley, the Klamath Mountains, Sierra Nevada, and the southern extent of the Cascade Range. This results in very diverse flora and fauna regimes. In general, the watersheds of Shasta County provide suitable habitat for a wide variety of wildlife species.

The main stem of the Sacramento River, in addition to tributaries, provide suitable habitat for anadromous fish species as well as resident cold water and warm water fish species. The oak woodland, meadows, and chaparral vegetation types appear to provide quality habitat for foraging species and a healthy prey base for predators. The conifer stands, located within the upper reaches of the county, also provide foraging opportunities as well as habitat for species that require a dense overstory and an abundance of horizontal structure.

Fall-run, late fall-run, and spring-run Chinook salmon and steelhead use various reaches depending on life history needs. Adult fall-run Chinook salmon ascend northern Sacramento River tributaries and spawn in late October through November. Juvenile salmon begin migrating following emergence as early as December, and smolts continue to leave the stream through May (CDFG, 1978).

Historically, adult fall-run Chinook salmon return to spawn in the Sacramento River tributaries of Shasta County each year, however, over the last several years the fall-run has declined drastically throughout the Sacramento River watershed (The Pacific Fishery Management Council, February 2016), and the 2015 fall-run is lower than 2014. *The Final Restoration Plan for the Anadromous Fish Restoration Program* (USFWS, USBR, 2001) established a population target of 28,150 Chinook salmon over four Shasta County watersheds.

The California Natural Diversity Data Base (CNDDB) was queried to determine which “special status” fish, wildlife, and plant species have been noted within Shasta County (TABLE 2). The term “special status” refers to those species that have some form of federal or state protection or are being considered for legal protection.

TABLE 2
SPECIAL STATUS SPECIES NOTED WITHIN SHASTA COUNTY (CNDDB, 2016)

Scientific name	Common Name	Status[1]
Accipiter gentilis	northern goshawk	CSC
Actinemys marmorata	western pond turtle	CSC
Agrostris hendersonii	Henderson's bentgrass	CNPS-1
Agelaius tricolor	tricolor blackbird	CSC
Anisocarpus scabridus	scabrid alpine tarplant	CNPS-1
Antrozous pallidus	pallid bat	CSC
Aplodontia rufa californica	Sierra Nevada mountain beaver	CSC
Arctostaphylos klamathensis	Klamath manzanita	CNPS-1
Argeratina shastensis	Shasta argeratina	CNPS-1
Ascaphus truei	Pacific tailed frog	CSC
Astragalus lemmonii	Lemmon's milk-vetch	CNPS-1
Astragalus pulsiferae var. suksdorfii	Suksdorf's milk-vetch	CNPS-1
Astragalus rattanii var. jepsonianus	Jepson's milk-vetch	CNPS-1
Balsamorhiza macrolepis	big-scale balsamroot	CNPS-1
Boechera serpenticola	serpentine rockcress	CNPS-1
Botrychium crenulatum	scalloped moonwart	CNPS-2
Botrychium montanum	western goblin	CNPS-2
Botrychium virginianum	rattlesnake fern	CNPS-2
Branchinecta lynchi	vernal pool fairy shrimp	FT
Brodiaea matsonii	Sulphur Creek brodiaea	CNPS-1
Brodiaea rosea	Indian Valley brodiaea	CE; CNPS-1
Calochortus longebarbatus var. longebarbatus	long-haired star-tulip	CNPS-1
Calochortus syntrophus	Callahan's mariposa-lily	CNPS-1
Carex comosa	bristly sedge	CNPS-2
Carex scoparia	pointed broom sedge	CNPS-2
Castilleja rubicundula var. rubicundula	pink creamsacs	CNPS-1
Clarkia borealis ssp. arida	Shasta clarkia	CNPS-1
Corynorhinus townsendii	Townsend's big-eared bat	CC; CSC
Cottus asperrimus	rough sculpin	CT; protected
Cottus klamathensis macrops	bigeye marbled sculpin	CSC
Cryptantha crinite	silky cryptantha	CNPS-1
Cypseloides niger	black swift	CSC
Dendroica petechia brewsteri	yellow warbler	CSC
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	FT
Empidonax traillii	willow flycatcher	CE
Emys marmorata	western pond turtle	CSC
Epilobium oreganum	Oregon fireweed	CNPS-1
Epilobium siskiyouense	Siskiyou fireweed	CNPS-1
Eriastrum brandegeeae	Brandegee's eriastrum	CNPS-1
Eriastrum tracyi	Tracy's eriastrum	CNPS-1
Eriogonum ursinum var. erubescens	blushing wild buckwheat	CNPS-1
Erythranthe taylorii	Shasta limestone monkeyflower	CNPS-1
Erythronium revolutum	coast fawn lily	CNPS-2
Erythronium shastense	Shasta fawn lily	CNPS-1
Euderma maculatum	spotted bat	CSC
Falco peregrinus anatum	American peregrine falcon	CSC
Galium serpenticum ssp. scotticum	Scott Mountain bedstraw	CNPS-1
Gratiola heterosepala	Boggs Lake hedge-hyssop	CE; CNPS-1
Grus canadensis tabida	greater sandhill crane	CT
Gulo gulo	California wolverine	CT; protected
Haliaeetus leucocephalus	bald eagle	FD
Haplodontium tehamaense	Lassen Peak copper moss	CNPS-1
Harmonia doris-nilesiae	Niles' harmonia	CNPS-1
Harmonia stebbinsii	Stebbins' harmonia	CNPS-1

Horkelia daucifolia var. indicta	Jepson's horkelia	CNPS-1
Hydromantes shastae	Shasta salamander	CT
Juncus digitatus	finger rush	CNPS-1
Juncus leiospermus var. leiospermus	Red Bluff dwarf rush	CNPS-1
Juncus luciensis	Santa Lucia dwarf rush	CNPS-1
Lasiurus blossevillii	western red bat	CSC
Lavinia symmetricus mitrulus	Pit roach	CSC
Legenere limosa	legenere	CNPS-1
Lepidurus packardi	vernal pool tadpole shrimp	FE
Leptosiphon nuttallii ssp. howellii	Mt. Tedoc leptosiphon	CNPS-1
Lepus americanus klamathensis	Oregon snowshoe hare	CSC
Lewisia cantelovii	Cantelow's lewisia	CNPS-1
Lewisia cotyledon var. heckneri	Heckner's lewisia	CNPS-1
Limnanthes floccose ssp. bellingeriana	Bellinger's meadowfoam	CNPS-1
Martes americana humboldtensis	Humboldt marten	CSC
Martes pennanti (pacifica) DPS	Pacific fisher	FC; CC
Mimulus pygmaeus	Egg Lake monkeyflower	CNPS-1
Mylopharodon conocephalus	hardhead	CSC
Neviusia cliftonii	Shasta snow-wreath	CNPS-1
Oncorhynchus mykiss ssp. 2	McCloud River redband trout	CSC
Oncorhynchus myckiss irideus	steelhead – Central Valley DPS	FT
Oncorhynchus tshawytscha spring-run	Chinook salmon – Central Valley spring-run ESU	FT; CT
Oncorhynchus tshawytscha winter-run	Chinook salmon – Central Valley winter-run ESU	FE; CE
Orcuttia tenuis	slender Orcutt grass	FT; CT; CNPS-1
Pacifastacus fortis	Shasta crayfish	FE; CE
Pandion haliaetus	osprey	C-FPA
Panicum acuminatum var. thermale	Geysers panicum	CE; CNPS-1
Paronychia ahartii	Ahart's paronychia	CNPS-1
Pekania pennant	fisher – West Coast DPS	FC; CC; CSC
Penstemon filiformis	thread-leaved beardtongue	CNPS-1
Perognathus inornatus inornatus	San Joaquin pocket mouse	CSC
Polemonium pulcherrimum var. shastense	Mt. Shasta sky pilot	CNPS-1
Polygonum polygaloides ssp. esotericum	Modoc County knotweed	CNPS-1
Progne subis	purple martin	CSC
Puccinellia howellii	Howell's alkali grass	CNPS-1
Rana boylii	foothill yellow-legged frog	CSC
Rana cascadae	Cascades frog	CSC
Riparia riparia	bank swallow	CT
Sagittaria sanfordii	Sanford's arrowhead	CNPS-1
Salvelinus confluentus	bull trout	FT; CE
Sedum paradisum	Canyon Creek stonecrop	CNPS-1
Silene occidentalis ssp. longistipitata	long-striped campion	CNPS-1
Silene salmonacea	Klamath Mountain catchfly	CNPS-1
Smelowskia ovalis	alpine smelowskia	CNPS-1
Spea hammondii	western spadefoot	CSC
Taricha torosa	Coast Range newt	CSC
Taxidea taxus	American badger	CSC
Thelypodium howellii ssp. howellii	Howell's thelypodium	CNPS-1
Trifolium siskyouense	Siskiyou clover	CNPS-1
Tuctoria greenei	Greene's tuctoria	FE; CNPS-1
Vulpes vulpes necator	Sierra Nevada red fox	CSC

Notes: [1]FE=Federally Endangered; FT=Federally Threatened; FD=Federally Delisted; FC=Federal Candidate for Listing; CE=CA Endangered; CT=CA Threatened; CSC=CA Species of Concern; CD= CA Delisted; CC=CA Candidate for Listing; CNPS-1=Rare and Restricted to CA; CNPS-2=Rare in CA, more common elsewhere; C-FPA=CA Forest Practices Act.

E. WATER QUALITY

There is a limited amount of snowpack that can accumulate in any given year due to the relative low elevations of the majority of the area. This reduces seasonal storage opportunities and produces a hydrology with abrupt swings closely correlated to storm events. Watershed runoff is flashy, high in the rainy season, and low in the dry season.

The water quality of Shasta County watersheds are generally considered good from a drinking water standard perspective. There is some concern regarding the regular contribution of suspended sediments and turbidity to the Sacramento River mainstem. Surface water flowing from burned areas may carry increased levels of sediment, organic debris, and chemicals that may contribute to significant degradation of water quality and habitat.

F. SOILS

The Soil/Vegetation Survey of California, conducted by the Pacific Southwest Forest and Range Experimental Station, describes soil types such as those with a moderate-to-high Erosion Hazard Rating (EHR). Fuels management activities located on unstable soils or on slopes in excess of 40% can stimulate erosion processes or exacerbate existing erosion problems; therefore, prior to any fuels management activities, all soil types within any future project area will be identified and evaluated to determine the erosion hazard. Projects will be designed to prevent or minimize erosion by reducing soil disturbance, maintaining vegetation where appropriate, avoiding steep and unstable slopes if possible, incorporating the use of grass seed or other fire resistant vegetation as a means to provide soil stabilization.

High intensity wildfire damages soil by incinerating roots and the humus layer (organic portion of soils) that hold soils together and provide energy dissipation. In addition, the loss of large areas of vegetation can reduce evapotranspiration and increase peak flow, which can result in augmented erosion potential, adversely affecting watershed resources. Additionally, many life forms, including invertebrates of phylum Arthropoda that are essential for cycling plant material and fixing atmospheric gases, are unknowingly destroyed. These invertebrates eventually re-establish their populations, but this time is lost while maintaining and building up the soils. Overtime, continual burning will result in soil depletion, similarly as continual plowing and crop harvesting will deplete the soil of mineral nutrients and negatively affect the soil structure. Fortunately in this area of California, there exist relatively young volcanic soils in the mountains and recent alluvial soils in the valleys that can tolerate fire without immediately showing the negative effects. However, continued burning can have long-term negative effects (National Park Service, 2002; Richards, 2002).

Low intensity prescribed fires in light to medium fuels seldom produce enough heat to significantly damage soil or increase the erosion potential within a given watershed. The chemical and physical properties of soil change dramatically after a high intensity fire. Loss of organic matter causes the soil structure to deteriorate, and both the water-storing and transmitting properties of soils are reduced. The living tissues of microorganisms and plants can be damaged by fire if the temperatures are above 1200 degrees F (DeBano 1970).

Drought conditions over the last five years have created environmental strains with increased fuels and volatile fire behaviors across the state. These conditions have increased the potential of high-intensity fires.

VI. SUPPORTING PLANS, ORGANIZATIONS AND AGENCIES

A. NATIONAL FIRE PLAN

In 2001, the Chief of the USDA Forest Service published a *National Fire Plan* (U.S. Department of Interior and U.S. Department of Agriculture, 2001), which is a cohesive strategy for improving the resilience and sustainability of forests and grasslands at risk; conserving priority watersheds, species and biodiversity; reducing wildland fire costs, losses and damages; and to better ensure public and firefighter safety. To achieve these goals, work began to improve firefighting readiness, prevention through public education, rehabilitation of watershed functions, hazardous fuel reduction, restoration, collaborative stewardship, monitoring jobs, and applied research and technology transfer.

The objective of the plan is to describe actions that could restore healthy, diverse, and resilient ecological systems to minimize the potential for uncharacteristically intense fires on a priority basis. Methods include removal of excessive vegetation and dead fuels through thinning, prescribed fire and other treatment methods. The focus of the strategy is on restoring ecosystems that evolved with frequently occurring, low intensity fires. These fires typically occurred at intervals of between 1-35 years and served to reduce the growth of brush and other understory vegetation while generally leaving larger, older trees intact. The report is based on the premise that sustainable resources depend on healthy, properly functioning, resilient ecosystems. The first priority for restoration is the millions of acres of already roaded and managed landscapes that are in close proximity to communities. More information about the *National Fire Plan* is available on the Internet at www.forestsandrangelands.gov.

B. THE CALIFORNIA FIRE PLAN AND CAL FIRE

The California Fire Plan (2010) has seven strategic goals:

- Identify and evaluate wildland fire hazards.
- Articulate and promote the concept of land use planning and individual landowner objectives and responsibilities.
- Support the development and implementation of wildland fire protection plans and safety zones.
- Increase awareness, knowledge, and implemented actions to reduce human loss and property damage from wildland fires.

- Develop methods to integrate fire and fuels management practices with landowner priorities.
- Determine the level of resources necessary to protect identified assets at risk.
- Address post-fire responsibilities for natural resource recovery, such as watershed protection, reforestation, and ecosystem restoration.

A key product of the Fire Plan is the identification and development of <u>wildfire safety zones</u> to reduce citizen and firefighter risks from future large wildfires. Initial attack success is measured by the percentage of fires that are successfully controlled before unacceptable costs are incurred. <u>Assets at risk</u> are identified and include citizen and firefighter safety, watersheds, water, timber, wildlife, habitat, unique areas, recreation, range structures, and air quality. Air quality is also a factor based on the annual average acres burned by wildfires from 1985-1994, and CAL FIRE calculates wildfires emit almost 600,000 tons of air pollutants each year.

CAL FIRE is responsible for fire suppression on privately-owned wildlands and provides emergency services under cooperative agreements with the counties. CAL FIRE is also responsible for most of the state lands and some federal lands through agreements with federal agencies. The overall goal to reduce total costs and losses from wildland fire in California by protecting assets at risk through focused pre-fire management prescriptions and increasing initial attack success.

CAL FIRE shares responsibility for wildland fire protection with the National Park Service and the Bureau of Land Management on all ownerships, except those managed by the Whiskeytown National Recreation Area (WNRA). CAL FIRE and the WNRA have entered into a cooperative agreement for dispatching and resource sharing on all wildland fires occurring in the “mutual threat zone” near WNRA. The cooperative agreement, in conjunction with the California Cooperative Fire Agreement on Wildland Fire Suppression between CAL FIRE, NPS, and BLM, outlines the cooperative sharing of resources for wildland fire suppression, since wildfires do not recognize political or ownership boundaries.

The safety and asset assessments in the plan enable fire service managers and stakeholders to set priorities for pre-fire management project work. Pre-fire management includes a combination of fuels reduction, ignition management, fire-safe engineering activities and improvements to forest health to protect public and private assets.
CAL FIRE finds there is a direct relationship between reduced expenditures for pre-fire management and suppression, and increased emergency fund expenditures, disaster funding, and private taxpayers’ expenditures and losses.

The State Board of Forestry and CAL FIRE are currently conducting a comprehensive update of the state fire plan for wildland fire protection in California. The overall goal of the existing plan is to reduce total costs and losses from wildland fire by protecting assets at risk through focused pre-fire management prescriptions and increasing initial attack success. CAL FIRE’s statewide Initial Attack Fire Policy is to aggressively attack all wildfires, with the goal of containing 95% of all fire starts to 10 acres or less.

1. **<u>Shasta-Trinity Unit Strategic Fire Plan (2015)</u>**

The Shasta-Trinity Unit Strategic Fire Plan documents the assessment of the wildland fire potential within the Shasta-Trinity Unit. It includes stakeholder contributions, priorities, and identifies strategic targets for pre-fire solutions. The goal of this plan is to reduce total cost and losses from wildfire by protecting assets at risk through focused pre-fire management prescriptions and increasing initial attack success. This plan utilizes the strategic objectives and fire plan framework identified in the *California Fire Plan* and incorporates them into the planning and implementation process composed of:

- Information on hazard and risk assessment
- Land use planning
- Shared vision among communities and development of protection plans
- Shared vision among multiple fire protection jurisdictions and agencies
- Levels of fire suppression and related services
- Pre-fire management
- Post-fire recovery

Both Shasta and Trinity Counties have a history of large and damaging fires. The continued urbanization of the Unit's wildland areas significantly increases both the damage and ignition potential. It is imperative that the Unit continues to have accurate and current assessments. The Unit must also, while working with local government and stakeholders, incorporate the fire plan analysis into current and future policy decisions when they relate to the wildland areas. Significant amounts of the population and their properties are at risk within the Unit. Residents must provide and maintain a defensible space around their properties. Fuels along existing roadways should also be maintained in order to ensure safe passage. Fuelbreaks and post-fire fuel management are required to help alleviate the risk of fire and help restore a healthy wildland environment. To achieve these; education, enforcement, fuels management and financial assistance should continue to be made available.

Pre-fire planning and fuels management projects including those identified by the Vegetation Management Program (VMP) and the California Forest Improvement Program should receive specific line item status in the California budget. Prevention and education efforts must continue and when possible, concentrate on the reduction or elimination of preventable fire ignitions.

In summary, CAL FIRE believes that cooperative fire protection, fuels reduction, and fire prevention must be linked and an extensive network of collaboration in order to have future success in dealing with the wildfire problems within Shasta County.

C. FEDERAL FORESTS

USDA FOREST SERVICE

The USDA Forest Service is responsible for managing approximately 426,138 acres in Shasta County, which include the Lassen National Forest (LNF) to the east, and Shasta-Trinity National Forest (STNF) to the west. Though the responsibility of fire incidents is depending on where the fire is located, it can include CAL FIRE, local ranger districts, volunteer fire departments, the National Park Service, or the Forest Service.

The STNF completed a *Fuels Analysis and Strategy* to provide a basis for managers to make decisions concerning placement and priorities of fuels management projects. It is a Forest level analysis meant for Forest level considerations, though it states it may also be used as a tool for project level planning. The analysis characterizes the STNF in terms of hazard, risk, and value. Hazard is defined as fire behavior potential, which has implications for resource damage as well as suppression capability. Risk is the probability of a fire occurring based on local fire history. Value refers to the monetary, ecological, or political worth of a definable area. All three areas (hazard, risk, and value) are quantified by a measure of low, moderate, or high through a combined use of scientific data and technical expertise, and displayed in a GIS map. The three are then combined in an overall rating.

The final step of this analysis prioritizes the Forest in terms of critical fire danger areas based on the hazard, risk and value ratings and management needs. These priorities align with the *National Fire Plan* and the cohesive strategy and will guide resource management considerations on the Forest, such as natural fuels project priorities and identification of essential road access for protection purposes. The national priorities are wildland-urban interface, readily accessible municipal watersheds, threatened and endangered species habitat, and maintenance of existing low risk Condition Class I areas.

The goals related to fire management within the STNF, pursuant to the Shasta-Trinity Fire Management Plan (STNF 2001), are as follows:

- Restore fire to its natural role in the ecosystem when establishing the desired future condition of the landscape.
- Achieve a balance of fire suppression capability and fuels management investments that are cost effective and able to meet ecosystem objectives and protection capabilities.
- Prepare Fire Management Plans that will consider and define the circumstances to use in confine, contain, and control suppression strategies.
- Wildfire suppression tactics will favor the use of natural barriers, topography or watercourse, and low impact techniques. After fires are declared out, take appropriate actions to rehabilitate and/or restore the site.
- Locate incident bases and staging areas outside of wilderness. When necessary, within a wilderness, use small (50-60 people) suppression camps in areas where degradation of water quality can be avoided. Return sites to a pre-use condition.
- Permit heliports when approved by the Forest Supervisor. Use natural openings to the extent possible.

To meet those goals, fire management direction in the *Shasta-Trinity Land & Resource Management Plan* states:

- Wildland fires will receive an appropriate suppression response that may range from confinement to control. Unless a different response is authorized in this plan or subsequent approved plans, all suppression response will have an objective of control.
- All wildland fires, on or threatening private land protected by agreement with the State of California, will receive a control suppression response.
- Activity fuels that remain after meeting wildlife, riparian, soil, and other environmental needs, will be considered surplus and a potential fire hazard. The amount and method of disposal will be determined in the ecosystem analysis, a project level decision.
- Plan and implement fuels treatments emphasizing those treatments that will replicate fire's natural role in the ecosystem.
- Natural fuels will be treated in the following order of priority: 1) public safety; 2) high investment situations (structural improvements, power lines, plantations, etc.); 3) known high fire occurrence areas; 4) coordinated resource benefits, i.e., ecosystem maintenance for natural fire regimes.
- Consider fuelbreak construction investments when they complement forest health/biomass reduction needs, when very high and extensive resource values are at risk, and to protect forest communities.
- Design fire prevention efforts to minimize human-caused wildfires commensurate with the resource values-at-risk.
- Assess brush fields (chaparral) for multi-resource management opportunities, and develop project plans for treatment. Selection of the treatment methods used will be guided by the following criteria:

    1) The effectiveness of producing multi-resource benefits through modification of the specific vegetation associations;
    2) The cost effectiveness of the project;
    3) The degree of fire protection provided by conversion;
    4) The risk in watersheds; and
    5) The natural fire regime

BUREAU OF LAND MANAGEMENT (BLM)

The Redding BLM office has entered into a Cooperative Fire Protective Agreement with the California Department of Forestry and Fire Protection (CAL FIRE), where CAL FIRE is active in wildland fire protection on BLM lands. The BLM Fire Management Officer is responsible and accountable for providing leadership for the BLM fire and aviation management program at the local level.

All BLM lands with burnable vegetation must have an approved Fire Management Plan (FMP), a strategic plan that defines a program to manage the wildland and prescribed fires based on the area's approved land management plan (U. S. Department of Interior, U.S. Department of Agriculture, 2002). The FMP provides for firefighter and public safety; includes fire management strategies, tactics, and alternatives; addresses values to be protected and public health issues; and is consistent with resource management objectives, activities of the area and environmental laws and regulations. Until an FMP is approved, BLM units must take an aggressive suppression action on all wildland fires consistent with firefighter safety and public safety and resources to be protected.

A majority of the BLM parcels within the watershed have been designated as 'transfer parcels,' which means the parcels are eligible for exchange with other federal or private landowners as a means to consolidate BLM's ownership in other areas. The remaining BLM parcels will be maintained as part of BLM's ownership and be managed as sensitive areas. Sensitive areas have been established by BLM in response to the potential Wild and Scenic Rivers designation that may be imposed on watershed creeks in Shasta County. To protect the potential for designation, no mechanized equipment is allowed within the sensitive areas.

Fuels management on these lands is guided by the Bureau of Land Management, Redding Field Office, *Fire Management Plan* (Dec. 2004). This plan is a general guide that covers all facets of fire management. Specific to fuels management, it sets objectives for focusing work on the WUI and recognized Communities at Risk, and identifies a range of treatment options that could be utilized, consisting of prescribed fire along with non-fire fuels treatments (mechanical, chemical and biological). Targets are to treat 1/100 to 1/50 of the land base every ten years with prescribed fire and to treat 3/100 to 3/50 of the land base every ten years with a non-fire fuels treatment.

BLM strategically focuses fuel treatment activities by placing priorities on areas where actions will mitigate threats to the safety of employees and the public, areas were actions will protect, enhance, restore and/or maintain plant communities and habitats that are critical for endangered, threatened or sensitive plant and animal species, and areas where actions will reduce risks and damage from a wildfire.

Although structural fire suppression is the responsibility of tribal, state or local governments, BLM may assist with exterior structural protection activities under a formal agreement with CAL FIRE (as of 2003, CAL FIRE is under contract to provide fire protection to BLM lands). There are three categories of structures: those not threatened; those threatened; those lost or too dangerous to protect. In the wildland-urban interface, BLM lists several "Watch Outs" that assist personnel in sizing up a wildfire situation. These Watch Outs may be beneficial to readers of this report in assessing the fire-safe condition of personal property. Watch Out for:

- Wooden construction and wood shake roofs
- Poor access and narrow one-way canyons
- Bridge weight and size limits when using heavy equipment
- Inadequate water supply
- Natural fuels 30' or closer to structures
- Evacuations of public, livestock, pets, animals (planned or occurring)

- Power lines and poles overhead and fallen lines
- Propane and above-ground fuel tanks with nearby vegetation or wooden improvements
- Local citizens attempting suppression actions
- Level of coordination with multiple agencies

D. NATIONAL PARK SERVICE

The National Park Service, a bureau of the U.S. Department of the Interior, manages the national parks and preserves natural and cultural resources for future generations. Shasta County has the Whiskeytown National Recreation Area which is managed by the National Park Service.

WHISKEYTOWN NATIONAL RECREATION AREA (WNRA)

The upper reaches of the Lower Clear Creek Watershed lie within the WNRA, as does the lower reaches of the Upper Clear Creek Watershed, the western edge of Shasta West, and the head of the North Fork of Cottonwood Creek. With its mountainous back country and large, man-made reservoir, the WNRA offers many summer activities such as hiking and boating, as well as historical remains of the California Gold Rush of 1849. Whiskeytown Lake provides 36 miles of shoreline and 3,200 surface acres of water, and is excellent for most water-related activities, including swimming, scuba diving, water skiing, boating and fishing. The lake was created by diverting water through tunnels and penstocks from the Trinity River Basin to the Sacramento River Basin. The most prominent landmark within the Recreation Area is Shasta Bally (elevation 6,209 feet). The summit may be reached on foot and by 4-wheel drive vehicle, but is closed in the winter. Picnicking, hiking, hunting, interpretive programs and horseback riding are also popular within the Whiskeytown Unit.

The WNRA has the Whiskeytown Fire Management Plan and a goal relating to fuels management. To achieve the objectives of the WNRA fire management program, the area has been declared a fire suppression zone. All lightning and human-caused wildfires originating from or threatening the area will be suppressed (confined, contained, controlled, or a combination). Mechanical fuel manipulation and management-ignited prescribed fires may be used to reduce fuels and maintain vegetative mosaics and wildlife habitats that approximate natural conditions and ecosystem processes within the area.

The *Whiskeytown Fire Management Plan* has a specific goal relating to fuels management: reduce hazard fuels adjacent to developed areas, urban interface boundaries, and cultural/historical sites.

The *Whiskeytown Resource Management Plan* provides three management objectives which relate to fire management:

- Protect the diversity of natural ecosystems, which are found within the Whiskeytown Unit.

- Restore and maintain natural processes in areas of Whiskeytown affected by past and present human-caused impacts.
- Reduce hazardous fuel accumulations throughout Whiskeytown through the use of ecologically sound techniques, and restore fire to the ecosystem through prescribed fire.

The five-year objective is to reduce hazard fuels in developed areas, urban interface boundaries, and cultural/historic zones to a level where at 90th percentile weather conditions, average flame lengths would be four feet or less. The desired outcome is that the fuel conditions in strategic areas adjacent to urban interface boundaries, developed areas, and cultural/historic sites are maintained at a level such that the values-at-risk are adequately protected from wildland fire.

Strategies to attain this are:

- Establish shaded fuelbreaks based on fire risk and maintain existing fuelbreaks as needed.
- Use mechanical treatments to reduce hazard fuels in areas directly adjacent to Whiskeytown facilities and inholdings.
- Use prescribed fire and mechanized hazard fuel reduction in strategic urban interface boundary areas to reduce the threat of wildland fire spreading outside the boundaries of Whiskeytown.
- Apply mechanical hazard fuel reduction adjacent to targeted significant cultural and historic sites to protect from fire damage.
- Monitor the effects of prescribed fire and mechanical fuel reduction treatments so that their effectiveness and resource impacts are identified and incorporated into future planning.

E. FIRE SAFE COUNCILS

Formed in 1993, the California Fire Safe Council (CFSC) encourages Californian communities to become more Fire Safe, Firewise and Fire Adapted. This effort led to the formation of Fire Safe Councils across the state as an effort to prepare for wildfires before they occur (refer to www.cafiresafecouncil.org for more information).

SHASTA COUNTY FIRE SAFE COUNCIL

The Shasta County Fire Safe Council (SCFSC) was formed in May 2002 as part of a statewide effort to educate and encourage Californians to pro-actively prepare for wildfires. The mission of the Shasta County Fire Safe Council is to be a framework for coordination, communication, and support to decrease catastrophic wildfire throughout Shasta County. The group meets as needed to discuss projects, share information, schedule speaking engagements, develop educational opportunities, and update maps showing fuels reduction projects and maintenance throughout the county. The SCFSC has a mobile education trailer used for public outreach. Recently, due to lack of funding, the SCFSC has been inactive. It is hoped to revitalize the organization in the near future.

F. INDUSTRIAL FOREST LANDOWNERS

Lands that are owned by commercial forest landowners are managed as Timber Production Zones (TPZs) and are restricted to timber production and certain compatible uses. The major private industrial forest landowners or managers in Shasta County are: Sierra Pacific Industries, Shasta Forests, Red River Forests, W.M. Beaty and Associates, Oxbow Timber LLC., Roseburg Resources, and Crane Mills. The land management objectives for these property owners may vary due to the need for different species and sizes of wood for their manufacturing facilities. The facilities owned by these companies produce a wide variety of products, such as plywood, windows, doors, framing material, decking, fencing, and much more. When it comes to protecting the forest land, their most valuable asset, from wildfire, their goals are very much the same. Industrial forest landowners are actively addressing wildfire hazards on their lands. Fuels reduction practices include the construction of fuelbreaks which also provide protection to neighboring communities and wildlands. There are stiff requirements for all contractors and employees working in the forest during fire season.

Typically, all contractors and employees permitted on private forest land are required to make every effort and take all precautions necessary to prevent fires. A sufficient supply of hand tools are maintained on a job site at all times for firefighting purposes only. Tools include shovels, axes, saws, backpack pumps, and scraping tools. Each forest worker, employee, or person permitted on private forest land is required to take immediate action to suppress and report any fire on or near the property.

On all fires, a sufficient number of people stay on a fire until it is known that adequate action has been taken by CAL FIRE or the agency taking primary responsibility for putting out the fire. All people and equipment remain until released by the agency in charge, or for a longer period, if considered necessary by the land manager.

During fire season, most companies conduct daily aerial patrols covering their forest operations and pay special attention to those areas where work is being conducted, even hours after workers have left the area. These companies may also cease operations during “red flag danger” or “high-fire danger” days.

Typically there are specific treatments detailed for care of limbs and other woody debris (often called slash) created by harvest operations in order to minimize fire hazards. It can include piling and burning slash no later than April 1 of the year following its creation, or within a specified period of time after fire season, or as justified in the associated Timber Harvest Plan. The slash and any trees knocked down by road construction or timber operations are typically lopped for fire hazard reduction, then piled and burned, chipped, buried or removed from the area. Lopping is defined as severing and spreading slash so that no part of it remains more than 30” above the ground. All woody debris created by harvest operations greater than one inch (1”) and less than eight inches (8”) in diameter within 100 feet or permanently located structures maintained for human habitation are removed or piled and burned. All slash created between 100-200 feet of permanently located structures maintained for human habitation are usually lopped.

VII. ANALYSIS OF FUEL MODELING AND FIRE CONDITIONS

A. FIRE HISTORY

An ignition analysis indicates that debris burning is a major cause of fires (CAL FIRE, *Shasta-Trinity Unit Strategic Fire Plan*, 2015). Other leading causes include equipment use, lightning, vehicle, arson, and miscellaneous (identified ignition does not fit other cause classes). The ongoing drought contributes to the increase in fires due to drier than normal fuel conditions. Fires also may start along railroad tracks since a major freight and passenger railroad line runs north-south parallel to Interstate 5 through the western portion of the county.

CAL FIRE and USFS maintain databases on fires within and around their Forest Protection Zones (FPZ). The CAL FIRE database also includes fires recorded within the NPS FPZ. Both databases include the year of fire start, large fires, and total fire acreage, but cause of fire is included only on CAL FIRE fire start data and USFS large fire data.

TABLE 3
RECENT MAJOR FIRES IN SHASTA COUNTY [1]

Fire	Year	Acres Burned
Bald	2014	39,736
Bully	2014	12,661
Eiler	2014	32,416
Gulch	2014	1,375
Clover	2013	8,073
Bagley	2012	46,011
Coal[2]	2012	241
Dale	2012	1,038
Ponderosa	2012	27,676
Reading	2012	28,079
Salt Creek	2012	980
Ward	2012	550
Sugarloaf	2009	9,350
Noble	2008	12,856
Shasta-Trinity Lightning Complex	2008[3]	86,500
Bear	2004	10,484
Jones	1999[4]	26,200
Total Acres Burned		**344,228**

[1] Recent major fires between 2004-2014. Data obtained from CAL FIRE Archived Fires.
[2] Coal Fire (September 2012) was adjacent to the Salt Fire (August 2012).
[3] The fire season of 2008 was exceptionally disastrous due to drought conditions. This complex included the Motion Fire (28,330 acres) and the Moon Fire (35,312 acres)
[4] Jones Fire (1999) area was burned multiple times with the Bear Fire (2004) and Gulch Fire (2014).

Shasta County has experienced several major fires in the last 30 years, plus numerous smaller fires each year that were caught in initial stages by aggressive fire suppression or otherwise restrained by less than perfect fire weather conditions. Some of the largest fires within the decade were the 2008 Shasta-Trinity Lightning Complex Fire at 86,500 acres, the 2012 Bagley Fire at 46,011 acres, the 2014 Eiler Fire at 32,416 acres, and the 2012 Ponderosa Fire at 27,676 acres. Shasta County has two fires listed on CAL FIRE's 20 most damaging incidents: the 1992 Fountain Fire at 63,960 acres and 636 structures, and the 1999 Jones Fire at 26,200 acres and 954 structures. Other notable fires in Shasta County in the last two decades are: the 1999 Canyon Fire near Happy Valley burned 2,580 acres; and the 2004 French Fire burned 12,675 acres. These fires were wind driven events, resulting in extreme fire behavior and great property and timber losses.

In summary, with heavy fuel loading, hot temperatures, critically low humidity, and strong north winds, a major wildfire potential exists in Shasta County.

Figure 8. The Fountain Fire (1992) burned 63,960 acres.

B. FUEL, WEATHER AND TOPOGRAPHY

The three major components of the Wildland Fire Environment are fuels, weather, and topography (National Wildland Coordination Group, 1994). Weather is a major factor and local weather conditions are important in predicting how a fire will behave. The recent trend of drought conditions have significantly increased the risk of catastrophic wildfires in California.

Fuel factors that influence fire behavior are fuel moisture, fuel loading, size, compactness, horizontal continuity, vertical continuity, and chemical content. (National Wildfire Coordinating Group 1994) All of these factors will influence the quantity of heat delivered, the duration, flame length and the rate of spread of any given fire, and should be considered prior to considering pre-fire projects or initiating fire suppression activities.

- Fuel moisture is the amount of water in a fuel, expressed as a percentage of the ovendry weight of that fuel. For example, a fuel sample can be found to have 20-60% moisture content. Moisture content can range from as low as 5 % to a high of 260+%.
- Fuel loading is defined as the ovendry weight of fuels in a given area, usually expressed in bone dry tons. For example, an area can be calculated to have 20 bone dry tons per acre of fuel. A bone dry ton is 2000 pounds of vegetation when rated at 0% moisture content.
- Size refers to the dimension of fuels, and compactness refers to the spacing between fuel particles.
- Continuity is defined as the proximity of fuels to each other, vertically or horizontally, that governs of the fire's capability to sustain itself.
- Chemical content in fuels can either retard or increase the rate of combustion.

Figure 9. A rural home in the WUI

Within the lower elevations the wind blows from the north during the early part of the summer and from the south during the latter part of the summer, and in the western foothills, the wind patterns push up the canyons on the hillsides east to west. In the valley the wind patterns push wildfires in a northerly or southerly direction and westerly direction in the foothills. From a strategic standpoint, fire spread in lower elevations can most likely be decreased by an east-west oriented fuelbreak or area to set up control lines. To hold valley fires from being pulled up through 'chimneys' in the canyons of the foothills, strategically placed fuel breaks near the foothills oriented in a north-south direction can help.

During the fire season (June-October), daily temperature is usually in excess of 90° Fahrenheit and relative humidity is typically less than 30%. When combined, these conditions create an extreme fire danger during the summer months; therefore, fuels management activities are typically conducted during late fall, winter and early spring.

Topography can affect the direction and the rate of fire spread. Topographic factors important to fire behavior are elevation, aspect, steepness, and shape of the slope. When fire crews are considering fire suppression methods, the topography is always critical in determining the safest and most effective plan of attack. When accessible, ridge lines are very important features from which to conduct fire management activities and can be a strategic area to conduct fuels management activities. All of these factors will influence the quantity of heat delivered, the duration, flame length, and the rate of spread of any given fire, and should be considered prior to considering fire prevention projects or initiating fire management activities.

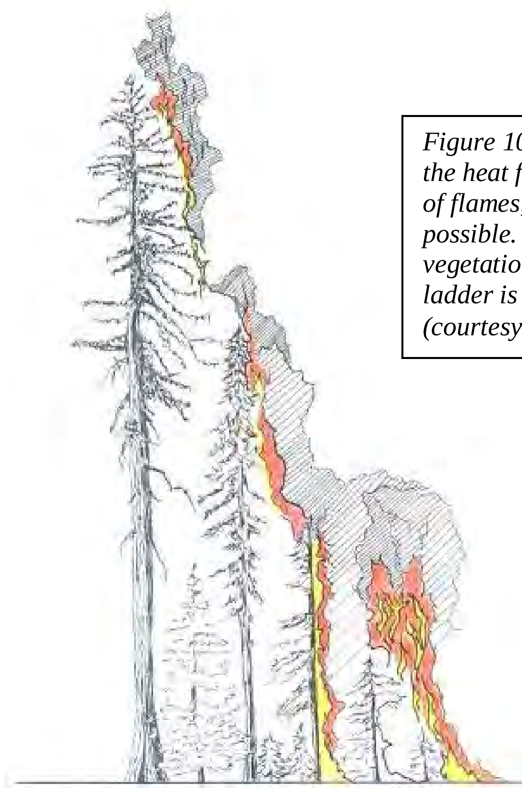

Figure 10. Example of a fuel ladder. Due to the heat from a fires and the upward motion of flames, fires will burn upward if at all possible. This pertains to slope of land or to vegetation layers. The concept of a fuel ladder is shown in the diagram to the left (courtesy of: http://www.fs.fed.us)

C. FUEL MODELS

In the summer of 1997, the Western Shasta Resource Conservation District, Bureau of Reclamation, Bureau of Land Management, and CAL FIRE conducted a fuel inventory of the planning area. The goal of the fuel inventory is to identify high fuel-loading areas and collect data that could be used as a tool to plan fire protection activities.

Fuels are made up of the various components of vegetation, live and dead, that occur on a given site. Fuels have been classified into four groups: grasses, shrub/brush, timber, and slash. The differences in fire behavior among these groups are basically related to the fuel load and its distribution among the fuel diameter-size class. In 1972, thirteen mathematical fire behavior models or Fuel Models were developed by Rothermel (1972) to be utilized in fire behavior predictions and applications for every vegetation type. These Fuel Models represent the types of fuel most likely to support a wildfire, and were identified based on the publication “Aids to Determining Fuel Models for Estimating Fire Behavior” by Anderson, 1982.

The fuel models were designed to estimate fire behavior during severe fire hazard conditions when wildfires pose greater control problems and severely impact natural resources. Fuel models are simply tools to help the user realistically estimate fire behavior. The criteria for choosing a fuel model includes the assumption that fire burns in the fuel stratum best conditioned to support the fire. This means that situations will occur where one fuel model will represent the rate of spread most accurately, while another best depicts fire intensity. In other situations, two different fuel conditions may exist, so the spread of fire across the area must be weighed by the fraction of the area occupied by each fuel type.

The following table illustrates the fuel models, and the vegetation types or land types in the watershed:

TABLE 4: FUEL MODEL TYPES

Fuel Model	Fuel Complex
	Grass and Grass-Dominated
1	Short Grass (1 foot)
2	Timber (grass and understory)
3	Tall Grass (2.5 feet)
	Chaparral and shrub fields
4	Chaparral (6 feet)
5	Brush (2 feet)
6	Dormant brush, hardwood slash
7	Southern rough
	Timber litter
8	Closed timber litter (short needle)
9	Hardwood litter (long needle)
10	Timber (litter and understory; greater than 3 inches)
	Slash
11	Light logging slash
12	Medium logging slash
13	Heavy logging slash
	Other
	Agriculture
	Riparian vegetation
	Serpentine vegetation
	Barren rock
	Water bodies
14	Urban development

VIII. FUEL TREATMENTS

Reducing fuel loads is one of the most effective elements of any fire prevention and protection program. Although fire is an integral component of the ecosystem of Shasta County, managing fire by managing fuel loading is critical to maintaining communities, ranches, grazing lands, riparian areas, and the overall health and function of the watershed. The ability to implement fuels reduction projects typically comes down to the source of funds available, the cost of labor, the permitting process to implement the project, and landowner cooperation.

A. PRESCRIBED BURNING

Prescribed fire is used to approximate the natural vegetative disturbance of periodic wildfire occurrence. This vegetative management tool is used to maintain fire dependent ecosystems and restore those outside their natural balance. Generally, low intensity prescribed fire is applied by trained experts to clear ground of dangerous fuels like dead wood and brush. This low-intensity fire is vital to the life cycles of fire-dependent range and forest lands.

Other advantages of prescribed fire include the low cost of implementation, implementation over a large area at once, and decreased herbicide use by controlling the timing of sprouting. Some of the negative aspects of prescribed fire include the potential for erosion, the smoke created, the limited time frame to implement, the risk of escape, and non-feasibility in small areas.

Most prescribed fires are lit by crews using a drip torch, a hand-carried device that pours out a small stream of burning fuel. Other fires or burns are ignited by helicopters carrying a gelled fuel torch (helitorch) or a sphere dispenser machine that drops material to ignite the surface fuels in forest and range types. Exactly how each unit is ignited depends on weather, the lay of the land, and the intensity of the fire needed to meet the goal of the burn (USDA Forest Service 2002). The technique can be used to burn piles of cut brush or grass over a designated prepared area (broadcast burn).

Prescribed fire is useful in restoring and maintaining natural fire regimes in wildland areas, but logistic and social concerns have been constraints on widespread deployment. Because of such conflicts, resource managers often employ mechanical fuel reduction, such as thinning, in conjunction with prescribed fire to reduce fuels and the fire hazard (Regents of the University of California 1996) (CAL FIRE 2002).

Prescribed fire is an option when this risk can be reduced to manageable levels. Factors closely monitored to mitigate risk include:

- Fuel moisture content
- Ratio of dead-to-live fuel
- Fuel volume
- Size and arrangement of fuel
- Percentage of volatile extractives
- Wind speed and direction
- Relative humidity
- Air temperature
- Topography

A successful prescribed burn must account for all these factors to prevent the fire from going out of control. Guidelines for measuring the data and selecting the levels necessary to manage the prescribed fire are available from a variety of sources. One excellent reference for wildland-urban zones is the USDA Forest Service publication, *Burning by Prescription in Chaparral* (USDA Forest Service 1981).

Air quality is another consideration when considering the use of prescribed burning. Communities in the Wildland-Urban Interface are very sensitive to the presence of smoke. Burn days approved by state and local authorities take into consideration the meteorological effects on both fire severity and smoke dispersion. In the case of chaparral, prescribed burning for range improvement has been practiced by California landowners under permit from the California Department of Forestry and Fire Protection (CAL FIRE) since 1945 (Green 1981). Currently, procedures for prescribed burning require a written plan for each burn. A plan includes such items as an objective, an area map, a description of the burn unit and surrounding areas, a smoke management plan, and the burn prescription (USDA Forest Service 1981).

Prescribed fire is the primary treatment method for all public lands, ranging from USDA Forest Service land to state parks. According to FRAP, the *Forest and Rangeland Resources Assessment Program* (Regents of the University of California 1996), most prescribed burns were to control brush, especially chaparral. Public agencies feel prescribed burns offer the lowest cost solution when considering the scale of the area requiring treatment. However, prescribed fires can be expensive when the true cost of planning, data gathering, reporting, and control and suppression are considered. Other major constraints are the reduction in allowable burn days because of increasing air quality concerns, high fuel load levels found in many forested and urban-wildland areas, and the increased production of pollutants, such as carbon monoxide, nitrous oxide, and particulates. In these situations, a combination of mechanical methods of fuel reduction combined with prescribed fire may provide the best solution.

B. SHADED FUELBREAKS

Shaded fuelbreaks are constructed to create a defensible space in which firefighters can conduct relatively safe fire management activities. Fuelbreaks may also slow the progress of a wildfire enough to allow supplemental attack by firefighters. The main idea behind fuelbreak construction is to break up fuel continuity to prevent a fire from reaching the treetops where it becomes explosive, thus keeping the fire to stay on the ground where it can be more easily and safely extinguished. The fuelbreak also slows down a wildfire and often the fire drops to the ground where the only fuel available thereby making the fire easier to extinguish. Fuelbreaks may also be utilized to replace flammable vegetation with less flammable vegetation that burns less intensely. A well-designed shaded fuelbreak also provides an aesthetic setting for people and a desirable habitat for wildlife, in addition to fuels reduction. The typical minimum width of a shaded fuelbreak is 100 feet, but can be up to 300’ wide. The appropriate width is highly dependent on the slope, fuel density, fuel type, fuel arrangement, and landowner cooperation.

The California Board of Forestry has addressed the needs to strengthen community fire defense systems, improve forest health, and provide environmental protection. Their rules allow a Registered Professional Forester (RPF) to use a special silviculture prescription when constructing or maintaining a community fuelbreak, exempts community fuelbreaks from an assessment of maximum sustained production requirements and allows defensible space prescriptions to be used around structures.

The Western Shasta Resource Conservation District, through consultation with its agency partners, has adopted the following fuelbreak standards:

- The typical minimum width of a shaded fuelbreak is 100 feet, but can be up to 300' wide. The appropriate width is highly dependent on the slope, fuel density, fuel type, fuel arrangement, and landowner cooperation.
- Fuelbreaks should be easily accessible by fire crews and equipment at several points. Rapid response and the ability to staff a fire line is very important for quick containment of a wildfire.
- The edges of a fuelbreak are varied to creating a mosaic or more natural look. Where possible, fuelbreaks should complement natural or man-made barriers such as meadows, rock outcroppings, and roadways.
- A maintenance plan should be developed before construction of a fuelbreak. Although a fuelbreak can be constructed in a matter of a few weeks, maintenance must be conducted periodically to keep the fuelbreak functioning effectively.
- The establishment of a shaded fuelbreak can lead to erosion if not properly constructed. Short ground cover, such as grass, should be maintained throughout the fuelbreak to protect the soil from erosion.
- A properly treated area should consist of well-spaced vegetation with little or no ground fuels and no understory brush. Tree crowns should be approximately 10-15' apart. The area should be characterized by an abundance of open space and have a 'park like look' after treatment.

Example of a Fuelbreak

In areas where privacy is a concern, islands of brush may be left in strategic positions. CAL FIRE recommends that brush left in place be limited to islands having a diameter two times the height of the brush, and a distance three times the height of the brush between the islands. If the islands of brush are strategically placed, a homeowner can achieve a reasonable amount of defensible space, and retain the privacy most people are seeking when they move to the wildland – urban interface (WUI).

The Pile and Burn method is most commonly utilized when constructing fuelbreaks. Material is cut and piled in open areas to be burned. Burning takes place under permit on appropriate burn days. Burn rings can be raked out after cooling as a means to decrease their visual effect.

In dealing with chaparral, a relatively new technique is called “crush and burn” which combines mechanical fuels treatment with burning. It is more effective at eliminating chaparral then a low-intensity prescribed burn, which has difficulty competing with the high moisture content of live chaparral. In this method, the chaparral is mechanically crushed, then piled, and burned. It is a good technique for areas adjacent to communities and to encourage chaparral regeneration in riparian zones.

C. MECHANICAL TREATMENT

Using mechanized equipment for reducing fuels loads on suitable topography and with certain fuel types can be very effective. Using equipment to remove excess vegetation may enable the landowner to process the debris to a level where it can be marketed as a product for use in power generation; the debris then becomes labeled as “biomass” or “biofuel” as explained in the next section.

Mechanical methods to remove fuels include, but are not limited to, the utilization of bulldozers with or without brush rakes, excavators, mechanized falling machines, masticators, chippers, and grinders. Mechanical treatments conducted with a masticator grind standing brush and reduce it to shreds that are typically left on the ground as mulch. Alternatively, mechanically removed brush may also be fed into a grinder for biomass production to be burned in controlled conditions in wood-fired power plants.

A technique called “crush and burn” combines mechanical fuels treatment with on-site burning. As the name implies, the brush is mechanically crushed and then burned. Due to the higher intensity heat created in burn piles, it is more effective at eliminating brush then a low-intensity prescribed burn, which has difficulty overcoming the high moisture content of live chaparral. In addition, it is a good technique for areas adjacent to communities, because fire agencies only burn when fire danger conditions are decreased during the rainy winter months.

Mechanical treatments are also utilized on industrial and non-industrial timberlands in which trees are thinned by mechanized tree cutting or falling machines. In most cases, stands of trees are thinned from below as a means to eliminate fuels that can take a fire higher in the forest into the tree canopy (ladder fuels). However, stands of trees may also be thinned from above to eliminate crown continuity.

Mechanical treatments can be used successfully on stable ground up to 50% slope, but should only be conducted during dry periods when soils are not saturated to minimize erosion and compaction. However, mechanical treatments should not be conducted when days are hot, dry, windy and with low relative humidity. The drastic visual impacts should be considered when planning projects so that all parties are aware of how the area will look when the project is completed. Initial planning should address mitigation for erosion potential, using measures such as waterbars, ditching, and mulching in critical areas. Furthermore, the impacts on wildlife and archaeological resources and air quality must be addressed.

Mechanical treatment will usually necessitate a cultural resource survey, CEQA/NEPA documentation and compliance, a California Natural Diversity Database (CNDDB) search, and the preparation of water quality documents/permits. The cost of preparing environmental documents and mitigation measures must be figured into the budget for any projects using mechanical methods.

Due to air quality concerns, the mechanical treatment method is fast becoming the acceptable method of fuel reduction in urban interface areas. Compared to prescribed fire, mechanical treatment involves less risk, produces less air pollutants, is more aesthetically pleasing, and allows landowners to leave desirable vegetation.

D. BIOMASS ANALYSIS

For thousands of years, people have been taking advantage of the earth's vegetation, also called biomass, to meet their energy needs (www.epa.gov, 2002). Technologies for using biomass continue to improve and today biomass fuels have the potential to be converted into alternative fuels (biofuels), such as ethanol, methanol, and biodiesel. The typical use of biomass is for as boiler fuel to be used for use in industrial heating and power generation.

When used for generating electricity, biomass is typically burned to transform water into steam, which is used to a drive a turbine and attached generator (www.epa.gov, 2016). Although a majority of the biomass market is associated with energy production, biomass offers a wide verity of uses such as fiber-reinforced composites, fiber-filled thermoplastics, high performance fiberboard, cement board, mulch for landscaping and soil amenities, smoke chips for curing and flavoring meat and bio-oils which are used as asphalt additives or adhesives. Potential markets continue to be explored and developed by the private sector, and the federal government has also demonstrated interested in the biomass industry by the release of Executive Order 13134. On August 12, 1999, President Clinton released Executive Order 13134, designed to stimulate the creation and early adoption of technologies needed to make bio-based products and bioenergy cost-competitive in the large national and international markets (EO 13134, 1999). Environmental and energy management was revisited on January 24, 2007 with Executive Order 13423 (EO 13423, 2007).

The utilization and development of biomass technology offers many economic and socioeconomic benefits. However, one of the most widely acknowledged benefits is the potential development and utilization of biofuels as a means to reduce the world's dependency on non-renewable fossil fuels. Presently, a majority of the electricity in the

U.S. is generated by burning fossil fuels such as coal, natural gas, and oil. On the local level, the development of biotechnology also offers both economic and socioeconomic benefits.

Shasta County contains thousands of acres of forestland, which produce a substantial amount of renewable biomass each year. The biomass market associated with wood products production has been long developed, and biomass harvesting for fuel reduction has been a common practice within managed forestlands in Northern California. Biomass production, since the late 1980's, not only provides economic support at the local, state, and federal levels but also reduces the nation's dependency of fossil fuels. The watershed also contains thousands of acres of chaparral, which produce a significant amount of renewable biomass, and although only a small portion of the biomass produced from chaparral landscapes is utilized for biomass.

The potential for biomass production within Shasta County is good given that its watersheds contain a substantial amount of raw material (chaparral and forestland species). In addition, a 58-megawatt wood-fired power plant, Wheelabrator Shasta Energy, in Anderson, which processes 1,250 tons of biomass each day to produce electricity is within the county boundary (www.wtienergy.com, 2016).

The feasibility of any biomass operation depends on the market price of biomass, also commonly called hogged fuel or hog fuel (if it is processed through a hammer hog), the density, or amount of fuel on the ground, and transportation costs. Processing can include harvesting and chipping or hogging and costs are directly correlated with the species, age, size, moisture, and density of the vegetation being processed as well as the topography of the area. The transportation cost from the project area to the nearest wood fired power plant is directly related to the size of the transport van, moisture content of the fuel, time needed for loading biomass, the road bed system, and distance to the plant.

The price a power plant is willing to pay for a ton of biomass vs. the processing and transportation determines the economic feasibility of an operation. However, the value of fuel reduction to the landowner is a real value and should be considered in this calculation to determine the true feasibility of a biomass operation.

Harvesting is usually accomplished with an excavator and/or a bulldozer tractor which is utilized to remove and pile the brush. Processing can be accomplished with a hammer hog, tub grinder, drum chipper or some other type of industrial type chipper fed by the excavator or other mechanical means.

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Biomass collection in action.
Tub grinder on right, conveyor moves
biomass into the van.

Pursuant to the California Forest Practice Rules, if biomass operations involve the harvest of commercial species, the project requires a permit issued by the California Department of Forestry and Fire Protection. Biomass operations which do not involve the harvest of commercial species are not subject to the California Forest Practice Rules, but may require county permits or other agency review depending on the physical characteristics of the project area. A Registered Professional Forester (RPF) should be involved prior to commencement of any biomass operation in order to determine what permits might be required and to estimate the cost and timing of obtaining the permits.

Although the biomass industry is the most developed biomass market in northern California, other markets are currently in the developmental stage and may become a commercially viable option for biofuel products in the future. These markets are far from becoming a significant force in the market place but may provide alternative utilization methods and future marketing opportunities.

E. MAINTENANCE TREATMENT

Maintenance plans for all existing shaded fuelbreaks, as well as a maintenance strategy for all planned shaded fuelbreaks needs to be formulated as soon as funding can be made available. A maintenance section should be added to all planned shaded fuelbreaks. Scrub oak re-sprouts and manzanita seedlings on disturbed areas are typical of the vegetation needing control. Control can take many forms including chemical control, mechanical control, or grazing by livestock (such as goats).

The time frame for maintenance is typically two years, five years, and ten years after initial construction of the shaded fuelbreak. Treatment with livestock would need to be repeated more frequently.

Shade is another method for controlling the re-growth of vegetation. The shade in shaded fuel breaks is a two-fold benefit. Not only does it make the fuelbreak more aesthetically palatable, the shade also limits the re-growth of shade intolerant species like manzanita and toyon.

Periodic maintenance of a fuelbreak sustains its effectiveness. Seeding the fuelbreak with annual grass cover immediately following its construction will help reduce brush and conifer invasion, but only depending on grass cover will not eliminate invading plants for an extended period of time. There are several methods to maintain fuelbreaks.

1. Herbicides

The use of herbicides is a very effective method of eliminating unwanted vegetation, but there are many restrictions. Some herbicides are species specific, which means they can be used to eliminate brush species and will not harm grass species. Manual treatment is also a very effective means to eliminate invading vegetation, but is very labor intensive. The cost of fuelbreak maintenance must be balanced with its degree of effectiveness. The recommended rotation time to control sprouting regrowth and encourage the maintenance of ground cover by prescribed burning is 4 to 7 years (Schimke and Green, 1970).

2. Dozer Lines

The use of dozer/disc trails parallel to roadways is a common method to create a firebreak for ranchers in the north state. The firebreak is normally scraped, dug, bladed, or disked to mineral soil and provides a control point from which firefighters can work. Dozer lines are not aesthetically pleasing, but are very effective on ranches.

3. Herbivores

Herbivore (goat) grazing may be used as a means of maintaining fuelbreaks, since goats would rather eat brush and weeds than grass. Browse makes up about 60% of a goat's diet, but only about 10-15% of a cow's diet.

Goats used for fuel load reduction are managed to remove dense understory, including brush, shrubs, forbs, and lower branches to remove ladder fuels. It may require giving goats supplements of protein or energy, depending on the class of goats used and the time of year. The choice must be balanced on the type of soil, vegetation, and livestock analysis. Eliminating the ladder fuels helps prevent soil erosion and enhances rainfall infiltration. Monitoring of the herbivore grazing is critical since over-grazing can lead to erosion.

As goats work through an area they are also working on the understory, old pine needles and leaves, breaking lower branches, and splitting apart old downed branch material. Once an area has been "brushed" by goats, it can be maintained as a living green belt. Fire control or containment with goats takes coordination of the stock owner, land steward, local fire patrol, professional fire abatement teams, CAL FIRE, DFG, and others.

According to a report published by the North Carolina Cooperative Extension Service, grazing goats have been observed: to select grass over clover; prefer browsing over grazing pastures; prefer foraging on rough and steep land than over flat, smooth land; graze along fence lines before grazing the center of a pasture; and graze the top of the pasture canopy fairly uniformly before grazing close to the soil level.

Herbivore grazing has been done in the Sierra Foothills by various organizations. Before entering a new area, they develop a landscape goal, complete a vegetative survey, and identify toxic plants. They identify the growth habit and adaptation of each plant species, especially those that are toxic.

The objective is to control the invasion of unwanted species and encourage perennial grasses to return. In a report published by Langston University, goats improve the cycling of plant nutrients sequestered in brush and weeds, enabling the reestablishment of grassy species. Portable electric fencing is used to control the goats' foraging area.

Herbivores used in fuel reduction

A rough guideline for the cost of using goats for maintenance of a fuelbreak is about $1.00 per goat per day. One hundred animals will remove fuel from about 1/4 acre per day. If the area is more than a few acres, the cost usually includes the goats, portable fencing, a goat herder, water and all transportation and daily supervision.

4. Converting Brush Land to Oak Woodland

Brush land usually occurs on soils that are best suited for growing brush. Soils are sloping to very steep loams and are stony or rocky. These soils are usually shallow to bedrock, and available water capacity is low or very low. Vegetation is generally chaparral, but can include such species as chamise, Lemon's ceanothus, buckbrush, toyon, poison-oak, whiteleaf manzanita, and western mountain mahogany. There are few trees occurring on the sites, such as interior live oak and gray pine. At least 80 percent of the surface cover is woody vegetation.

Conversion from brushland to oak woodland will entail a thorough investigation of the site. Soil depth, type, aspect, and exposure will all determine the success or failure of an attempted conversion. With few exceptions, most of the brushy sites are naturally occurring, and represent the native vegetative community.

Natural regeneration of oak species is very difficult to accomplish. A conversion from brush to oak woodland should begin with a thorough investigation of the capability of the site to support oak trees. The second, or next step, should be to secure a reliable source of oak seedlings; and the third step should be to develop a planting plan. A realistic cost estimate should be the fourth step. All this should be accomplished before the existing brush cover is removed.

IX. ROADS FOR ACCESS

Roads are an essential part of any fire and fuels management plan, providing the principal access to the communities, homes, and wild places in the watershed. Additionally, roads may offer a defensible space from which firefighters can conduct direct attack on wildfires and also provide strategic locations for roadside fuelbreaks. Roadside fuelbreaks not only provide defensible space for firefighters, but also a safe escape route for residents in the event of a wildfire.

Though all roads are important for providing fire protection access, this plan will not attempt to identify and map all paved or improved roads. Roads that are vital to future projects will be included in treatment options. Many private ranch or forest roads are unpaved and/or gated and locked, so access to these areas will require entry permissions.

X. POTENTIAL FUNDING SOURCES

The following table lists various cost share programs.

FUNDING SOURCES AND COST SHARE PROGRAMS

Program	Goals	Services	Will Fund	Agency	Who	Limitations
State Responsibility Area (SRA) Fire Prevention Fund	Fire prevention projects and activities within the SRA	Hazardous fuel reduction, fire prevention planning and education.	Varies each cycle; match is encouraged	CAL FIRE	Local government agencies, Fire Safe Councils, non-profits, tribes	Must be within the SRA
Wildland Urban Interface (WUI) Grant Program	Restoring resilient landscapes, fire adapted communities, and response to wildland fires	Fuels reduction, risk mitigation or implementation of Firewise practices	50/50 match up to posted amount	USDA Forest Service	State forestry organizations	50/50 non-federal match requirement
Emergency Watershed Protection	Helps safeguard people and property following natural disasters	Technical and financial assistance	Up to 75%	NRCS	Public agencies, non-profits, community groups	25% cost share. Must obtain necessary permits

Program	Goals	Services	Will Fund	Agency	Who	Limitations
Environmental Quality Incentives Program	To address significant natural resource needs and objectives	Cost sharing, technical and educational assistance	Up to 75% set by local working group	NRCS, FSA	Agricultural producers having significant natural resource needs	Approved practices up to $10,000/producer/year. Must have Conservation Plan approved by RCD.
Forest Stewardship Program	Assist California communities to manage their watershed resources to keep forests and associated resources productive and healthy	Technical, educational and financial assistance	Cost share up to $50,000. 100% match is required.	CAL FIRE	RCDs, RC&Ds, special districts, Indian tribes, and community non-profits.	Required to comply with CEQA. Projects must be on NIPF land & address: pre-fire fuels mgmt, forest & woodland health, water quality, or wildlife & fisheries habitat.
Hazard Mitigation Grant Program	Hazard mitigation to reduce risk from future disasters	Cost share	Up to 75%	FEMA	Agencies, governments, non-profits, tribes	Federal Disaster Areas
Vegetation Management Program	Provide incentives to use fire as a tool to control unwanted brush and vegetation, which create wildfire hazards.	Covers liability, conducts prescribed burn	Up to 90% cost share	CAL FIRE	Landowners, individual or group	Agreement to sign, plan required
California Forest Improvement Program	Forestry, watershed and riparian protection and enhancement	Reforestation, land conservation, and fish & wildlife habitat	75% up to $30,000, up to 90% rehab after natural disaster	CAL FIRE	Landowners	Plan (can be cost shared) required, from 20 to 5,000 acres of forestland

Additional funding sources include:

- CAL FIRE Greenhouse Gas Reduction Fund and the Air Resources Board Cap-and-Trade Program Auction
- California Fire Safe Council Clearinghouse, fuel reduction project grant funding
- USDA Forest Service State Fire Assistance (SFA)
- Shasta County Regional Advisory Committee, Title II Funds, Secure Rural Schools and Community Self-Determination Act of 2000
- Bureau of Land Management (BLM) Community Assistance
- National Park Service (NPS) Community Assistance/WUI
- U.S. Fish and Wildlife Service (USFWS) Wildland-Urban Interface Grant Program
- California Department of Conservation, RCD Assistance Program
- Federal Emergency Management Agency (FEMA)

XI. FUELBREAK MAINTENANCE FUNDING AND LEGISLATION

Since grant funds are often obtained only to construct the fuelbreak, maintenance efforts are often left to the landowner. Unfortunately, some landowners do not have the physical or financial means to do maintenance. If a fuelbreak is not properly maintained in its entirety, it will not provide adequate fire protection in the long run. Therefore, in some situations it is often best for watershed groups and other conservation organizations to seek funding for maintenance as a means to better ensure fire protection for a given area. State legislation may also provide further funding for fuels reduction and maintenance projects.

Assembly Bill X1 29 was passed in 2011 to establish fire prevention fees not in excess of $150 to be charged on each structure on parcels within state responsibility areas. These collected fees would finance specified fire prevention activities once sufficient amounts were amassed.

Assembly Bill 32 (the California Global Warming Solutions Act of 2006) authorizes the collection of fees from greenhouse gas (GHG) sources in order to achieve reduced GHG emissions and address climate change. The Air Resources Board's Cap-and-Trade Program auction funds the Greenhouse Gas Reduction Fund (GGRF) for projects such as fuels reduction and forest health.

Public Resource Code 4629.3 establishes the Timber Regulation and Forest Restoration Fund as a funding source for the restoration of the state's forested lands and to promote the restoration of fisheries and wildlife habitat and improvement in water quality. PRC 4629.6 includes fuel treatment projects.

The March 20, 2002 amendment to Assembly Bill 1983 Wildland Fuel Reduction enacts the California Fuel Hazard Reduction Act, administered by the California Department of Forestry and Fire Protection (CAL FIRE) in consultation with the Department of Food and Agriculture, encourages the development of wildland fuel reduction practices. The bill establishes the Fuel Hazard Reduction Fund in the State Treasury to fund the program. The bill establishes permits the director to fund up to 90% of the cost to complete an eligible wildland fuel reduction project. The full text of the bill can be found at www.leginfo.ca.gov or leginfo.legislature.ca.gov.

In addition, many private sector programs are available. Information on private sector funding can be found at the following Internet sites:

- www.fdncenter.org
- calfire.ca.gov/foreststeward/assistance
- www.tpl.org/services/
- www.ufei.calpoly.edu/

Funding programs can assist in the development of shaded fuelbreaks, defensible space around structures, roadside fuel reduction, and community fire safe projects.

XII. REFERENCES

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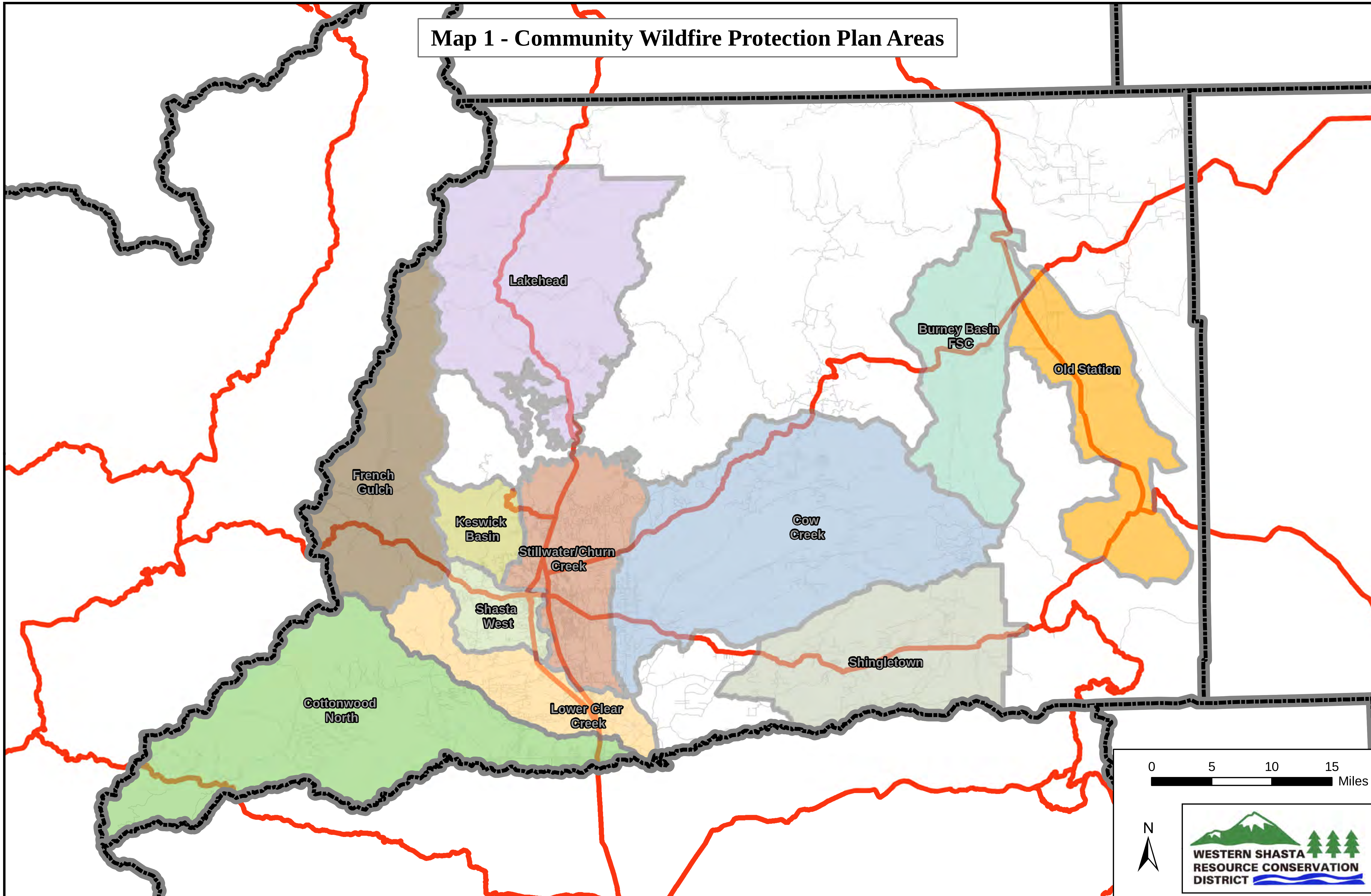
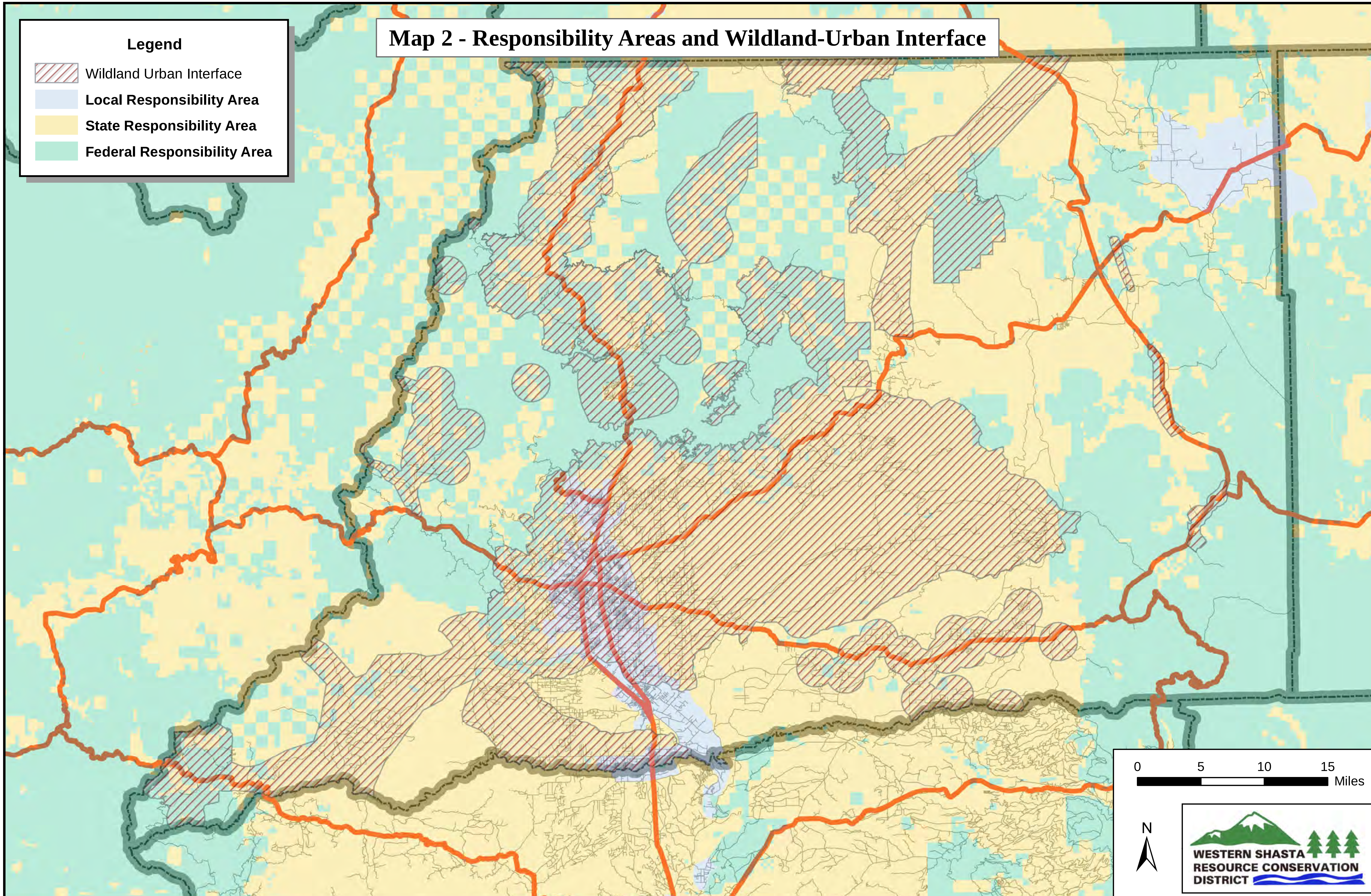
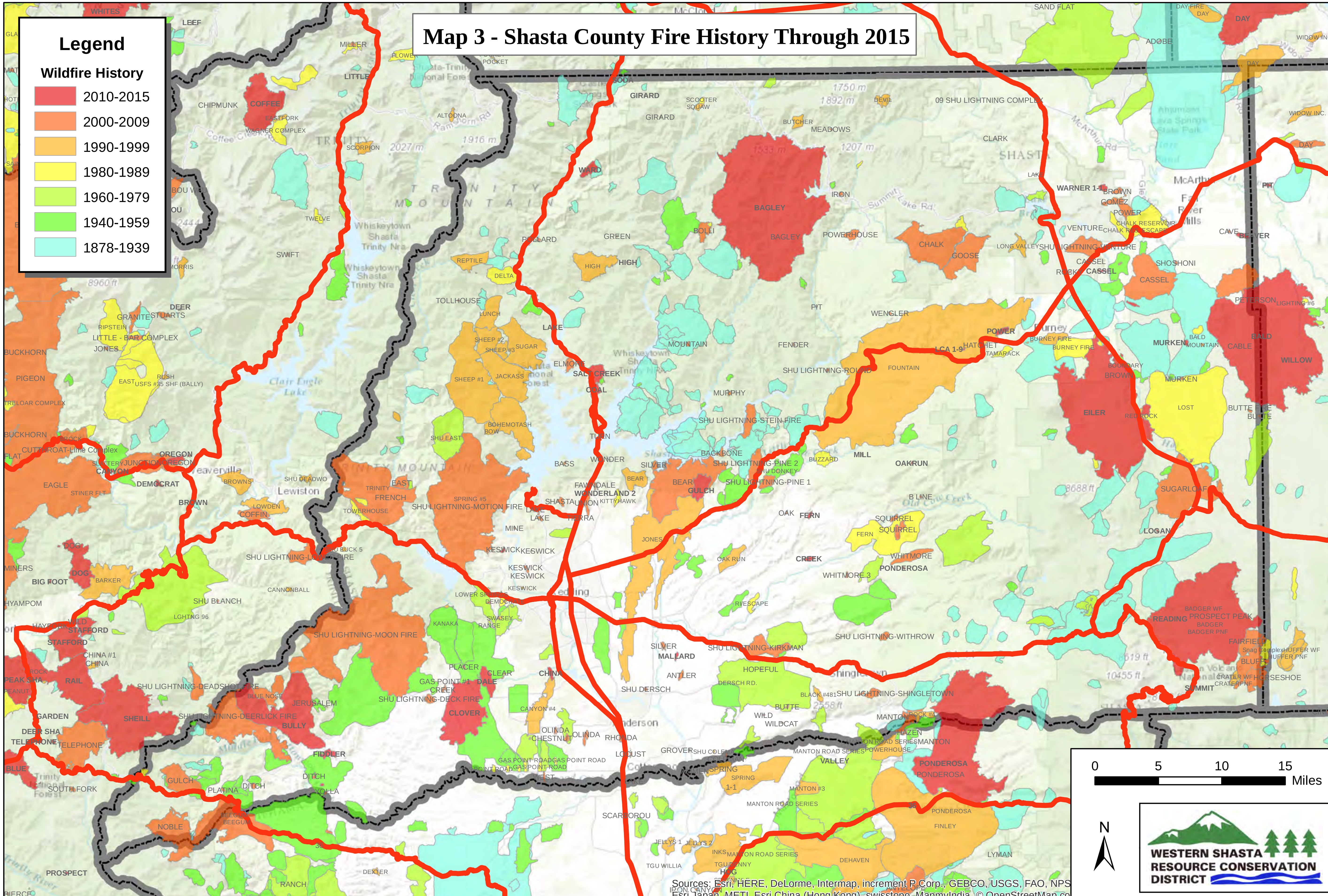
MAPS


Map 1 - Community Wildfire Protection Plan Areas
Lakehead
Burney Basin
FSC
Old Station
French
Gulch
Keswick
Basin
Stillwater/Churn
Creek
Cow
Creek
Shasta
West
Shingletown
Cottonwood
North
Lower Clear
Creek
0
5
10
15
Miles
N
WESTERN SHASTA
RESOURCE CONSERVATION
DISTRICT

Map 2 - Responsibility Areas and Wildland-Urban Interface



Map 3 - Shasta County Fire History Through 2015



PROJECT PLANNING AREAS

2016
SHASTA COUNTY
COMMUNITY WILDFIRE PROTECTION PLAN

COTTONWOOD NORTH PLANNING AREA

Covering the areas of:

- Cottonwood (northern)
- Gas Point
- Igo
- Ono
- Platina

COTTONWOOD NORTH PLANNING AREA
(2016)

I. PROPOSED PROJECTS

A. THE PLANNING AREA

The Cottonwood North planning area is located approximately 10 miles south of Redding, California on the west side of the Sacramento River in southern Shasta County. It is bordered on the north by the Anderson Creek and Lower Clear Creek watersheds, on the south by the Tehama County line (Cottonwood Creek), on the east by the Sacramento River, and on the west by the Trinity County line. The main watercourses within the Cottonwood Creek Watershed are Beegum Creek and the North Fork, Middle Fork and South Fork of Cottonwood Creek, which flow in an easterly direction to the Sacramento River.

Population is concentrated in the eastern portion of the watershed in the town of Cottonwood, with approximately 3,293 residents. Smaller communities include Igo, Ono, Platina, Beegum, and Dibble Creek.

Generally, the climate of the Cottonwood Creek Watershed is characterized by warm, dry summers and cool, wet winters. The average temperature and precipitation vary greatly within the watershed due to elevation ranges from 350-7,000 feet. The average temperature range in July is from a low of 65°F to 99°F. The average temperature in December ranges from 35°F to 55°F. Snowfall is not common in the lower elevations; however, moderate to heavy amounts of snowfall is common above 3,000 feet. Relative humidity during the summer months is usually less than 30% during the day and rises to about 50% at night. Winter humidity usually exceeds 50%.

B. PROPOSED PROJECTS

COTTONWOOD NORTH PLANNING AREA FUEL REDUCTION PROJECTS				
PROPOSED PROJECT	**MAP NUMBER[1]**	**TYPE**	**AREA (acres)**	**ESTIMATED COST[2]**
Platina Road	1	Roadside	565	$2,948,509
Stewart Ranch / Bland Road	2	Roadside	211	$1,100,945
State HWY 36	3	Roadside	926	$4,834,036
Rainbow Lake Road	4	Roadside	121	$632,727
Lower Gas Point Rd South	5	Roadside	36	$189,818
Clear Creek Rd West	6	Roadside	51	$265,745
Monastery / Hughes	7	Roadside	29	$151,855
Harrison Gulch Rd	8	Roadside	73	$379,636
Bully Choop	9	Off-road	625	$3,264,873
North Platina / Deaton	10	Roadside	58	$303,709
Deaton / Mills	11	Roadside	19	$101,236

The identified fuel reduction projects fall into two categories:

1. defensible space for homes and structures, and
2. roadside and ridgeline shaded fuelbreaks intended to create safe ingress and egress for fire personnel and escape routes for residents.

Projects were prioritized based on need and factors such as the following:

- Protection of private residences and properties;
- Access or escape route for the public and fire suppression forces;
- Identification of staging areas in conjunction with the fuelbreak development to provide fire suppression forces strategic locations for planning fire management and suppression actions.
- Connections to other fuelbreaks or areas of lower risk.

[1] Proposed projects are numbered on the map according to priority.
[2] Estimated costs of the projects are for planning purposes only. More accurate costs will be determined for the preparation of project proposals.

Landowners and residents are strongly encouraged to develop defensible space or maintain the fuels reduction projects on their properties to keep the integrity of the work done and to show project sustainability which could lead to additional future projects.

COTTONWOOD CREEK PLANNING AREA BASIC ASSUMPTIONS[3]	
Estimated cost of fuelbreak (roadside)	$5,220 per acre
Estimated cost of fuelbreak (ridgetop or off-road)	$7,310 per acre
Estimated cost of defensible space (hand labor)	$600 per dwelling (<1 acre)
Standard fuelbreak width	200 feet
Population	2.6 per dwelling
Property Value (~ $201,250 - $475,000 per dwelling)	$260,000 per dwelling
Schools	$145,000,000
Commercial Structures Value[4]	$415,500 – $23,900,000

[3] Estimated costs of the projects are for planning purposes only. More accurate costs will be determined for the preparation of project proposals.
[4] County assessed values, 2010

#1 – Platina Road

- Vulnerable to northerly wind-driven wildfires, dense fuels, and steep terrain;
- Protects residential and rural properties; and
- Provides emergency ingress/egress.

Proposed Solution:
Construct shaded fuelbreak and brush clearance as needed near Platina Road from Watson Gulch west to Platina.
23.3 miles x 200 feet across = 565 acres

Platina Road – note the large amount of brush and trees to edge of road

#2 – Stewart Ranch / Bland Road (see picture for Ball Road)

- Vulnerable to northerly wind-driven wildfires, dense fuels, and steep terrain;
- Protects residential and rural properties; and
- Provides emergency ingress/egress.

Proposed Solution:
Construct shaded fuelbreak and brush clearance as needed near Bland Road from Middle Fork Cottonwood Creek to Platina Road.
8.7 miles x 200 feet across = 211 acres

#3 – State Route 36

- Road is maintained by Caltrans. This is a major transportation route.
- Vulnerable to northerly wind-driven wildfires, dense fuels, and steep terrain;
- Protects residential and rural properties; and
- Provides emergency ingress/egress.

State Hwy 36 @ Cannon Rd

Proposed Solution:
Construct shaded fuelbreak and brush clearance as needed along Route 36.
38.2 miles x 200 feet across or the right-of-way = 926 acres

#4 – Rainbow Lake Road

- Vulnerable to northerly wind-driven wildfires, dense fuels, and steep terrain;
- Protects residential and rural properties; and
- Provides emergency ingress/egress.

Proposed Solution:
Construct shaded fuelbreak and brush clearance as needed near Rainbow Lake Road, avoiding riparian areas.
5.0 miles x 200 feet across = 121 acres

Rainbow Lake Road – note heavy tree and brush growth to edge of road.

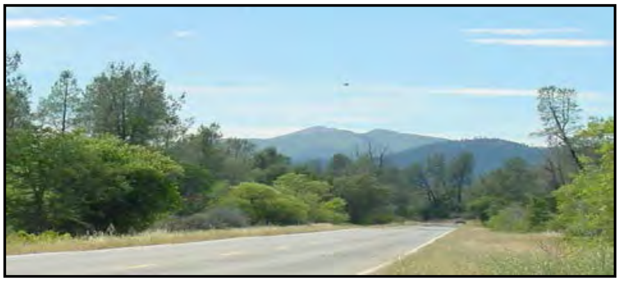
#5 – Lower Gas Point Road South

- Vulnerable to northerly wind-driven wildfires, dense fuels, and steep terrain;
- Protects residential and rural properties;
- Provides emergency ingress/egress; and
- Connects to area affected by the Clover Fire (2013) for a continuous fuelbreak.

Proposed Solution:
Construct shaded fuelbreak and brush clearance as needed near Lower Gas Point Road.
1.5 miles x 200 feet across = 36 acres

#6 – Clear Creek Road West

- Vulnerable to northerly wind-driven wildfires, dense fuels, and steep terrain;
- Protects residential and rural properties; and
- Provides emergency ingress/egress.



Clear Creek Road

Proposed Solution:
Construct shaded fuelbreak and brush clearance as needed near Clear Creek Road from Cloverdale Road to Gas Point Road.
2.1 miles x 200 feet across = 51 acres

#7 – Monastery / Hughes

- Vulnerable to northerly wind-driven wildfires, dense fuels, and steep terrain;
- Protects residential and rural properties, including a monastery; and
- Provides emergency ingress/egress.

Proposed Solution:
Construct shaded fuelbreak and brush clearance as needed near Beegum Gorge Road.
1.2 miles x 200 feet across = 29 acres

#8 – Harrison Gulch Road

- Vulnerable to northerly wind-driven wildfires, dense fuels, and steep terrain;
- Protects rural properties; and
- Provides emergency ingress/egress.

Proposed Solution:
Construct shaded fuelbreak and brush clearance as needed near Harrison Gulch Road.
3.0 miles x 200 feet across = 73 acres

Harrison Gulch Road

#9 – Bully Choop Road

- Vulnerable to northerly wind-driven wildfires, dense fuels, and steep terrain;
- Protects rural properties; and
- Provides emergency ingress/egress.

Proposed Solution:
Construct shaded fuelbreak and brush clearance as needed near Bully Choop Road.
25.8 miles x 200 feet across = 625 acres

Bully Choop Road.
Note thick vegetation to sides of road

#10 – North Platina / Deaton

- Vulnerable to northerly wind-driven wildfires, dense fuels, and steep terrain;
- Protects rural properties; and
- Provides emergency ingress/egress.

Proposed Solution:
Maintain shaded fuelbreak and brush clearance as needed near the northern part of Platina Road.
2.4 miles x 200 feet across = 58 acres

#11 – Deaton / Mills

- Vulnerable to northerly wind-driven wildfires, dense fuels, and steep terrain;
- Protects residential and agricultural properties; and
- Provides emergency ingress/egress.

Proposed Solution:
Maintain fuelbreak as needed north of the intersection of Platina Road and SR-36W.
0.8 miles x 200 feet across = 19 acres

C. ADDITIONAL FUELS REDUCTION PROJECTS

Efforts to Extend Fuel Treatments Developed by the Resource Conservation of Tehama County North from Patina to the Whiskeytown National Recreation Area

Since 2008, the RCD of Tehama County has developed almost 50 miles of fuelbreaks and other fuel treatments within the chaparral and low elevation confer forests of Western Tehama County. At the present time this network of mechanically and hand developed fuel treatment projects extends from just north of Thomes Creek in southwestern Tehama County north to the community of Platina and State Route 36E. In order to continue the development of landscape scale fire control infrastructure, the RCD of Tehama County is working with a coalition of watershed stakeholders including landowners, resource agencies and fire management entities in developing future routes for fuel breaks and other vegetation treatments that will connect those completed by the RCDTC with the large network of fuel treatments that are being developed or are already in place within Whiskeytown National Recreation area. In addition to developing routes for fuel treatments, multiple potential funding sources are being developed in order to finance this initiative.

II. COMMUNITY PRIORITIES

A. OVERALL COMMUNITY WILDFIRE RISK ASSESSMENT

COTTONWOOD CREEK PLANNING AREA
OVERALL COMMUNITY WILDFIRE RISK ASSESSMENT

Community, structure or area at risk	Map Number	Fuel Hazard	Wildfire Occurrence Risk	Structural Ignitability	Preparedness Capability	Overall Risk	Fire Hazard Severity Zone Rating	WUI
Platina Road	1	High	High	High	Low	High	Very High	Yes
Stewart Ranch / Bland Road	2	High	High	High	Low	High	Very High	Yes
HWY-36	3	High	High	High	Low	High	Very High	Yes
Rainbow Lake Road	4	High	High	High	Low	High	Very High	Yes
Lower Gas Point Rd South	5	High	High	High	Low	High	Very High	Yes
Clear Creek Rd West	6	High	High	High	Low	High	Very High	Yes
Monastery / Hughes	7	High	High	High	Low	High	Very High	Yes
Harrison Gulch Road	8	High	High	High	Low	High	Very High	Yes
Bully Choop	9	High	High	High	Low	High	Very High	Yes
North Platina / Deaton	10	High	High	High	Low	High	Very High	Yes
Deaton / Mills	11	High	High	High	Low	High	Very High	Yes

B. OVERALL COMMUNITY HAZARD REDUCTION ASSESSMENT

COTTONWOOD CREEK PLANNING AREA OVERALL COMMUNITY HAZARD REDUCTION ASSESSMENT					
Community, structure or area at risk	**Map Number**	**Overall Risk**	**Cultural Value**	**Treatment Type**	**Treatment Method**
Platina Road	1	High	Low	Fuelbreak	Brush and tree removal, pruning
Stewart Ranch / Bland Road	2	High	Low	Fuelbreak	Brush and tree removal, pruning
HWY-36	3	High	Low	Fuelbreak	Brush and tree removal, pruning
Rainbow Lake Road	4	High	Low	Fuelbreak	Brush and tree removal, pruning
Lower Gas Point Rd South	5	High	Low	Fuelbreak	Brush and tree removal, pruning
Clear Creek Rd West	6	High	Low	Fuelbreak	Brush and tree removal, pruning
Monastery / Hughes	7	High	Low	Fuelbreak	Brush and tree removal, pruning
Harrison Gulch Road	8	High	Low	Fuelbreak	Brush and tree removal, pruning
Bully Choop	9	High	Low	Fuelbreak	Brush and tree removal, pruning
North Platina / Deaton	10	High	Low	Fuelbreak	Brush and tree removal, pruning
Deaton / Mills	11	High	Low	Fuelbreak	Brush and tree removal, pruning

COMMUNITY

On the western side of the planning area, the community of Platina is most at risk because it is surrounded by dense chaparral and woodland, which poses a serious fire danger. On the eastern side of the planning area, the communities of Igo and Ono are also located in close proximity to chaparral. The assets or values at risk from fire are the many homes located throughout this area. Anderson-Cottonwood Irrigation District (ACID) canals supply irrigation water to numerous ranches in this eastern portion of the watershed and are accordingly emergency water sources for these residential areas.

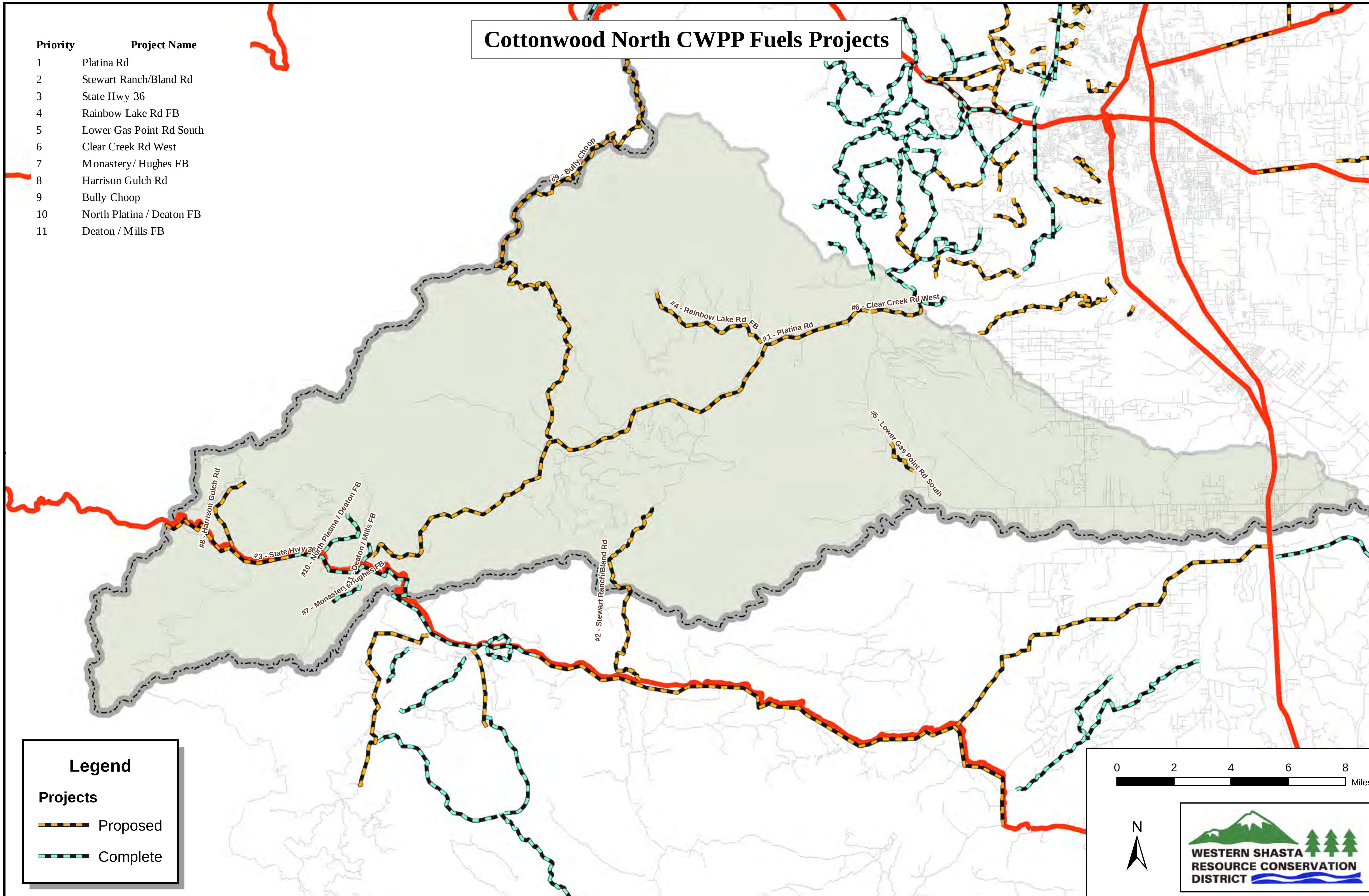
Two major fires have occurred in the planning area recently. The Bully Fire in 2014 consumed over 12,000 acres near Platina Road and Bully Choop Road. The 2013 Clover Fire consumed over 8,000 acres in southern Igo. It caused one death and six injuries and destroyed 68 residences and 128 other structures. Damages are estimated at $65 million. The fire was stopped just short of the Northern California Veterans Cemetery.

Northern California Veterans Cemetery in Igo

Anderson-Cottonwood Irrigation District (ACID) aqueduct is a Historical Place of Interest

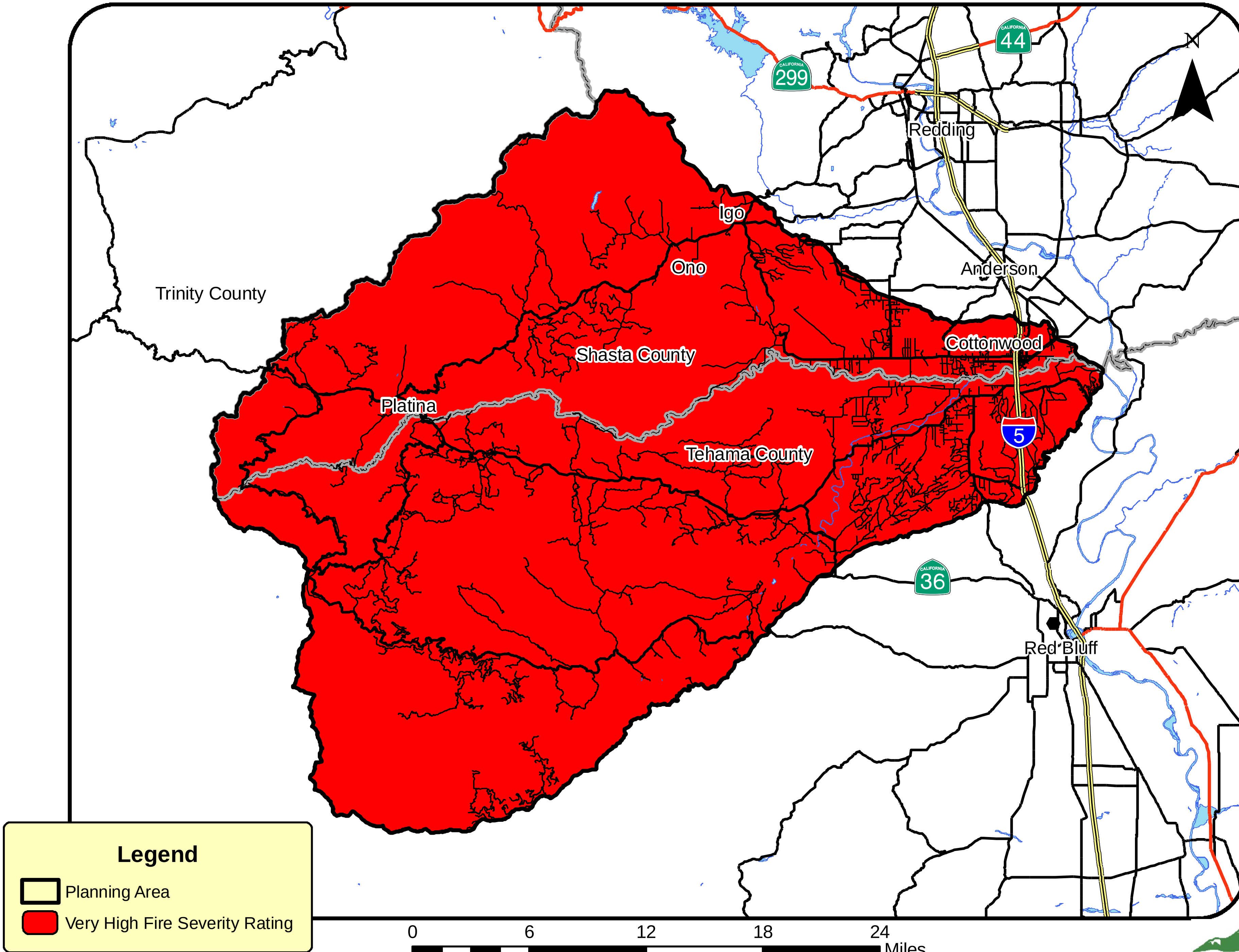
MAPS OF COTTONWOOD NORTH PLANNING AREA

1. **COTTONWOOD NORTH PROPOSED PROJECTS AND PLANNING AREA**
2. **COTTONWOOD CREEK WATERSHED FIRE SEVERITY RATING**
3. **COTTONWOOD CREEK WATERSHED GENERALIZED VEGETATION**
4. **COTTONWOOD CREEK WATERSHED SPECIAL STATUS SPECIES AND HABITAT**



Cottonwood North CWPP Fuels Projects
Priority
Project Name
1 Platina Rd
2 Stewart Ranch/Bland Rd
3 State Hwy 36
4 Rainbow Lake Rd FB
5 Lower Gas Point Rd South
6 Clear Creek Rd West
7 Monastery/ Hughes FB
8 Harrison Gulch Rd
9 Bully Choop
10 North Platina / Deaton FB
11 Deaton / Mills FB
#9 - Bully Choop
#4 - Rainbow Lake Rd FB
#1 - Platina Rd
#6 - Clear Creek Rd West
#5 - Lower Gas Point Rd South
#8 - Harrison Gulch Rd
#3 - State Hwy 36
#10 - North Platina / Deaton FB
#11 - Deaton / Mills FB
#7 - Monastery / Hughes FB
#2 - Stewart Ranch/Bland Rd
Legend
Projects
Proposed
Complete
0 2 4 6 8
Miles
N
WESTERN SHASTA RESOURCE CONSERVATION DISTRICT

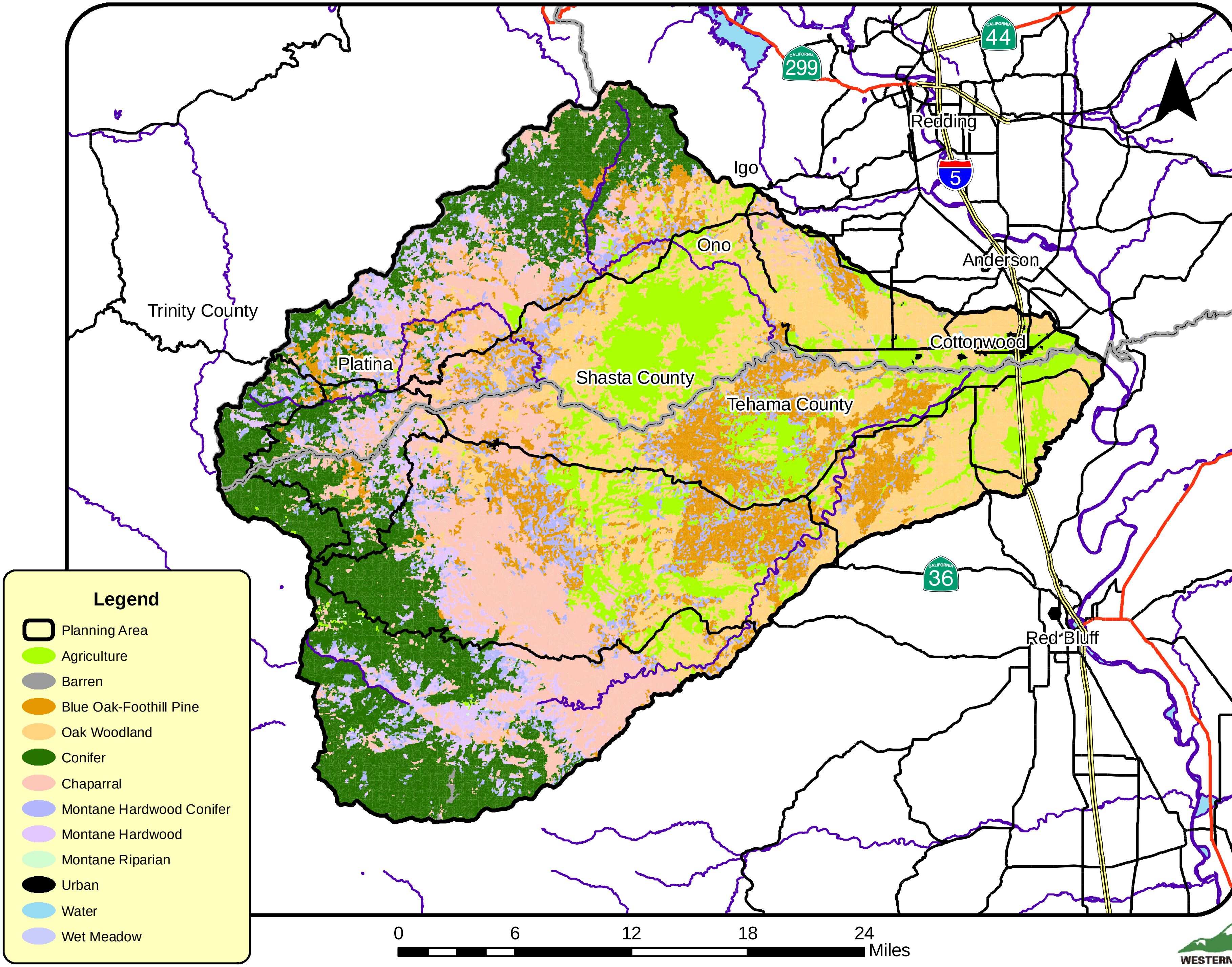
FIRE SEVERITY RATING



VERY HIGH FIRE HAZARD SEVERITY ZONE as Recommended by CAL FIRE

WESTERN SHASTA RESOURCE CONSERVATION DISTRICT

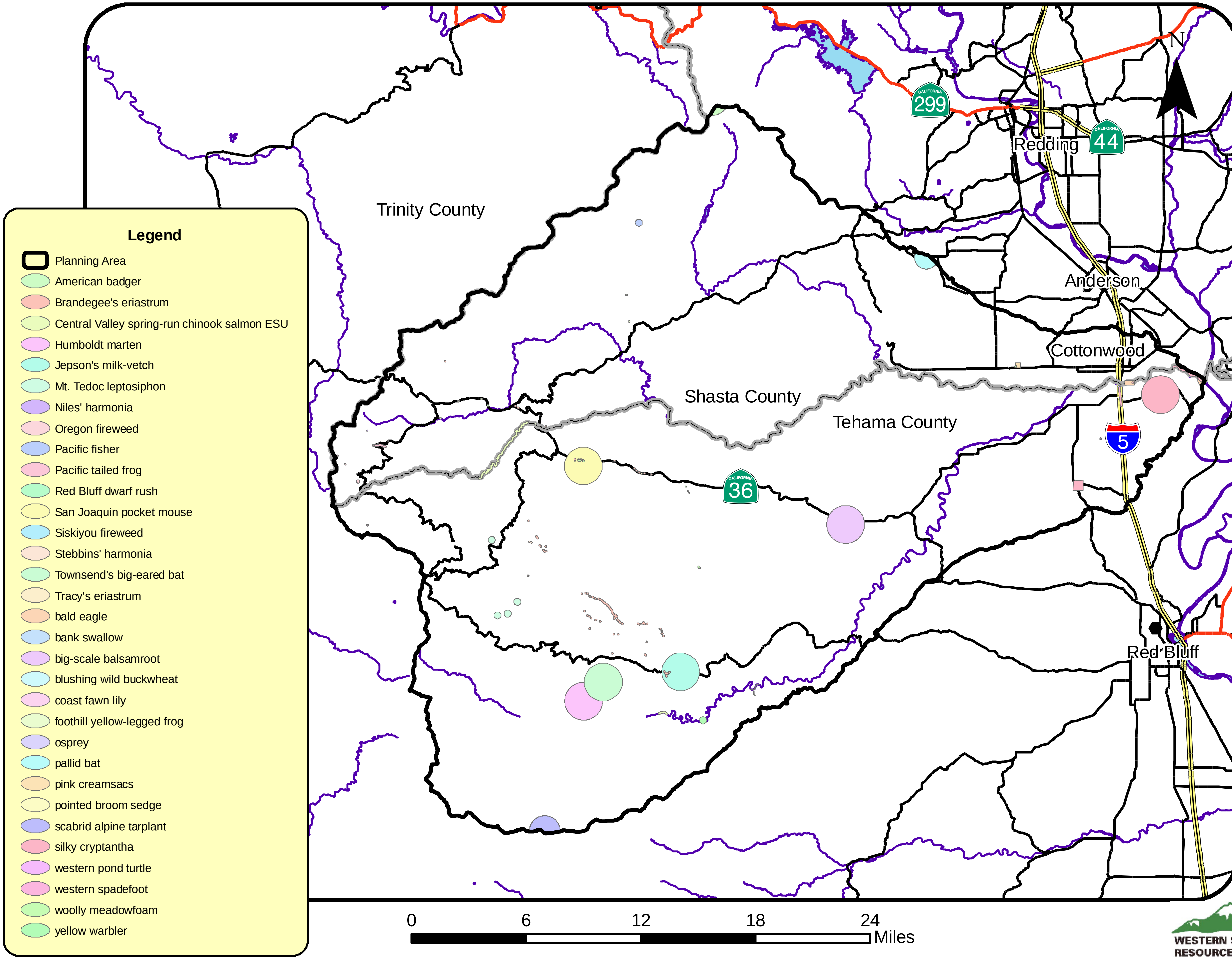
VEGETATION MAP



WESTERN SHASTA RESOURCE CONSERVATION DISTRICT

MAP 4

SPECIAL STATUS WILDLIFE AND PLANT SPECIES



WESTERN SHASTA RESOURCE CONSERVATION DISTRICT

2016
SHASTA COUNTY
COMMUNITY WILDFIRE PROTECTION PLAN

COW CREEK
PLANNING AREA

Covering the communities of:

- Backbone Ridge
- Bella Vista (east)
- Millville
- Montgomery Creek
- Oak Run
- Palo Cedro
- Round Mountain
- Whitmore

COW CREEK PLANNING AREA
(2016)

I. PROPOSED PROJECTS

A. THE PLANNING AREA

The Cow Creek planning area includes the communities of Palo Cedro, Bella Vista, Whitmore, Oak Run, Round Mountain, Montgomery Creek, and Backbone Ridge. Land ownership is predominately private lands with approximately 98% in private ownership and 2% managed by public agencies. The Latour State Forest is the largest block of public lands in the watershed and is managed by CAL FIRE for multiple uses including sustained yields of timber harvest, recreation, and wildlife management. Population is concentrated in the five major tributaries; North (Little) Cow, Oak Run, Clover, Old Cow and South Cow Creeks. Palo Cedro is the largest community.

The Cow Creek Watershed encompasses approximately 275,000 acres and is located in Shasta County on the eastern side of the Sacramento River**.** The topography of the Cow Creek Watershed varies significantly from the flat valley areas around the main stem to mountainous upper reaches. Elevation of the watershed varies from 340 feet above sea level at the valley floor to over 7300 feet at the upper reaches of the watershed. This steep elevational gradient results in a diverse mix of ecotypes throughout the watershed. The summers are hot and dry and winters are cool with moderate rainfall and snow above the 4,000 feet. Annual precipitation ranges from about 25 inches in the valley to about 65 inches in the northeastern portion of the watershed. Most of the precipitation falls in the winter between November 1 and April 30.

B. PROJECT PRIORITIES

COW CREEK PLANNING AREA FUEL REDUCTION PROJECTS				
PROPOSED PROJECT	**MAP NUMBER[1]**	**TYPE**	**AREA (acres)**	**ESTIMATED COST[2]**
Phillips Road	1	Fuelbreak	84	$436,582
Bullskin Ridge	2	Fuelbreak	56	$291,055
Buzzards Roost Road	3	Fuelbreak	42	$221,455
Mill Creek Subdivision	4	Fuelbreak	80	$584,800
Oak Run to Fern Road	5	Fuelbreak	101	$525,164
Fern Road East	6	Fuelbreak	131	$956,945
Oak Run Road	7	Fuelbreak	245	$1,278,109
Whitmore Road	8	Fuelbreak	221	$1,151,564
McCandless Gulch Road	9	Fuelbreak	32	$164,509
Fern Road	10	Fuelbreak	92	$480,873
Tamarack Road	11	Fuelbreak	131	$683,345
Bateman Road	12	Fuelbreak	168	$879,491
Ponderosa Way	13	Fuelbreak	61	$316,364

The identified fuel reduction projects fall into two categories:

1. defensible space for homes and structures, and
2. roadside and ridgeline shaded fuelbreaks intended to create safe ingress and egress for fire personnel and escape routes for residents.

Projects were prioritized based on need and factors such as the following:

- Protection of private residences and properties;
- Access or escape route for the public and fire suppression forces;
- Identification of staging areas in conjunction with the fuelbreak development to provide fire suppression forces strategic locations for planning fire management and suppression actions.
- Connections to other fuelbreaks or areas of lower risk.

Landowners and residents are strongly encouraged to develop defensible space or maintain the fuels reduction projects on their properties to keep the integrity of the work done and to show project sustainability which could lead to additional future projects.

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[1] Proposed projects are numbered on the map according to priority.
[2] Estimated costs of the projects are for planning purposes only. More accurate costs will be determined for the preparation of project proposals.

COW CREEK PLANNING AREA BASIC ASSUMPTIONS[3]	
Estimated cost of fuelbreak (roadside)	$5,220 per acre
Estimated cost of fuelbreak (ridgetop or off-road)	$7,310 per acre
Estimated cost of defensible space (hand labor)	$600 per dwelling (<1 acre)
Standard fuelbreak width	200 feet
Population	2.6 per dwelling
Property Value (~ $201,250 - $475,000 per dwelling)	$260,000
Schools	$145,000,000
Commercial Structures Value[4]	$415,500 – $23,900,000
Power line	$250,000/mile

[3] Estimated costs of the projects are for planning purposes only. More accurate costs will be determined for the preparation of project proposals.
[4] County assessed values, 2010

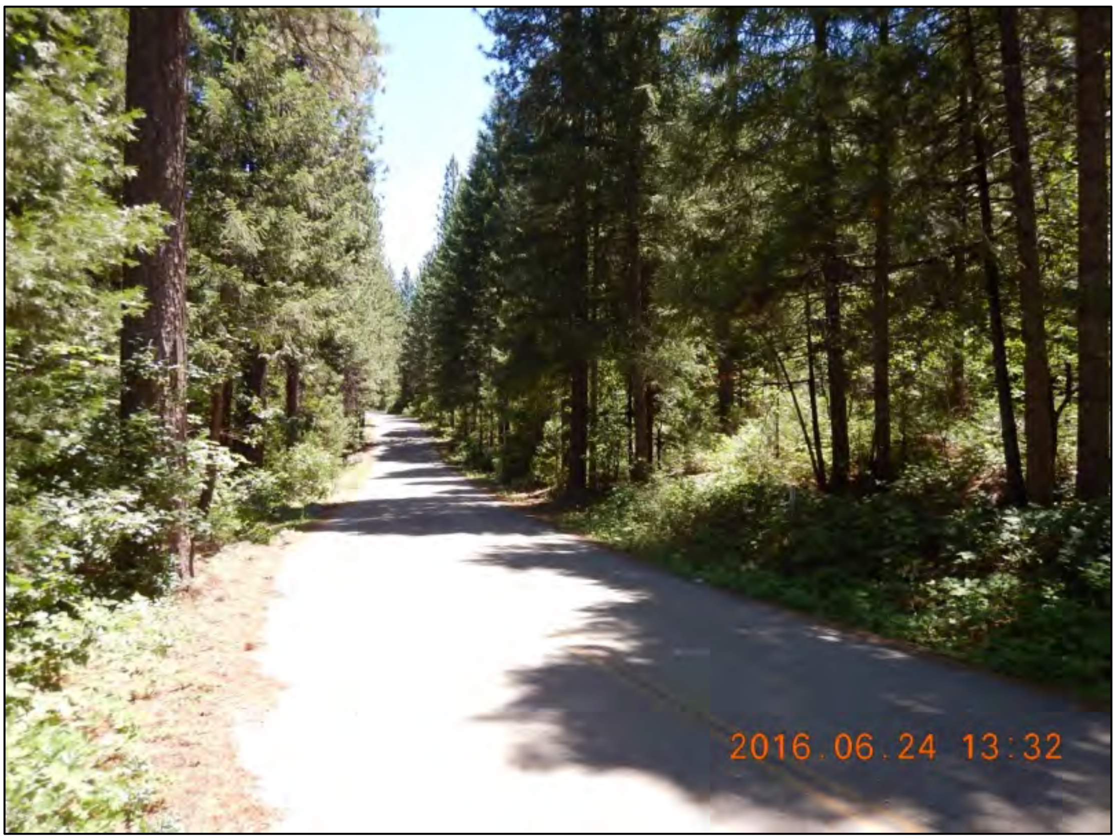
#1 – Phillips Road

- Poor fire access and escape along Phillips Road.
- Provides a north-south fuelbreak in the watershed, predominantly within mixed conifer forests and perpendicular to prevailing winds;
- Provides important access for fire suppression forces in this portion of the watershed; and
- Connects to the proposed fuelbreak on Oak Run to Fern Road, which provides another level of protection to residents and property in this area.

Proposed Solution:

Construct shaded fuelbreaks near Phillips Road.

6.9 miles long x 100 feet across to the right-of-way = 84 acres.



Phillips Road: Note the dense brush and trees up to edge of the road.

#2 – Bullskin Ridge Road

- Provides another link in the fuelbreak system to the Oak Run Road Fuelbreak; and
- Provides protection to numerous private residences that are vulnerable to being destroyed by wildfire.

Proposed Solution:
Construct shaded fuelbreaks near Bullskin Ridge Road:
4.5 miles long x 100 feet across to the right-of-way = 56 acres.

Bullskin Ridge Road: Note the dense vegetation up to the edge of the road.

#3 – Buzzards Roost Road

- Provides another link in the fuelbreak system to the Oak Run Road Fuelbreak;
- Provides protection to the areas of numerous private residences that are vulnerable of being destroyed by wildfire; and
- Ties the eastern end of the project into areas burned under the Fountain Fire;

Proposed Solution:

Construct shaded fuelbreaks near Buzzards Roost Road:

3.5 miles long x 100 feet across to the right-of-way = 42 acres.

Buzzards Roost Road: Note the dense vegetation up to the edge of the road.

#4 – Mill Creek Subdivision

- Provides a fuelbreak around the Mill Creek subdivision;
- Provides protection to numerous private residences that are vulnerable to being destroyed by wildfire; and
- Identifies staging areas in conjunction with the fuelbreak development to provide fire suppression forces strategic locations for planning fire management and suppression actions.

Proposed Solution:

- Construct shaded fuelbreaks around the subdivision connecting Phillips Road on the north and south of the subdivision:
  3.3 miles long x 200 feet across = 80 acres.

Mill Creek Subdivision: Note the dense vegetation up to the edge of the narrow, winding road.

#5 – Oak Run to Fern Road

- Is located in an area that has had little fuel reduction activities implemented in the past;
- Provides a critical first step in providing a strategic fuel reduction project in the area;
- Provides a fuelbreak perpendicular to prevailing winds;
- Helps protect life and property of numerous private residences that are vulnerable to being destroyed by wildfire;
- Identifies staging areas in conjunction with the fuelbreak development will provide fire suppression forces strategic locations for planning fire management and suppression actions;
- Provides relatively low cost for implementation for about one-half of the project;
- Enables other areas of dense conifer vegetation to be treated with mechanical methods and commercial harvests (both biomass and timber), which will speed implementation and reduce overall project costs; and
- Provides a critical access route for public escape and fire suppression forces from Oak Run to Whitmore.

Proposed Solution:

Construct shaded fuelbreaks along Oak Run to Fern Road:
8.3 miles long x 100 feet across to the right-of-way = 101 acres.

Oak Run to Fern Road Fuelbreak: Note dense brush and trees up to the edge of the road

#6 – Fern Road East

- Links to the Oak Run to Fern Road Fuelbreak, providing a continuous fuelbreak from Highway 299 to Whitmore Road;
- Is perpendicular to prevailing winds;
- Provides a critical access route for fire suppression forces accessing both sides of the Cow Creek Watershed; and
- Protects a telecommunications tower.

Proposed Solution:

Construct shaded fuelbreaks near Fern Road East:
5.4 miles long x 200 feet across = 131 acres.

Fern Road East Fuelbreak: Note dense brush and trees up to the edge of the road.

#7 – Oak Run Road

- Provides the start of a north-south fuelbreak that will begin to divide the Cow Creek Watershed, helping to keep fire from spreading up the watershed into heavier fuels and will be perpendicular to prevailing winds in most locations;
- Helps protect numerous private residences that are vulnerable to being destroyed by wildfire, and fuel reduction will help protect life and property;
- Identifies staging areas in irrigated pastures and other clearings in conjunction with the development of the fuelbreak that will provide fire suppression forces strategic locations for planning fire management and suppression actions; and
- Enables vegetation to be treated with mechanical methods and commercial harvests (both biomass and timber), which will speed implementation and reduce overall project costs.

Proposed Solution:

Construct shaded fuelbreaks along Oak Run Road:
20 miles long x 100 feet wide or right-of-way = 245 acres.

Oak Run Road between Highway 299 and Buzzards Roost Road. Lower elevations along Oak Run Road are dominated by oak woodlands which do not require construction of a shaded fuelbreak.

#8 – Whitmore Road

- Provides a significant east-west fuelbreak from Millville to Whitmore, effectively bisecting the southern 1/3 of the watershed;
- Reduces fuels around residences, helping to protect them from being destroyed by wildfire;
- Develops large block burning activities through the CVMP on lands adjacent to the fuelbreak, effectively protecting much larger areas of the watershed; and
- Enables vegetation to be treated with mechanical methods and commercial harvests (both biomass and timber), which will speed implementation and reduce overall project costs.

Proposed Solution:
Construct shaded fuelbreaks near Whitman Road:
18.2 miles long x 100 feet across to the right-of-way = 221 acres.

Whitmore Road east of Whitmore. Lower elevations along Whitmore Road are dominated by oak woodlands which do not require construction of a shaded fuelbreak.

#9 – McCandless Gulch Road

- Provides an north-south fuelbreak through commercial timberlands that can have extremely active fire behavior and very high fire severity;
- Utilizes existing and planned fuelbreaks and forest management activities;
- Provides protection to the upper watershed, as part of a series of three interconnected fuelbreaks (Tamarack, Ponderosa, and Bateman); and

Proposed Solution:
Construct shaded fuelbreaks along McCandless Gulch Road:
2.6 miles long x 100 feet across to the right-of-way = 32 acres.


McCandless Gulch Road Fuelbreak: Note dense brush and trees up to the edge of the road.

#10 – Fern Road

- Provides a significant east-west fuelbreak from Whitmore to Oak Run, effectively bisecting the eastern 1/3 of the watershed; and
- Provides ingress and egress for emergency crews and residents.

Proposed Solution:
Construct shaded fuelbreaks along Fern Road:
7.6 miles long x 100 feet across to the right-of-way = 92 acres.

#11 –Tamarack Road

- Concern over the regrowth of flammable fuels.
- Protects the community of Whitmore, which includes a fire station, school, store, community center, post office, churches, timberland, and some businesses.

Proposed Solution:
Conduct maintenance along Tamarack Road:
10.8 miles long x 100 feet across to the right-of-way = 131 acres.

#12 – Bateman Road

- Provides a significant east-west fuelbreak from Latour State Forest to Whitmore, effectively bisecting the southern 1/3 of the watershed;
- Provides ingress and egress for emergency crews and residents.

Proposed Solution:
Maintain fuelbreak along Bateman Road:
13.9 miles long x 100 feet across to the right-of-way = 168 acres.

#13 – Ponderosa Way

- Provides a significant east-west fuelbreak from Millville to Whitmore, effectively bisecting the southern 1/3 of the watershed; and
- Provides ingress and egress for emergency crews and residents.

Proposed Solution:
Maintain shaded fuelbreak along Ponderosa Way:
5 miles long x 100 feet across to the right-of-way = 61 acres.

II. COMMUNITY PRIORITIES

A. OVERALL COMMUNITY WILDFIRE RISK ASSESSMENT

COW CREEK PLANNING AREA
OVERALL COMMUNITY WILDFIRE RISK ASSESSMENT

Community, structure or area at risk	Map Number	Fuel Hazard	Wildfire Occurrence Risk	Structural Ignitability	Preparedness Capability	Overall Risk	Fire Hazard Severity Zone Rating	WUI
Phillips Road	1	High	High	High	Low	High	Very High	Yes
Bullskin Ridge	2	High	High	High	Low	High	Very High	Yes
Buzzards Roost Road	3	High	High	High	Low	High	Very High	Yes
Mill Creek Subdivision	4	High	High	High	Low	High	Very High	Yes
Oak Run to Fern Road	5	High	High	High	Low	High	Very High	Yes
Fern Road East	6	High	High	High	Low	High	Very High	Yes
Oak Run Road	7	High	High	High	Low	High	Very High	Yes
Whitmore Road	8	High	High	High	Low	High	Very High	Yes
McCandless Road Gulch	9	High	High	High	Low	High	Very High	Yes
Fern Road	10	High	High	High	Low	High	Very High	Yes
Tamarack Road	11	High	High	High	Low	High	Very High	Yes
Bateman Road	12	High	High	High	Low	High	Very High	Yes
Ponderosa Way	13	High	High	High	Low	High	Very High	Yes

B. OVERALL COMMUNITY HAZARD REDUCTION ASSESSMENT

COW CREEK PLANNING AREA OVERALL COMMUNITY HAZARD REDUCTION ASSESSMENT					
Community, structure or area at risk	**Map Number**	**Overall Risk**	**Cultural Value**	**Treatment Type**	**Treatment Method**
Phillips Road	1	High	High	Fuelbreak	Brush and tree removal, pruning
Bullskin Ridge	2	High	High	Fuelbreak	Brush and tree removal, pruning
Buzzards Roost Road	3	High	High	Fuelbreak	Brush and tree removal, pruning
Mill Creek Subdivision	4	High	High	Fuelbreak	Brush and tree removal, pruning
Oak Run to Fern Road	5	High	High	Fuelbreak	Brush and tree removal, pruning
Fern Road East	6	High	High	Fuelbreak	Brush and tree removal, pruning
Oak Run Road	7	High	High	Fuelbreak	Brush and tree removal, pruning
Whitmore Road	8	High	High	Fuelbreak	Brush and tree removal, pruning
McCandless Road Gulch	9	High	High	Fuelbreak	Brush and tree removal, pruning
Fern Road	10	High	High	Fuelbreak	Brush and tree removal, pruning
Tamarack Road	11	High	High	Fuelbreak	Brush and tree removal, pruning
Bateman Road	12	High	High	Fuelbreak	Brush and tree removal, pruning
Ponderosa Way	13	High	High	Fuelbreak	Brush and tree removal, pruning

III. COMMUNITY VALUES

RESIDENCES AND MAJOR STRUCTURES

The landscapes of residential settlements are a particularly sensitive aesthetic resource. Research has demonstrated that as many as one in five residents in the wildland-urban intermix feel a lush landscape today is more important than saving their home from a wildfire that may or may not occur. Comments in focus groups and public meetings reinforce the notion that rich vegetation across the landscape is essential to the quality of life they experience as part of living in a forest landscape

Oak Run Country Store

Oak Run Volunteer Fire Department Station

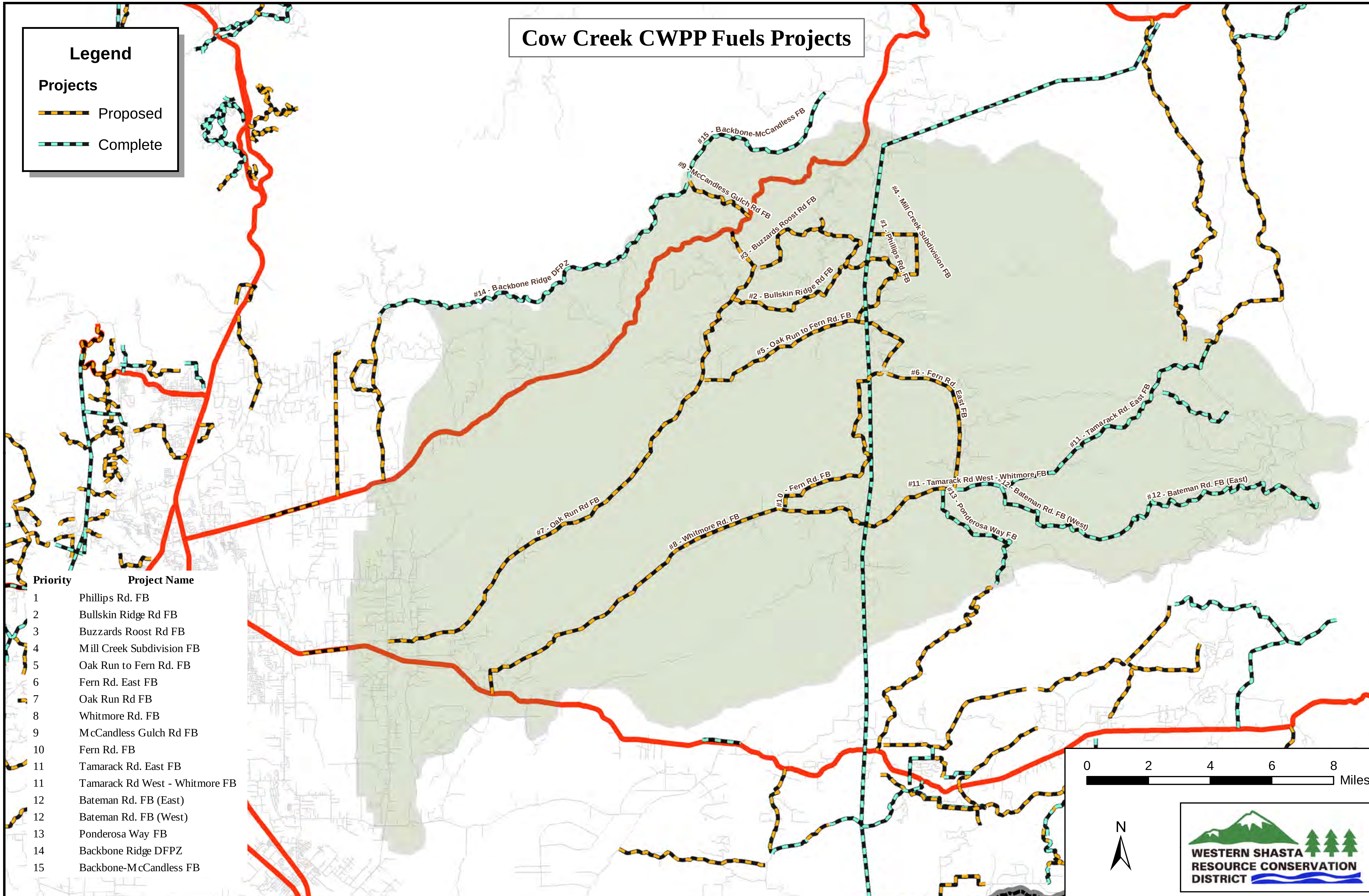
Whitmore Community Center

Whitmore School

MAPS OF COW CREEK PLANNING AREA

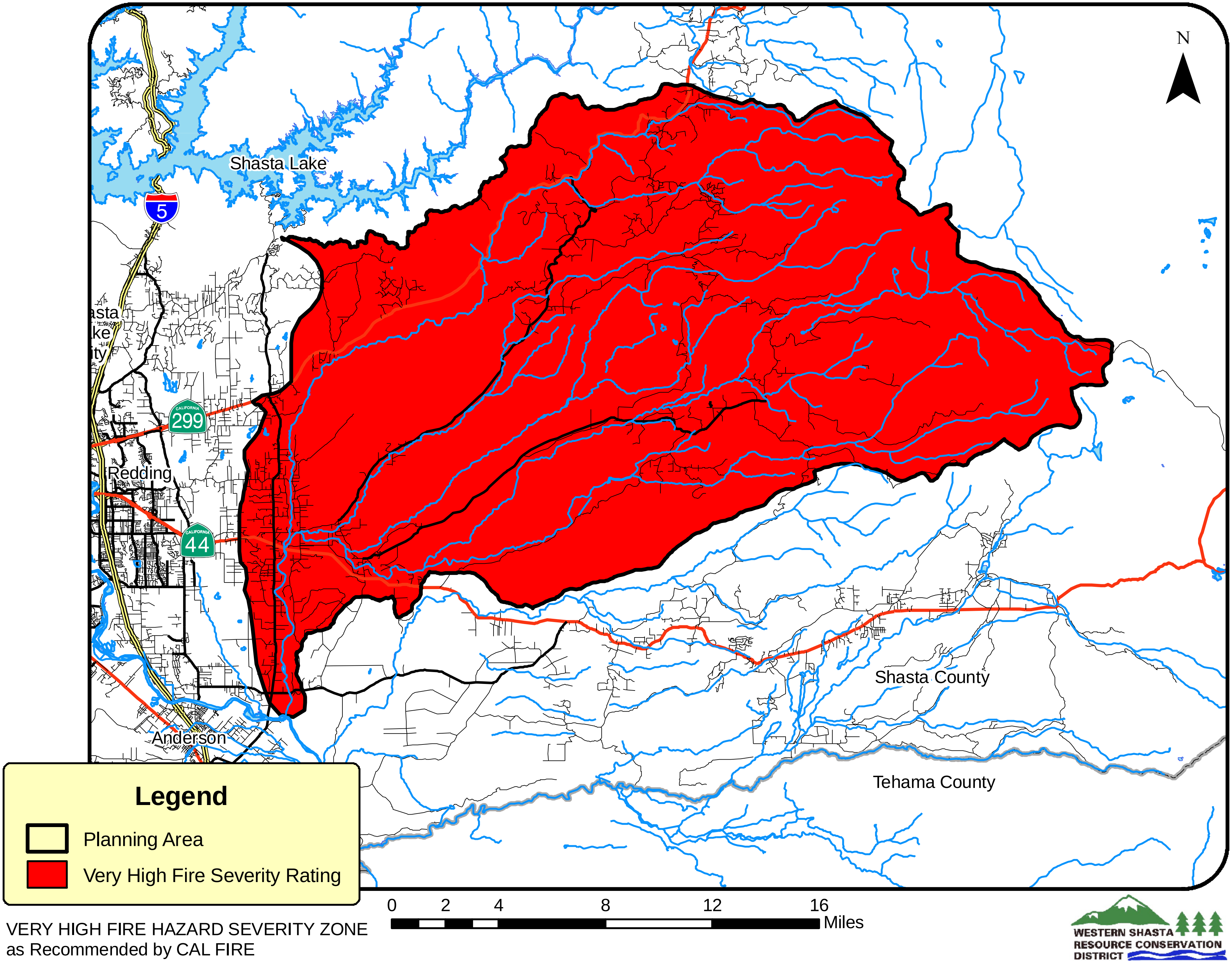
1. **COW CREEK PROPOSED PROJECTS AND PLANNING AREA**
2. **FIRE SEVERITY RATING**
3. **VEGETATION**
4. **SPECIAL STATUS SPECIES AND HABITAT**

MAP 1



Priority	Project Name
1	Phillips Rd. FB
2	Bullskin Ridge Rd FB
3	Buzzards Roost Rd FB
4	Mill Creek Subdivision FB
5	Oak Run to Fern Rd. FB
6	Fern Rd. East FB
7	Oak Run Rd FB
8	Whitmore Rd. FB
9	McCandless Gulch Rd FB
10	Fern Rd. FB
11	Tamarack Rd. East FB
11	Tamarack Rd West - Whitmore FB
12	Bateman Rd. FB (East)
12	Bateman Rd. FB (West)
13	Ponderosa Way FB
14	Backbone Ridge DFPZ
15	Backbone-McCandless FB

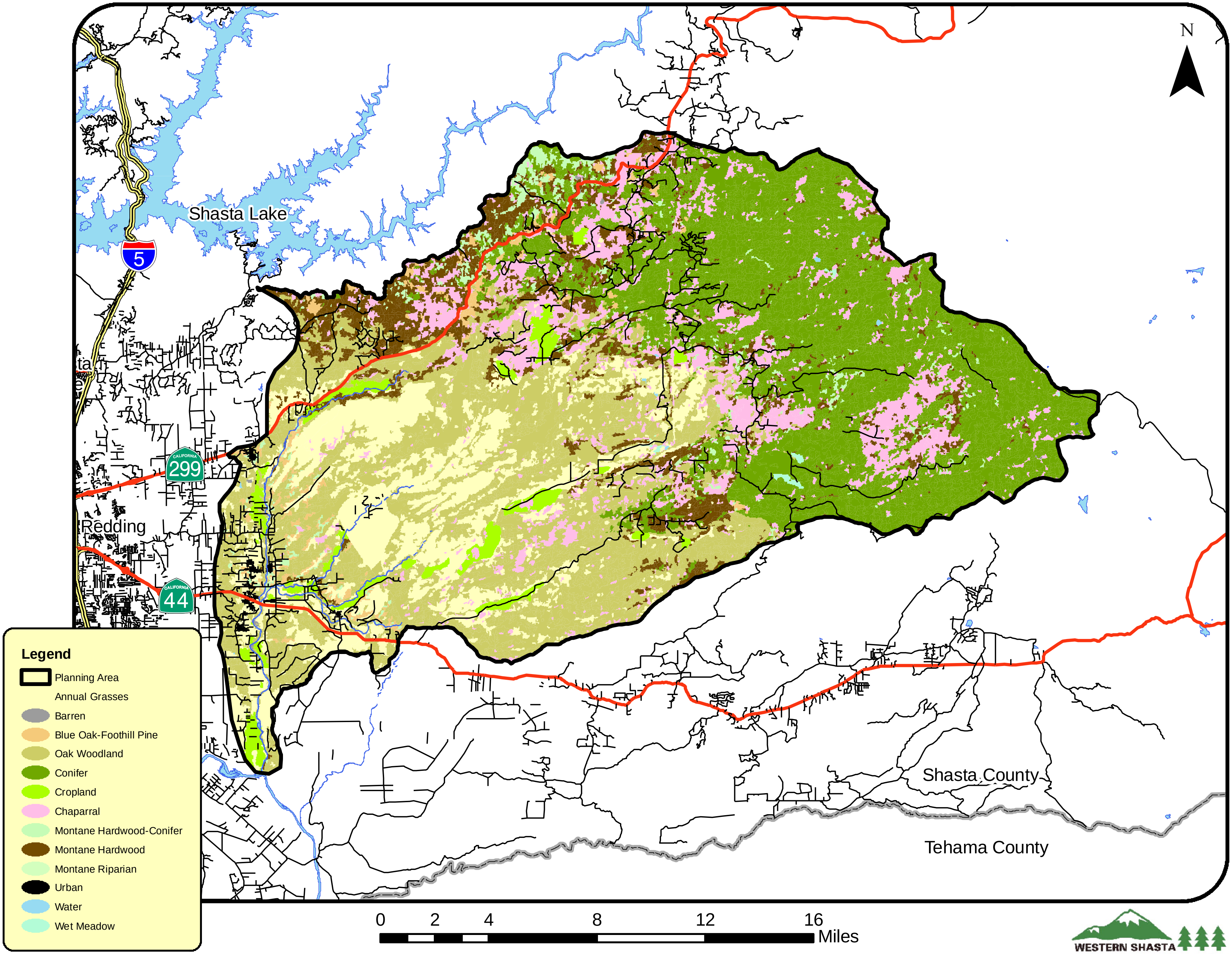
COW CREEK FIRE SEVERITY RATING



VERY HIGH FIRE HAZARD SEVERITY ZONE
as Recommended by CAL FIRE

MAP 3

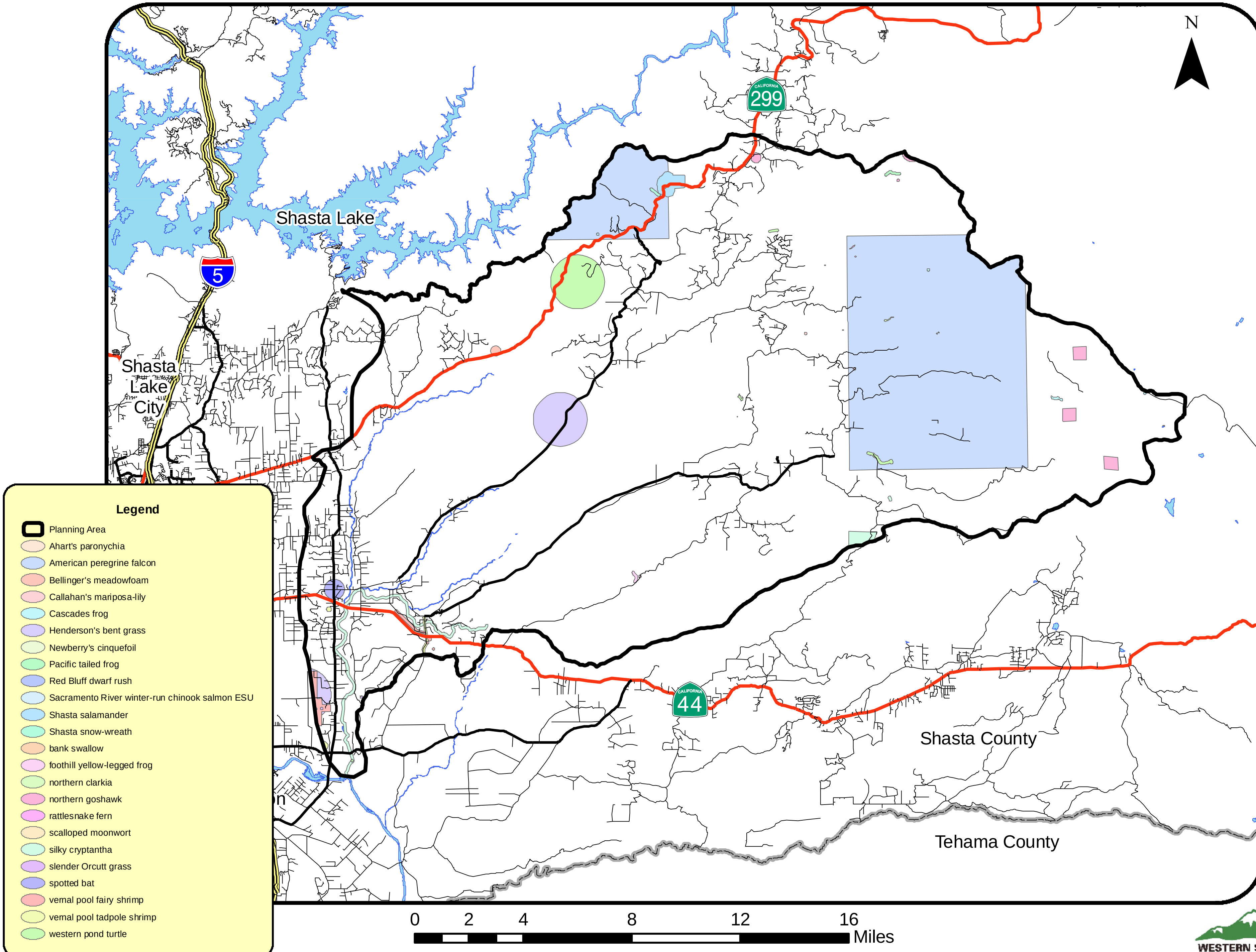
COW CREEK VEGETATION MAP



WESTERN SHASTA RESOURCE CONSERVATION DISTRICT

MAP 4

SPECIAL STATUS WILDLIFE AND PLANT SPECIES



WESTERN SHASTA RESOURCE CONSERVATION DISTRICT

2016
SHASTA COUNTY
COMMUNITY WILDFIRE PROTECTION PLAN

FRENCH GULCH
(UPPER CLEAR CREEK)
PLANNING AREA

Covering the community of:

- French Gulch

FRENCH GULCH (UPPER CLEAR CREEK)
PLANNING AREA
(2016)

I. PROPOSED PROJECTS

A. THE PLANNING AREA

The French Gulch (Upper Clear Creek) planning area includes the watershed of Upper Clear Creek, the community of French Gulch and surrounding rural residential areas occupying about 800 acres between French Gulch and Big Gulch. French Gulch is the only 'town' in the watershed and is a historic mining area with approximately 650 residents. Land ownership is approximately 67% public and 33% private, including Sierra Pacific Industries (SPI) lands and other private land ownership..

The Upper Clear Creek/French Gulch Watershed is located approximately 16 miles west of the City of Redding, California and 235 miles north of San Francisco. Upper Clear Creek is component of the Upper Sacramento River Basin (Hydrologic Unit Code 18020112) and is an important tributary of the Sacramento River. It flows into Whiskeytown Reservoir and then ultimately into the Sacramento River. The watershed is about 35 miles long, ranges from five to 12 miles wide, and covers a total area of about 249 square miles or approximately 127,916 acres. The watershed can be reached from the east and west, along State Highway 299, the major two-lane highway connecting Weaverville and Redding.

The topography of this watershed is steep, with elevations from 976 to 6,209 feet, draining into Upper Clear Creek and flowing into Whiskeytown Reservoir, from which Lower Clear Creek flows to the Sacramento River. The watershed has remained relatively undeveloped over time and is a high quality water supply for the Central Valley Project, which supplies water throughout the state. Vegetative communities include grasslands, chaparral, mixed conifer-hardwood, mixed fir, mixed oak woodland, mixed pine, and wet meadow/marsh. Two sensitive plant species have been found in the planning area: Howell's alkali grass (Puccinellia howellii) and Canyon Creek stonecrop (Sedum paradisum).

B. PROJECT PRIORITIES

FRENCH GULCH (UPPER CLEAR CREEK) PLANNING AREA FUEL REDUCTION PROJECTS				
PROPOSED PROJECT	**MAP NUMBER[1]**	**TYPE**	**AREA (acres)**	**ESTIMATED COST[2]**
Niagra Street	1	Fuelbreak	18	$132,909
Lower Trinity Mtn. Road	2	Fuelbreak	87	$637,964
Middle Trinity Mtn. Road	3	Fuelbreak	70	$513,915
East Fork Road	4	Fuelbreak	85	$620,242
French Gulch School	5	Fuelbreak	12	$88,606
Highland Ridge Road	6	Fuelbreak	15	$106,327
Upper-Middle Trinity Mountain Road	7	Fuelbreak	53	$389,867
Dutch Gulch	8	Fuelbreak	22	$159,491
Summit Gulch	9	Fuelbreak	56	$407,588
Upper Trinity Mtn. Road	10	Fuelbreak	48	$354,424
Trinity Mtn. Road (West)	11	Maintenance	124	$903,782
Meisner Ranch	12	Maintenance	15	$106,327
Drunken Gulch	13	Maintenance	17	$124,048
Cline Gulch Road	14	Maintenance	51	$372,145

The identified fuel reduction projects fall into two categories:
1. defensible space for homes and structures, and
2. roadside and ridgeline shaded fuelbreaks intended to create safe ingress and egress for fire personnel and escape routes for residents.

Projects were prioritized based on need and factors such as the following:
- Protection of private residences and properties;
- Access or escape route for the public and fire suppression forces;
- Identification of staging areas in conjunction with the fuelbreak development to provide fire suppression forces strategic locations for planning fire management and suppression actions.
- Connections to other fuelbreaks or areas of lower risk.

Landowners and residents are strongly encouraged to develop defensible space or maintain the fuels reduction projects on their properties to keep the integrity of the work done and to show project sustainability which could lead to additional future projects.

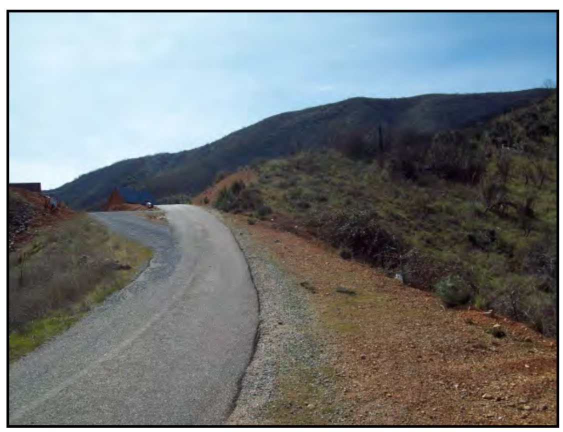
[1] Proposed projects are numbered on the map according to priority.
[2] Estimated costs of the projects are for planning purposes only. More accurate costs will be determined for the preparation of project proposals.

FRENCH GULCH PLANNING AREA BASIC ASSUMPTIONS[3]	
Estimated cost of fuelbreak (roadside)	$5,220 per acre
Estimated cost of fuelbreak (ridgetop or off-road)	$7,310 per acre
Estimated cost of defensible space (hand labor)	$600 per dwelling (<1 acre)
Standard fuelbreak width	200 feet
Population	2.6 per dwelling
Property Value (~ $201,250 - $475,000 per dwelling)	$260,000
Schools	$145,000,000
Commercial Structures Value[4]	$415,500 – $23,900,000
Power line	$250,000/mile

#1 – Niagra Street

- Threat of wildfire moving from the west into the town of French Gulch;
- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Protects residential property, Main Street, and a water tower; and
- Provides emergency ingress/egress.

Proposed Solution:
Construct shaded fuelbreaks from French Gulch Road north behind the cemetery to Niagra Street.
0.8 miles long x 200 feet across = 18 acres



Niagra Street Fuelbreak: Looking south from Niagra Street.

[3] Estimated costs of the projects are for planning purposes only. More accurate costs will be determined for the preparation of project proposals.
[4] County assessed values, 2010

#2 – Lower Trinity Mountain Road

- Vulnerable to wind-driven wildfires, fuels accumulation, and steep terrain;
- Protects rural residences; and
- Provides emergency ingress/egress.

Proposed Solution:
Construct shaded fuelbreaks near Lower Trinity Mountain Road from Highway 299 to County Park.
3.6 miles long x 200 feet across = 87 acres

Lower Trinity Mtn. Rd.: Looking north. Note dead and down fuel from 2004 French Fire

#3 – Middle Trinity Mountain Road

- Vulnerable to wind-driven wildfires, fuels accumulation, and steep terrain;
- Protects rural residences; and
- Provides emergency ingress/egress.

Proposed Solution:
Construct shaded fuelbreaks along Middle Trinity Mountain Road from County Park to Trinity Mountain Road # 2 fuelbreak.
2.9 miles long x 200 feet across = 70 acres.

Middle Trinity Mountain Road

#4 – East Fork Road

- Vulnerable to wind-driven wildfires, fuels accumulation, and steep terrain; and
- Provides emergency ingress/egress.

Proposed Solution:
Maintain shaded fuelbreaks on the BLM lands along East Fork Road
3.5 miles long x 200 feet across = 85 acres

East Fork Road.
BLM land between two private parcels.

#5 – French Gulch School

- Threat of wildfire to the French Gulch School and nearby residences
- Vulnerable to wind-driven wildfires, fuels accumulation, and steep terrain;
- Protects rural residences; and
- Provides emergency ingress/egress.

Proposed Solution:
Construct shaded fuelbreaks across the road from the French Gulch Elementary School.
0.5 miles long x 200 feet across = 12 acres.

French Gulch School Fuelbreak

#6 – Highland Ridge Road

- Poor fire ingress and the threat of wildfire to residences along Highland Ridge Road;
- Vulnerable to wind-driven wildfires, fuels accumulation, and steep terrain;
- Protects rural residences; and
- Provides emergency ingress/egress.

Proposed Solution:
Construct shaded fuelbreaks east of Highland Ridge Road.
0.6 miles long x 200 feet wide = 15 acres.

Highland Ridge Fuelbreak: Note extremely dense chaparral and conifers

#7 – Upper-Middle Trinity Mountain Road

- Vulnerable to wind-driven wildfires, fuels accumulation, and steep terrain; and
- Provides emergency ingress/egress.

Proposed Solution:
Maintain shaded fuelbreak near Trinity Mountain Road and north of French Gulch.
2.2 miles long x 200 feet across = 53 acres

#8 – Dutch Gulch Ridge

- Vulnerable to wind-driven wildfires, fuels accumulation, and steep terrain;
- Protects rural residences; and
- Provides emergency ingress/egress.

Proposed Solution:
Construct shaded fuelbreaks along the east ridge of Dutch Gulch Ridge.
0.9 miles long x 200 feet = 22 acres

Dutch Gulch Ridgetop Fuelbreak. Note the extensive chaparral.

#9 – Summit Gulch

- Vulnerable to wind-driven wildfires, fuels accumulation, and steep terrain;
- Protects rural residences; and
- Provides emergency ingress/egress.

Proposed Solution:
Construct shaded fuelbreaks along the top of the east ridge of Summit Gulch.
2.3 miles long x 200 feet = 56 acres

Summit Gulch. Northwest end

Summit Gulch. Ridgetop along which fuelbreak would be constructed

#10 – Upper Trinity Mountain Road

- Vulnerable to wind-driven wildfires, fuels accumulation, and steep terrain;
- Protects residential subdivisions and mobile home park; and
- Provides emergency ingress/egress.

Proposed Solution:
Construct shaded fuelbreaks near the upper part of Trinity Mountain Road.
2.0 miles long x 200 feet = 48 acres

Upper Trinity Mountain Road.
Note the brush and trees to edge of road

#11 – Trinity Mountain Road West

- Vulnerable to wind-driven wildfires, fuels accumulation, and steep terrain;
- Provides emergency ingress/egress.

Proposed Solution:
Construct shaded fuelbreaks near the upper reaches of Trinity Mountain Road .
5.1 miles long x 200 feet across = 124 acres.

Trinity Mountain Road West.
Note the thick brush and trees to road edge.

#12 – Meisner Ranch

- Vulnerable to wind-driven wildfires, fuels accumulation, and steep terrain;
- Provides emergency ingress/egress.

Proposed Solution:
Construct shaded fuelbreaks near Highland Ridge, off of Highland Ridge Road.
0.6 miles long x 200 feet across = 15 acres.

#13 – Drunken Gulch

- Vulnerable to wind-driven wildfires, fuels accumulation, and steep terrain;
- Provides emergency ingress/egress.

Proposed Solution:
Construct shaded fuelbreaks near Drunken Gulch and Clear Creek.
0.7 miles long x 200 feet across = 17 acres.

#14 – Cline Gulch Road

- Vulnerable to wind-driven wildfires, fuels accumulation, and steep terrain;
- Protects rural residences; and
- Provides emergency ingress/egress.

Proposed Solution:
Construct shaded fuelbreaks near Cline Gulch Road.
2.1 miles long x 200 feet across = 51 acres.

II. COMMUNITY PRIORITIES

A. OVERALL COMMUNITY WILDFIRE RISK ASSESSMENT

FRENCH GULCH PLANNING AREA OVERALL COMMUNITY WILDFIRE RISK ASSESSMENT								
Community, structure or area at risk	**Map Number**	**Fuel Hazard**	**Wildfire Occurrence Risk**	**Structural Ignitability**	**Preparedness Capability**	**Overall Risk**	**Fire Hazard Severity Zone Rating**	**WUI**
Niagra Street	1	High	High	High	Low	High	Very High	Yes
Lower-Trinity Mountain Road	2	High	High	High	Low	High	Very High	Yes
Middle-Trinity Mountain Road	3	High	High	High	Low	High	Very High	Yes
East Fork Road	4	High	High	High	Low	High	Very High	Yes
French Gulch School	5	High	High	High	Low	High	Very High	Yes
Highland Ridge Road	6	High	High	High	Low	High	Very High	Yes
Upper-Middle Trinity Mountain Road	7	High	High	High	Low	High	Very High	Yes
Dutch Gulch	8	High	High	High	Low	High	Very High	Yes
Summit Gulch	9	High	High	High	Low	High	Very High	Yes
Upper-Trinity Mountain Road	10	High	High	High	Low	High	Very High	Yes
Trinity Mountain Road (west)	11	High	High	High	Low	High	Very High	Yes
Meisner Ranch	12	High	High	High	Low	High	Very High	Yes
Drunken Gulch	13	High	High	High	Low	High	Very High	Yes
Cline Gulch Road	14	High	High	High	Low	High	Very High	Yes

B. OVERALL COMMUNITY HAZARD REDUCTION ASSESSMENT

FRENCH GULCH PLANNING AREA OVERALL COMMUNITY HAZARD REDUCTION ASSESSMENT					
Community, structure or area at risk	**Map Number**	**Overall Risk**	**Cultural Value**	**Treatment Type**	**Treatment Method**
Niagra Street	1	High	Low	Fuelbreak	Brush and tree removal, pruning
Lower-Trinity Mountain Road	2	High	Low	Fuelbreak	Brush and tree removal, pruning
Middle-Trinity Mountain Road	3	High	Low	Fuelbreak	Brush and tree removal, pruning
East Fork Road	4	High	Low	Fuelbreak	Brush and tree removal, pruning
French Gulch School	5	High	Low	Fuelbreak	Brush and tree removal, pruning
Highland Ridge Road	6	High	Low	Fuelbreak	Brush and tree removal, pruning
Upper-Middle Trinity Mountain Road	7	High	Low	Fuelbreak	Brush and tree removal, pruning
Dutch Gulch	8	High	Low	Fuelbreak	Brush and tree removal, pruning
Summit Gulch	9	High	Low	Fuelbreak	Brush and tree removal, pruning
Upper-Trinity Mountain Road	10	High	Low	Fuelbreak	Brush and tree removal, pruning
Trinity Mountain Road (west)	11	High	Low	Fuelbreak	Brush and tree removal, pruning
Meisner Ranch	12	High	Low	Fuelbreak	Brush and tree removal, pruning
Drunken Gulch	13	High	Low	Fuelbreak	Brush and tree removal, pruning
Cline Gulch Road	14	High	Low	Fuelbreak	Brush and tree removal, pruning

III. COMMUNITY VALUES

RESIDENCES AND MAJOR STRUCTURES

French Gulch is nestled in the valley of the Upper Clear Creek Watershed.
About 250 homes and 650 people make up the community of French Gulch and the surrounding area. Major structures include the store, post office, hotel, school, and bar.

The French Gulch General Store is next to the post office. The general store was the only retail outlet in the village but is now closed.

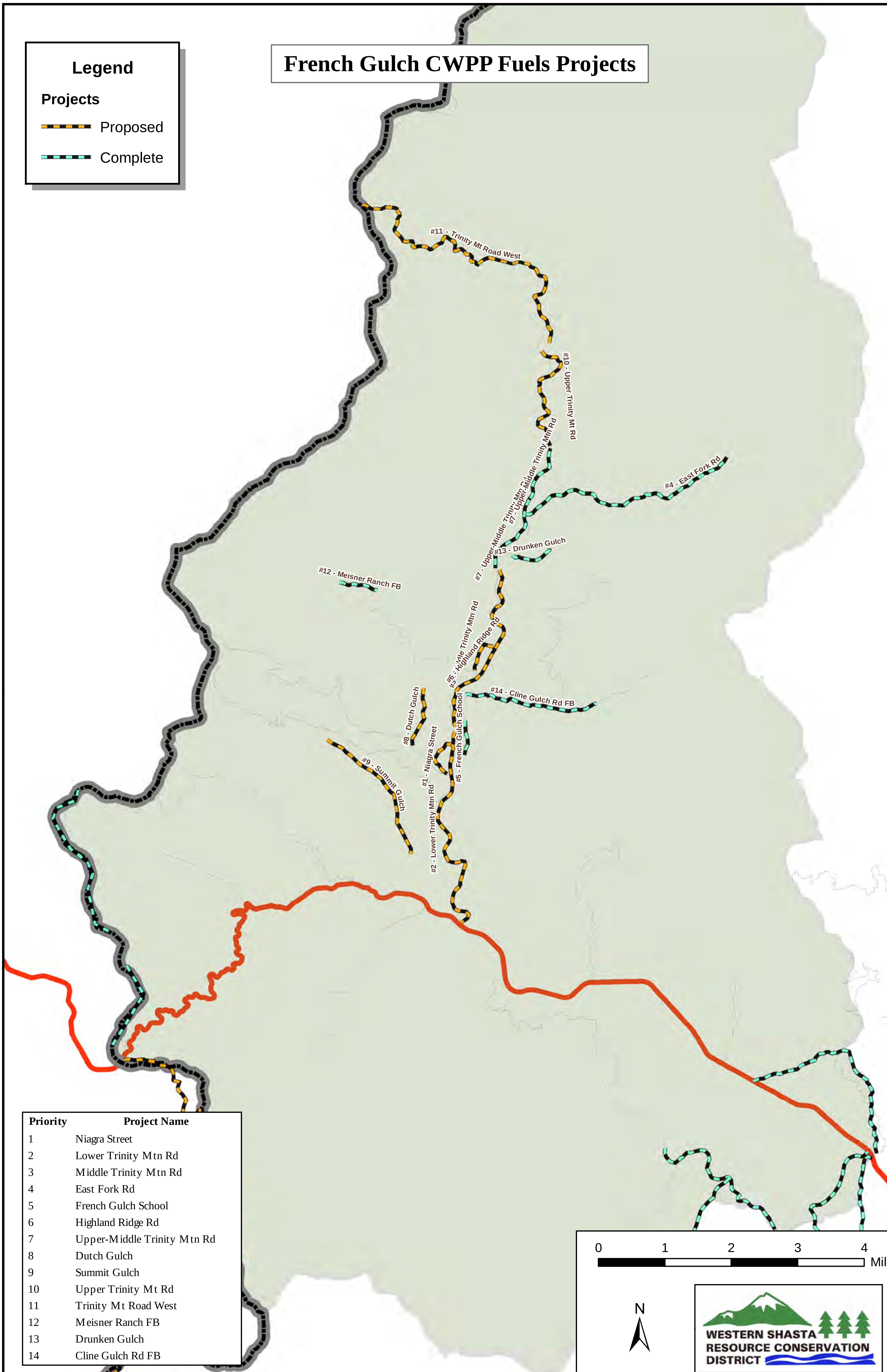
Modern day French Gulch is home to the historic French Gulch Hotel, established in 1885. The hotel has seven rooms and functions as a bed and breakfast.

Directly across the street from the hotel is a bar called E. Franck & Co., known to the locals as Johnnie's. Like the hotel, this is one of the remaining historical buildings in French Gulch.

MAPS OF FRENCH GULCH PLANNING AREA

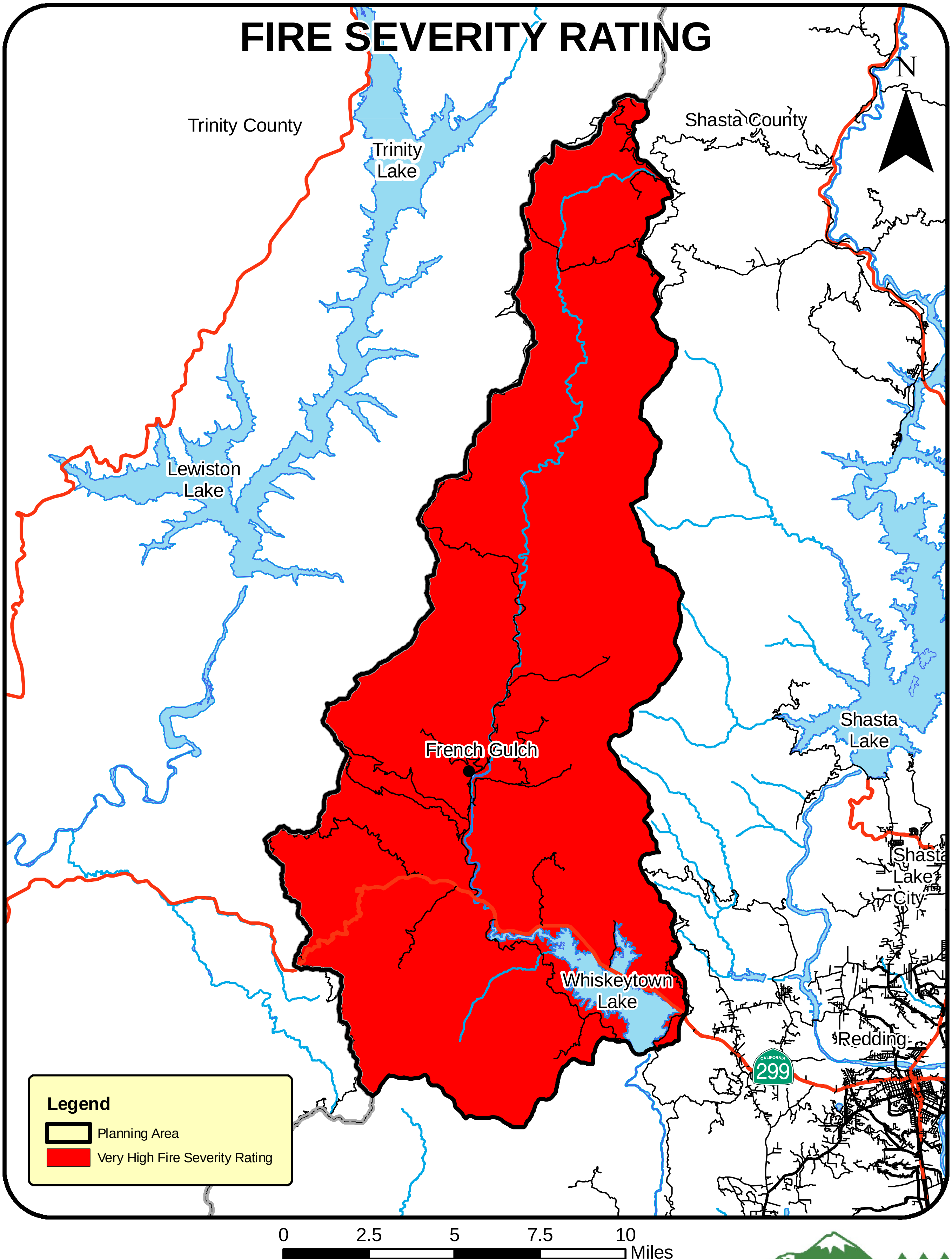
1. FRENCH GULCH PROPOSED PROJECTS AND PLANNING AREA
2. FIRE SEVERITY RATING
3. VEGETATION
4. SPECIAL STATUS SPECIES AND HABITAT

MAP 1



Priority	Project Name
1	Niagra Street
2	Lower Trinity Mtn Rd
3	Middle Trinity Mtn Rd
4	East Fork Rd
5	French Gulch School
6	Highland Ridge Rd
7	Upper-Middle Trinity Mtn Rd
8	Dutch Gulch
9	Summit Gulch
10	Upper Trinity Mt Rd
11	Trinity Mt Road West
12	Meisner Ranch FB
13	Drunken Gulch
14	Cline Gulch Rd FB

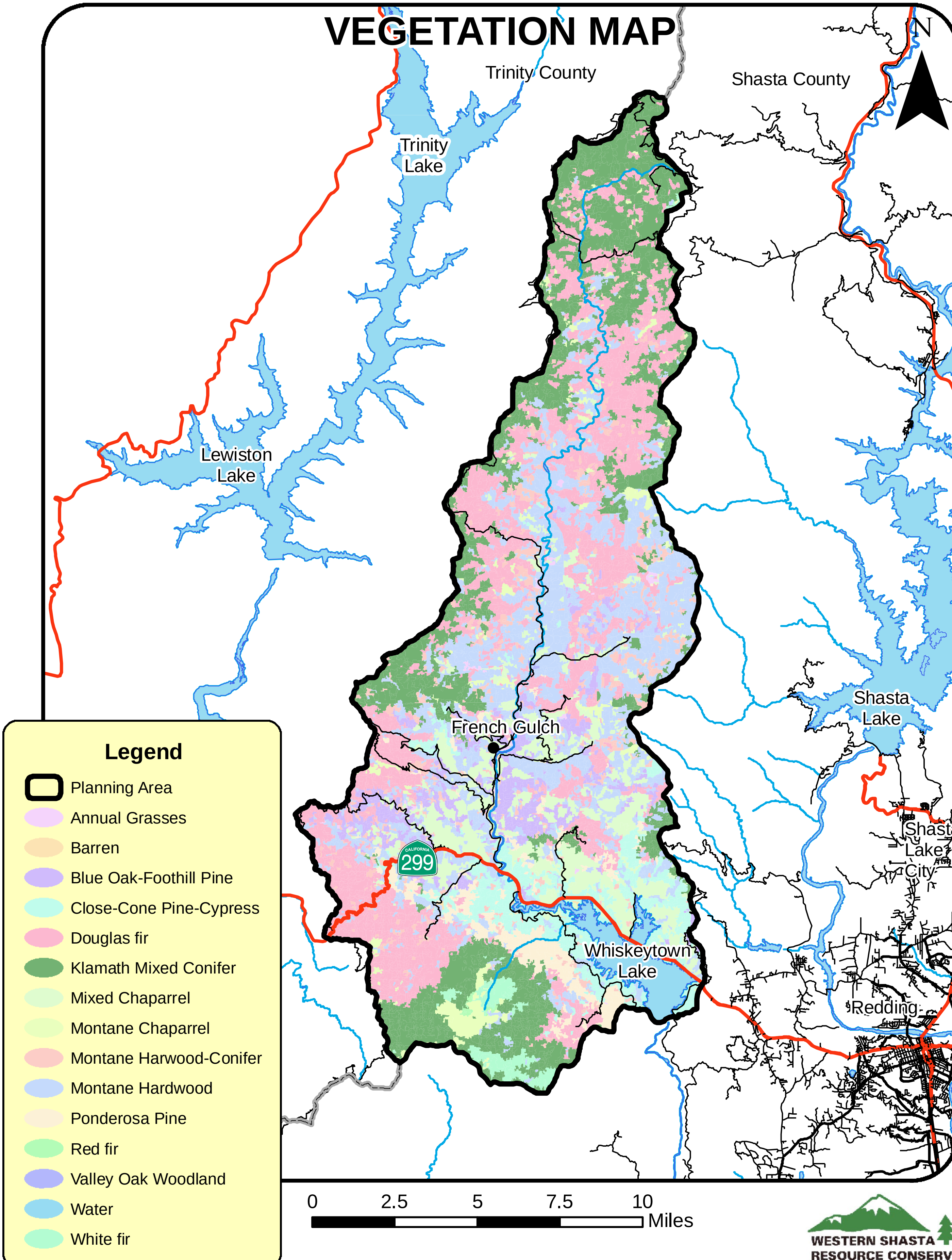
MAP 2



VERY HIGH FIRE HAZARD SEVERITY ZONE
as Recommended by CAL FIRE

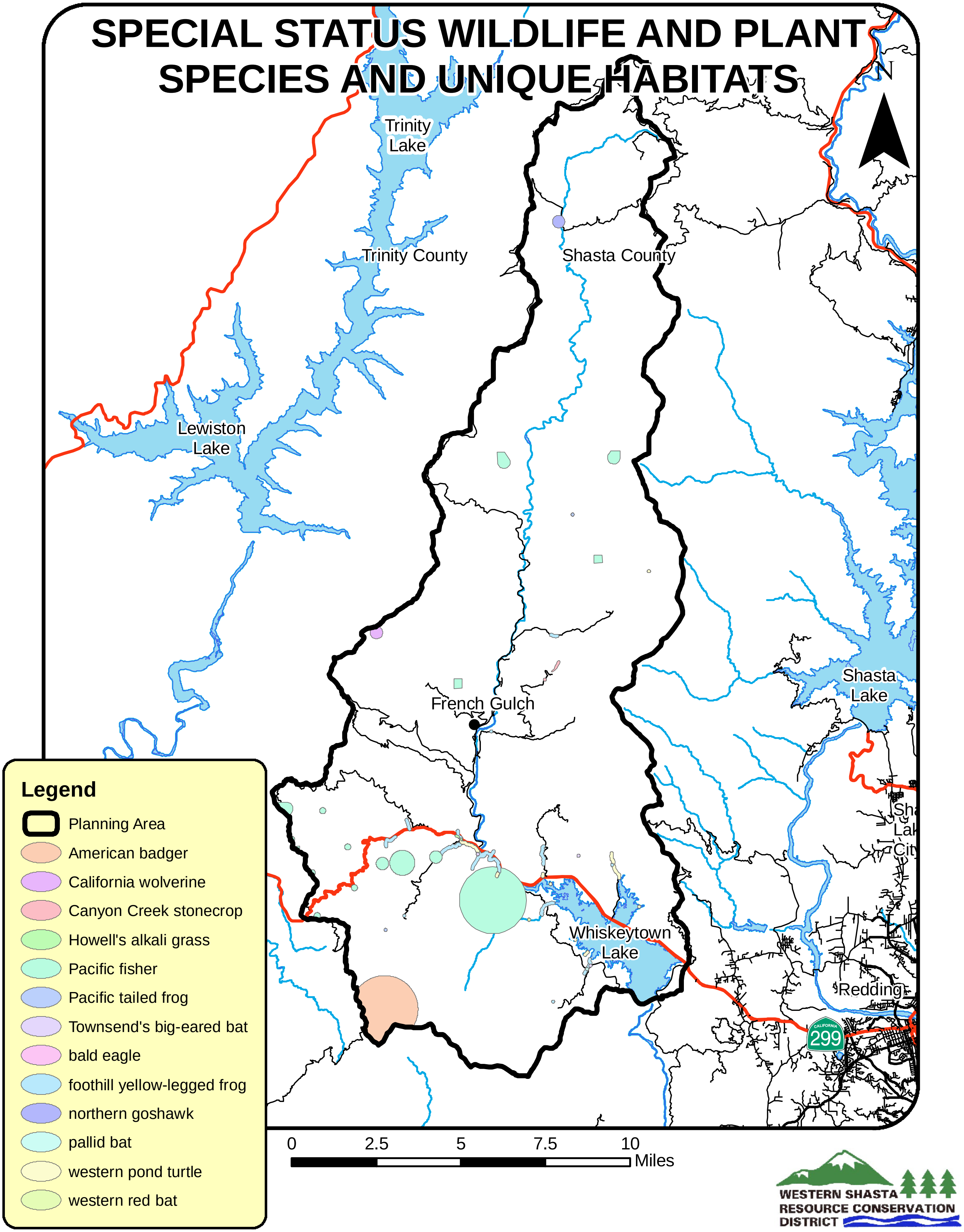
WESTERN SHASTA RESOURCE CONSERVATION DISTRICT

MAP 3



WESTERN SHASTA RESOURCE CONSERVATION DISTRICT

MAP 4


SPECIAL STATUS WILDLIFE AND PLANT SPECIES AND UNIQUE HABITATS
N
Trinity Lake
Trinity County
Shasta County
Lewiston Lake
French Gulch
Shasta Lake
Whiskeytown Lake
Redding
299
Legend
Planning Area
American badger
California wolverine
Canyon Creek stonecrop
Howell's alkali grass
Pacific fisher
Pacific tailed frog
Townsend's big-eared bat
bald eagle
foothill yellow-legged frog
northern goshawk
pallid bat
western pond turtle
western red bat
0
2.5
5
7.5
10
Miles
WESTERN SHASTA RESOURCE CONSERVATION DISTRICT

2016
SHASTA COUNTY
COMMUNITY WILDFIRE PROTECTION PLAN

KESWICK BASIN
PLANNING AREA

Covering the communities of:

- Keswick
- Northwest Redding
- Western City of Shasta Lake
- Buckeye

KESWICK BASIN PLANNING AREA
(2016)

I. PROPOSED PROJECTS

A. THE PLANNING AREA

Wildfire plays a natural part in the evolution of vegetation in the 30,814-acre Keswick Basin planning area, located northwest of Redding, California. The topography of the Keswick Basin planning area varies from steep to valley floor, with elevations from 3,913 feet at Sugar Loaf Mountain to 600 feet at the Sacramento River. The land ownership in the area is intermingled public lands (BLM, BOR, NPS and USFS) and private lands. Ownership is roughly 54% private and 46% public. The area west of the Sacramento River is largely undeveloped. During the late 1800's and early 1900's, mining dominated the activity in the area; however, there are no active mines today. The area contains a large relic of the mining era as a Superfund site, Iron Mountain Mine. Natural and man-made features have been used to define the planning area boundary on the map (e.g. highways, streets, ridgelines, rivers, etc.)

When reviewed together, the Keswick Basin has an area that has an extremely high potential for catastrophic wildfire. In 2008, a massive lighting storm started the Motion Fire (26,824 acres), which began within the planning area near Shasta Dam, the Moon Fire (29,031 acres), and the Deer Lick Fire (12,701 acres). These fires burned for weeks and consumed a total of 68,556 acres in Western Shasta County. These fires were part of the larger Shasta-Trinity Lightning Complex of 158 fires which burned a total of 86,500 acres.

West of the Sacramento River, the population is concentrated in the community of Keswick with an estimated population of 327 residents. The remainder of the area is sparsely populated with 9 residents. Higher population densities exist east of the Sacramento River within the planning area. Population densities vary from scattered in rural areas to high in neighborhoods within the cities of Redding and Shasta Lake and intermingled areas of Shasta County. Population for the eastside of the planning area is estimated to be 1,730 residents.

Northern California has a Mediterranean climate characterized by long, dry, hot summers and wet winters. Mean annual precipitation ranges from 25 inches in the valley to 40 inches in the higher elevations, some of this coming as snow. The mean annual air temperature ranges from 57 to 65 degrees Fahrenheit.

B. PROJECT PRIORITIES

KESWICK BASIN PLANNING AREA FUEL REDUCTION PROJECTS				
PROPOSED PROJECT	**MAP NUMBER**[1]	**TYPE**	**AREA (acres)**	**ESTIMATED COST**[2]
Iron Mountain Rd (Central)	1	Fuelbreak	27	$139,200
Keswick Dam Road	2	Fuelbreak	41	$215,127
Magees Acres	3	Fuelbreak	15	$75,927
Lake Blvd.	4	Fuelbreak	184	$961,745
Quartz Hill Road North	5	Fuelbreak	34	$177,164
Keswick Community East	6	Fuelbreak	27	$139,200
Walker Mine Road	7	Fuelbreak	33	$170,836
Flanagan Road	8	Fuelbreak	13	$69,600
Macs Road	9	Fuelbreak	10	$50,618
Bailey Road	10	Fuelbreak	7	$37,964
Upper Buenaventura Blvd	11	Fuelbreak	17	$88,582
Iron Mountain Rd North	12	Fuelbreak	73	$379,636
Shasta Dam Blvd (HWY 151)	13	Fuelbreak	90	$468,218

The identified fuel reduction projects fall into two categories:

1. defensible space for homes and structures, and
2. roadside and ridgeline shaded fuelbreaks intended to create safe ingress and egress for fire personnel and escape routes for residents.

Projects were prioritized based on need and factors such as the following:

- Protection of private residences and properties;
- Access or escape route for the public and fire suppression forces;
- Identification of staging areas in conjunction with the fuelbreak development to provide fire suppression forces strategic locations for planning fire management and suppression actions.
- Connections to other fuelbreaks or areas of lower risk.

Landowners and residents are strongly encouraged to develop defensible space or maintain the fuels reduction projects on their properties to keep the integrity of the work done and to show project sustainability which could lead to additional future projects.

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[1] Proposed projects are numbered on the map according to priority.
[2] Estimated costs of the projects are for planning only. More accurate costs will be determined for the preparation of project proposals.

KESWICK BASIN PLANNING AREA BASIC ASSUMPTIONS[3]	
Estimated cost of fuelbreak (roadside)	$5,220 per acre
Estimated cost of fuelbreak (ridgetop or off-road)	$7,310 per acre
Estimated cost of defensible space (hand labor)	$600 per dwelling (<1 acre)
Standard fuelbreak width	200 feet
Population	2.6 per dwelling
Property Value (~ $201,250 - $475,000 per dwelling)	$260,000
Schools	$145,000,000
Commercial Structures Value[4]	$415,500 – $23,900,000
Power lines	$250,000/mile

Overall Concern – Lack of Defensible Space in Keswick Basin community.
Proposed Solution: Encourage the development of a defensible space/Firewise Program for the community of Keswick

Residence in Keswick lacking defensible space.

[3] Estimated costs of the projects are for planning only. More accurate costs will be determined for the preparation of project proposals.
[4] County assessed values, 2010

#1 – Iron Mountain Road (central)

- Provides important access for fire suppression forces in this portion of the watershed;
- Connects the community of Keswick to CA-299, which is the primary road for residents and emergency crews.

Proposed Solution:

Construct shaded fuelbreaks along Iron Mountain Road from Keswick Dam Road to South Spring Creek.
1.1 miles long x 200 feet on each side = 27 acres.

A fire along Iron Mountain Road. Most of the vegetation in the area, such as manzanita and toyon, is highly flammable.

#2 – Keswick Dam Road

- Provides important emergency ingress and egress; and
- Protects the community of Keswick from southern fires.

Proposed Solution:

Construct shaded fuelbreaks near Keswick Dam Road, east from Iron Mountain Road.
1.7 miles long x 200 feet = 41 acres.

Keswick Dam Road
Note tree overstory to edge of road

#3 – Magees Acres

- Provides important access for fire suppression forces; and
- Protects the rural community and high-voltage powerlines between the Sacramento River and Quartz Hill Road.

Proposed Solution:

Construct shaded fuelbreak near Magees Acres Way, west of Quartz Hill Road. 0.6 miles long x 200 feet = 15 acres.

Magees Acres Way. Note the trees and brush up to edge of pavement

#4 – Lake Blvd

- Provides important access for fire suppression forces; and
- Protects residential properties and high-voltage powerlines between the Sacramento River and Lake Blvd.

Proposed Solution:

Construct shaded fuelbreaks behind properties on the west side of Lake Blvd. 7.6 miles long x 200 feet = 184 acres.

Lake Boulevard north of Highway 151
Note dense brush and trees up to edge of pavement.

Lake Boulevard.
Note dense brush and trees up to pavement edge

#5 – Quartz Hill Road North

- Provides important access for fire suppression forces;
- Connects residents to Lake Blvd; and
- Protects residential properties and high-voltage powerlines between the Sacramento River and Lake Blvd.

Proposed Solution:

Construct shaded fuelbreaks near Quartz Hill Road, connecting to the high-voltage powerlines.
1.4 miles long x 200 feet = 34 acres.

Quartz Hill Road. Note tree overstory over pavement

#6 – Keswick Community East

- Provides important access for fire suppression forces; and
- Protects the community of Keswick.

Proposed Solution:

Construct shaded fuelbreaks near around the eastern edge of Keswick.
1.1 miles long x 200 feet = 27 acres.

*East of Keswick.
Note dense brush up
to road edge*

*East Keswick
Note home barely
visible in left center*

#7 – Walker Mine Road

- Provides important access for fire suppression forces; and
- Protects the rural properties west of Lake Blvd.

Proposed Solution:

Construct shaded fuelbreaks to the right-of-way along Walker Mine Road.
2.7 miles long x 100 feet or to the right-of-way = 33 acres.

Walker Mine Road. Note dense brush and trees up to road edge.

#8 – Flanagan Road

- Provides important access for fire suppression forces; and
- Protects the rural properties west of Lake Blvd.

Proposed Solution:

Construct shaded fuelbreaks to the right-of-way along Flanagan Road.
1.1 miles long x 100 feet or to the right-of-way = 13 acres.

Flanagan Road. Note the dense brush and trees up to edge of pavement.
This is similar to Walker Mine Road, Macs Road, and Bailey Road.

#9 – Macs Road

- Provides important access for fire suppression forces; and
- Protects the rural properties west of Lake Blvd.

Proposed Solution:

Construct shaded fuelbreaks to the right-of-way along Macs Road.
0.8 miles long x 100 feet or to the right-of-way = 10 acres.

Macs Road
Note dense brush and trees up to single lane road edge

#10 – Bailey Road

- Provides important access for fire suppression forces; and
- Protects the rural properties west of Lake Blvd.

Proposed Solution:

Construct shaded fuelbreaks to the right-of-way along Bailey Road.
0.6 miles long x 100 feet or to the right-of-way = 7 acres.

Bailey Road. Note dense brush and trees to pavement edge.

#11 – Upper Buenaventura

- Provides important access for fire suppression forces; and
- Connects the Land Park and Stanford Hills subdivisions to a main transportation route.

Proposed Solution:

Construct shaded fuelbreaks near Buenaventura Blvd and Keswick Dam Blvd. 0.7 miles long x 200 feet = 17 acres.

Buenaventura Boulevard (south of Keswick Dam).
Note dense brush and trees up to road edge on left side

#12 – Iron Mountain Road North

- Provides important access for fire suppression forces; and
- Protects the community of Keswick.

Proposed Solution:

Construct shaded fuelbreaks near Iron Mountain Road.
3.0 miles long x 200 feet = 73 acres.

Iron Mountain Road. Note the dense brush and trees up to road edge.

#13 – HWY-151 (Shasta Dam Blvd)

- Allows ingress/egress between Shasta Dam and Interstate-5;
- Provides important access for fire suppression forces; and
- Protects the community of the City of Shasta Lake.

Proposed Solution:

Construct shaded fuelbreaks along HWY-151.

3.7 miles long x 100 feet to the right-of-way = 45 acres.

HWY-151. Note dense vegetation

Demonstration shaded fuel break at Toyon in City of Shasta Lake

II. COMMUNITY PRIORITIES

A. OVERALL COMMUNITY WILDFIRE RISK ASSESSMENT

KESWICK BASIN PLANNING AREA
OVERALL COMMUNITY WILDFIRE RISK ASSESSMENT

Community, structure or area at risk	Map Number	Fuel Hazard	Wildfire Occurrence Risk	Structural Ignitability	Preparedness Capability	Overall Risk	Fire Hazard Severity Zone Rating	WUI
Iron Mountain Road (central)	1	High	High	High	Low	High	Very High	Yes
Keswick Dam Road	2	High	High	High	Low	High	Very High	Yes
Magees Acres	3	High	High	High	Low	High	Very High	Yes
Lake Blvd	4	High	High	High	Low	High	Very High	Yes
Quartz Hill Rd (north)	5	High	High	High	Low	High	Very High	Yes
Keswick Community East	6	High	High	High	Low	High	Very High	Yes
Walker Mine Road	7	High	High	High	Low	High	Very High	Yes
Flanagan Road	8	High	High	High	Low	High	Very High	Yes
Macs Road	9	High	High	High	Low	High	Very High	Yes
Bailey Road	10	High	High	High	Low	High	Very High	Yes
Upper Buenaventura	11	High	High	High	Low	High	Very High	Yes
Iron Mountain Rd (north)	12	High	High	High	Low	High	Very High	Yes
HWY-151 (Shasta Dam Blvd)	13	High	High	High	Low	High	Very High	Yes

B. OVERALL COMMUNITY HAZARD REDUCTION ASSESSMENT

KESWICK BASIN PLANNING AREA
OVERALL COMMUNITY HAZARD REDUCTION ASSESSMENT

Community, structure or area at risk	Map Number	Overall Risk	Cultural Value	Treatment Type	Treatment Method
Iron Mountain Road (central)	1	High	Low	Fuelbreak	Brush and tree removal, pruning
Keswick Dam Road	2	High	Low	Fuelbreak	Brush and tree removal, pruning
Magees Acres	3	High	Low	Fuelbreak	Brush and tree removal, pruning
Lake Blvd	4	High	Low	Fuelbreak	Brush and tree removal, pruning
Quartz Hill Rd (north)	5	High	Low	Fuelbreak	Brush and tree removal, pruning
Keswick Community East	6	High	Low	Fuelbreak	Brush and tree removal, pruning
Walker Mine Road	7	High	Low	Right-Of-Way	Brush and tree removal, pruning
Flanagan Road	8	High	Low	Right-Of-Way	Brush and tree removal, pruning
Macs Road	9	High	Low	Right-Of-Way	Brush and tree removal, pruning
Bailey Road	10	High	Low	Right-Of-Way	Brush and tree removal, pruning
Upper Buenaventura	11	High	Low	Fuelbreak	Brush and tree removal, pruning
Iron Mountain Rd (north)	12	High	Low	Fuelbreak	Brush and tree removal, pruning
HWY-151 (Shasta Dam Blvd)	13	High	Low	Fuelbreak	Brush and tree removal, pruning

III. COMMUNITY VALUES

RESIDENCES AND MAJOR STRUCTURES

About 954 homes are found within the Keswick Basin planning area. Major structures include stores, schools, powerlines, substations, and fire stations. Areas of community importance include: Whiskeytown National Recreation Area, Old Shasta State Park, Keswick Volunteer Fire Company Station #53, CAL FIRE Station #58, Chappie OHV Areas facilities, and public shooting ranges, Centimudi Bay Marina.

Toyon Learning Center

Baptist Church

WAPA Powerlines

Antiques Business

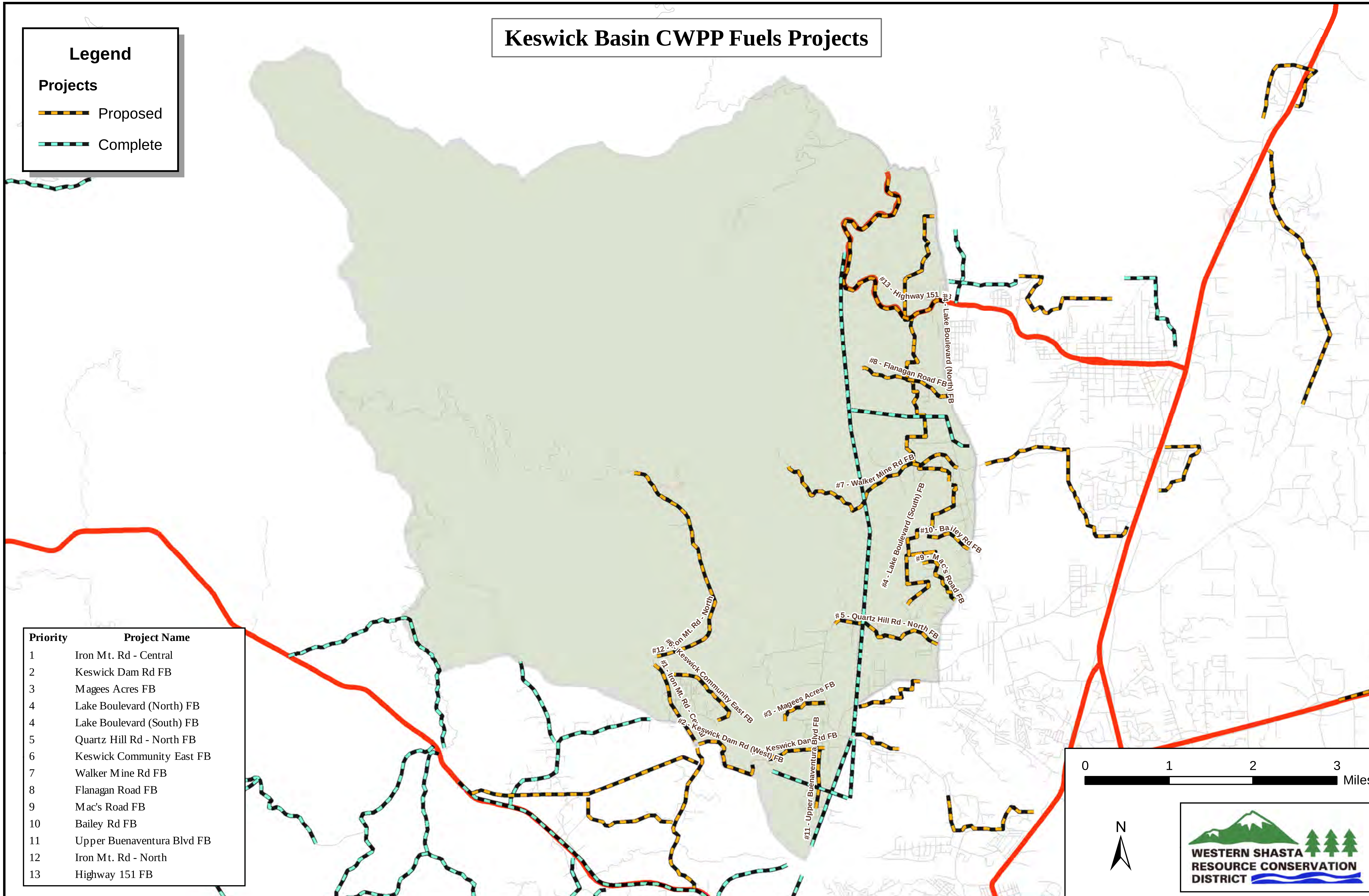
City of Shasta Lake Substation

SLFPD Fire Station

MAPS OF KESWICK BASIN PLANNING AREA

1. KESWICK BASIN PROPOSED PROJECTS AND PLANNING AREA
2. FIRE SEVERITY RATING
3. VEGETATION
4. SPECIAL STATUS SPECIES AND HABITAT

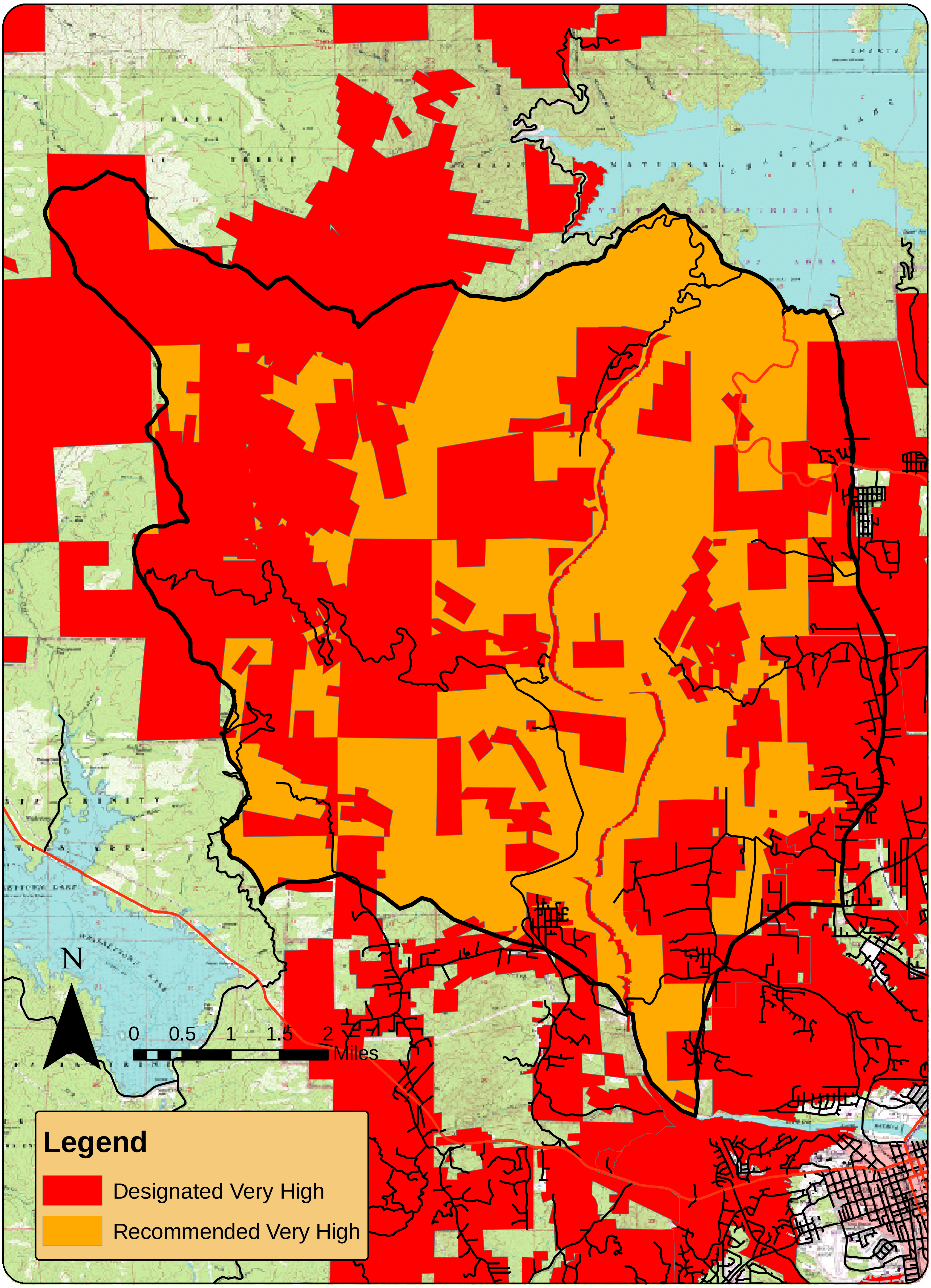
MAP 1



Keswick Basin CWPP Fuels Projects
Legend
Projects
Proposed
Complete
Priority Project Name
1 Iron Mt. Rd - Central
2 Keswick Dam Rd FB
3 Magees Acres FB
4 Lake Boulevard (North) FB
4 Lake Boulevard (South) FB
5 Quartz Hill Rd - North FB
6 Keswick Community East FB
7 Walker Mine Rd FB
8 Flanagan Road FB
9 Mac's Road FB
10 Bailey Rd FB
11 Upper Buenaventura Blvd FB
12 Iron Mt. Rd - North
13 Highway 151 FB
#13 - Highway 151
#4 - Lake Boulevard (North) FB
#8 - Flanagan Road FB
#7 - Walker Mine Rd FB
#4 - Lake Boulevard (South) FB
#10 - Bailey Rd FB
#9 - Mac's Road FB
#5 - Quartz Hill Rd - North FB
#3 - Magees Acres FB
#6 - Keswick Community East FB
#2 - Keswick Dam Rd (West) FB
Keswick Dam Blvd FB
#11 - Upper Buenaventura Blvd FB
0 1 2 3
Miles
N
WESTERN SHASTA RESOURCE CONSERVATION DISTRICT

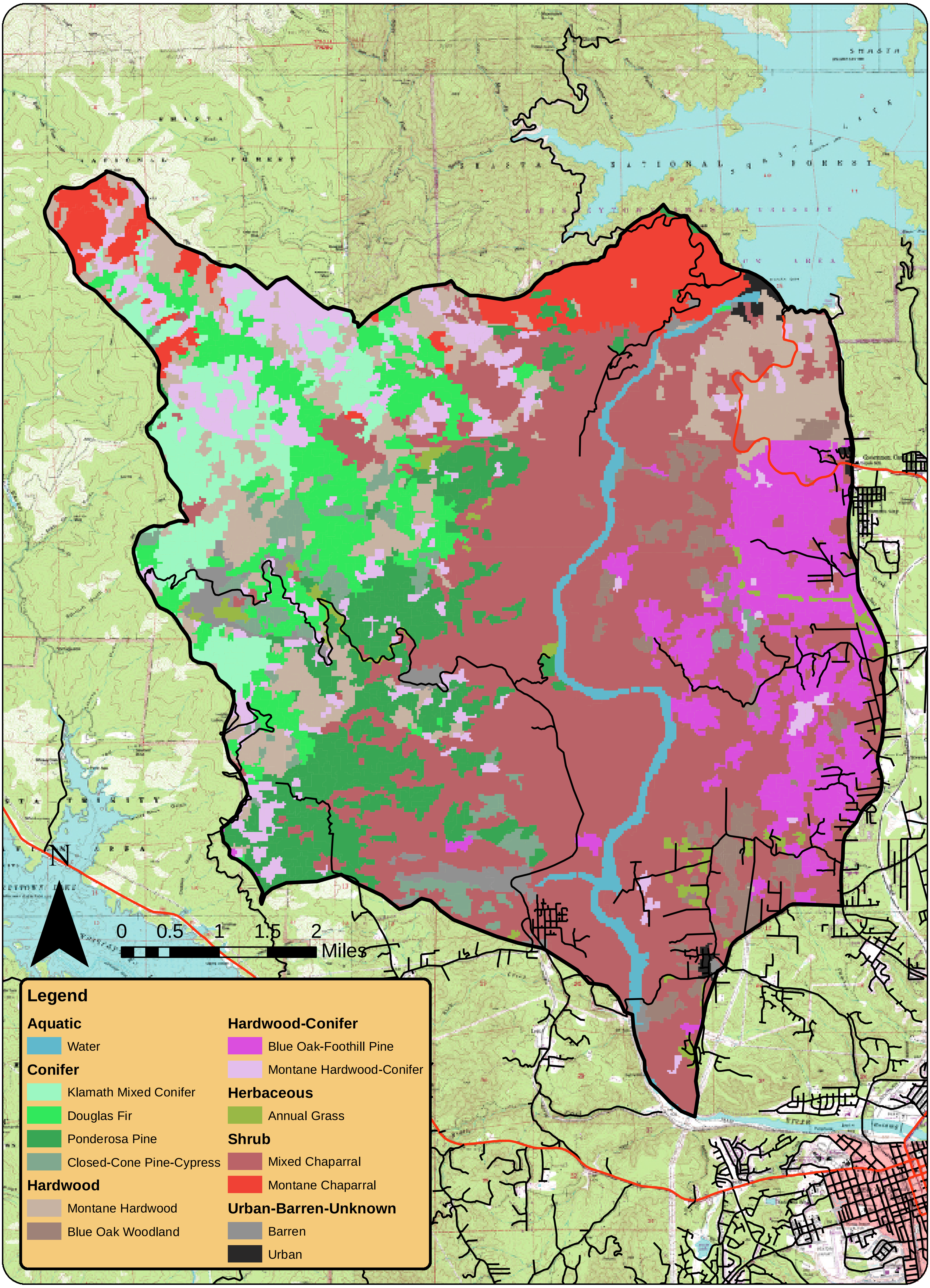
MAP 2

Keswick Basin - Fuel Hazard Severity Zone Rating*



* Cal Fire Rating

MAP 3
Keswick Basin - General Vegetation



MAP 4
Keswick Basin - CNDDB

2016
SHASTA COUNTY
COMMUNITY WILDFIRE PROTECTION PLAN

LAKEHEAD
PLANNING AREA

Picture courtesy of Lee Delaney

Covering the communities of:

- Delta
- Gibson
- Gilman Road
- Gregory Creek
- Highland Lakes
- Lakehead
- Lakeshore
- Lakeview
- LaMoine
- Northwoods
- O'Brien Mountain
- Skyline Drive
- Statton
- Sugarloaf
- Vollmers

LAKEHEAD PLANNING AREA
(2016)

I. PROPOSED PROJECTS

A. THE PLANNING AREA

The planning area covers about 500 square miles or approximately 320,000 acres, 26 miles north of Redding, California. Access to the area is via Interstate 5, Shasta Lake, and several Forest Service roads. The communities within the Lakehead Planning Area include: Gregory Creek, Obrien Mountain, Northwoods, LaMoine, Vollmers, Delta, Lakehead, Lakeshore, Statton, Skyline Drive, Lakeview, Sugarloaf, Gibson, Highland Lakes, and Gilman Road area. The area has a population of about 1618 permanent residents (Sperling' Best Places, 2009), and about 256 seasonal/recreational residences spread throughout the Planning Area. With the presence of Shasta Lake National Recreation Area (NRA), the area is heavily used for recreation. Land ownership is 56% public and 44% private.

The topography of the area is steep, with elevations from 1,065 to 5,613 feet, draining into Upper Sacramento River and McCloud River and eventually flowing into Shasta Lake. The area has remained relatively undeveloped over time and provides high quality water for the Central Valley Project, which supplies water throughout the state. Generally, the climate of the Lakehead FSC Area is seasonal and varies with elevation. The summers are hot and dry and winters are cool with moderate rainfall, and snow above 4,000 feet elevation. The average annual precipitation in the Sacramento River Basin varies from a low of 30 inches north of Mount Shasta City, to a high of 80 inches near High Mountain.

B. PROJECT PRIORITIES

The identified fuel reduction projects fall into two categories:

1. defensible space for homes and structures, and
2. roadside and ridgeline shaded fuelbreaks intended to create safe ingress and egress for fire personnel and escape routes for residents.

Projects were prioritized based on need and factors such as the following:

- Protection of private residences and properties;
- Access or escape route for the public and fire suppression forces;
- Identification of staging areas in conjunction with the fuelbreak development to provide fire suppression forces strategic locations for planning fire management and suppression actions.
- Connections to other fuelbreaks or areas of lower risk.

Landowners and residents are strongly encouraged to develop defensible space or maintain the fuels reduction projects on their properties to keep the integrity of the work done and to show project sustainability which could lead to additional future projects.

LAKEHEAD PLANNING AREA FUEL REDUCTION PROJECTS				
PROPOSED PROJECT	**MAP NUMBER**[1]	**TYPE**	**AREA (acres)**	**ESTIMATED COST**[2]
Lakeshore Drive	1	Fuelbreak	157	$820,015
Northwoods	2	Fuelbreak	29	$151,855
Dog Creek	3	Fuelbreak	75	$392,291
Lakeside Woods Subdivision	4	Fuelbreak	12	$63,273
Slate Creek	5	Fuelbreak	39	$202,473
Old Mill Road	6	Fuelbreak	70	$366,982
Waterman Road	7	Fuelbreak	17	$88,582
Sims Road	8	Fuelbreak	75	$392,291
Lakehead-Riverview Drive	9	Fuelbreak	19	$101,236
Skyline Subdivision	10	Fuelbreak	131	$683,345
Holiday Harbor	11	Fuelbreak	46	$240,436
Packers Bay	12	Fuelbreak	17	$88,582
Gregory Creek Drainage	13	Fuelbreak	116	$607,418
O'Brian Mountain Estates	14	Fuelbreak	208	$1,088,291
Lower Salt Creek Road	15	Fuelbreak	29	$151,855
Snowbird Lane	16	Fuelbreak	12	$63,273
Gilman Road	17	Fuelbreak	97	$506,000
Top of the Hill	18	Fuelbreak	10	$50,618
Statton Road	19	Fuelbreak	34	$177,164
Pollard Flat	20	Fuelbreak	24	$126,545
Lakeview Heights	21	Fuelbreak	17	$88,582
Delta/Volmers	22	Fuelbreak	27	$139,200
Hirz Mtn. Lookout Road	23	Fuelbreak	61	$316,364
Shasta Marina	24	Fuelbreak	10	$50,618
Gibson Road	25	Fuelbreak	63	$329,018
Sugarloaf Subdivision	26	Fuelbreak	51	$265,745
Highland Lakes	27	Fuelbreak	78	$404,945
Sugarloaf NE Ridge	28	Fuelbreak	29	$151,855
Sugarloaf Lookout Road	29	Fuelbreak	56	$291,055

[1] Proposed projects are numbered on the map according to priority.
[2] Estimated costs of the projects are for planning purposes only. More accurate costs will be determined for the preparation of project proposals.

LAKEHEAD PLANNING AREA BASIC ASSUMPTIONS[3]	
Estimated cost of fuelbreak (roadside)	$5,220 per acre
Estimated cost of fuelbreak (ridgetop or off-road)	$7,310 per acre
Estimated cost of defensible space (hand labor)	$600 per dwelling (<1 acre)
Standard fuelbreak width	200 feet
Population	2.6 per dwelling
Property Value (~ $201,250 - $475,000 per dwelling)	$260,000
Schools	$145,000,000
Commercial Structures Value[4]	$415,500 – $23,900,000
Power line	$250,000/mile

#1 – Lakeshore Drive

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Construct shaded fuelbreaks near Lakeshore Drive.
6.5 miles long x 200 feet across = 157 acres.


Vegetation along Lakeshore Drive north of the Antlers freeway exit

[3] Estimated costs of the projects are for planning purposes only. More accurate costs will be determined for the preparation of project proposals.
[4] County assessed values, 2010

#2 – Northwoods

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain; and
- Provides emergency ingress/ egress;

Proposed Solution:
Construct shaded fuelbreak near the Northwoods.
1.2 miles long x 200 feet across = 29 acres.

#3 – Dog Creek

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Construct shaded fuelbreak near Lakeshore Drive.
3.1 miles long x 200 feet across = 75 acres.

Vegetation along Dog Creek Road

#4 – Lakeside Woods Subdivision

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Maintain shaded fuelbreak near the Lakeside Woods Subdivision .
0.5 miles long x 200 feet across = 12 acres.

#5 – Slate Creek

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Construct shaded fuelbreaks near Slate Creek.
1.6 miles long x 200 feet across = 39 acres.

Vegetation along Slate Creek Road

#6 – Old Mill Road

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Construct shaded fuelbreaks near Old Mill Road.
2.9 miles long x 200 feet across = 70 acres.

Old Mill Road showing the narrow road, steep canyon, and brush encroachment

#7 – Waterman Road

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Construct shaded fuelbreaks near Waterman Road.
0.7 miles long x 200 feet across = 17 acres.

Waterman Road Showing Brush Encroachment

#8 – Sims Road

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Construct shaded fuelbreaks near Sims Road.
3.1 miles long x 200 feet across = 75 acres.

Mears Ridge Road north of the intersection with Sims Road.

#9 – Lakehead-Riverview Drive

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Construct shaded fuelbreaks near Lakehead-Riverview Drive.
0.8 miles long x 200 feet across = 19 acres.

Riverview Drive north of Lakehead

#10 – Skyline Subdivision

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Construct shaded fuelbreaks near the Skyline Subdivision.
5.4 miles long x 200 feet across = 131 acres.

Skyline Drive showing over grown conditions

#11 – Holiday Harbor

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Construct shaded fuelbreaks near the Holiday Harbor marina.
1.9 miles long x 200 feet across = 46 acres.

#12 – Packers Bay

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Construct shaded fuelbreak near the Packers Bay marina.
0.7 miles long x 200 feet across = 17 acres.

#13 – Gregory Creek Drainage

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Maintain shaded fuelbreaks near the Gregory Creek Drainage.
4.8 miles long x 200 feet across = 116 acres.

Zola Drive showing the narrow road, steep terrain, and vegetation encroachment

#14 – O'Brien Mountain Estates

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Herman Way showing the steepness of slope

Proposed Solution:
Maintain shaded fuelbreaks near the O'Brien Mountain Estates subdivision.
8.6 miles long x 200 feet across = 208 acres.

#15 – Lower Salt Creek Road

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Note brush encroachment on Lower Salt Creek

Proposed Solution:
Maintain shaded fuelbreaks near Lower Salt Creek Road and Kamloop Road.
1.2 miles long x 200 feet across = 29 acres.

#16 – Snowbird Lane

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Entrance to Snowbird Lane

Proposed Solution:
Construct a shaded fuelbreak on and/or near Snowbird Lane, possibly along the ridge to the south.
0.5 miles long x 200 feet across = 12 acres.

#17 – Gilman Road

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Will need cooperative efforts between SPI, STNF, Shasta County Public Works, and private landowners.
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

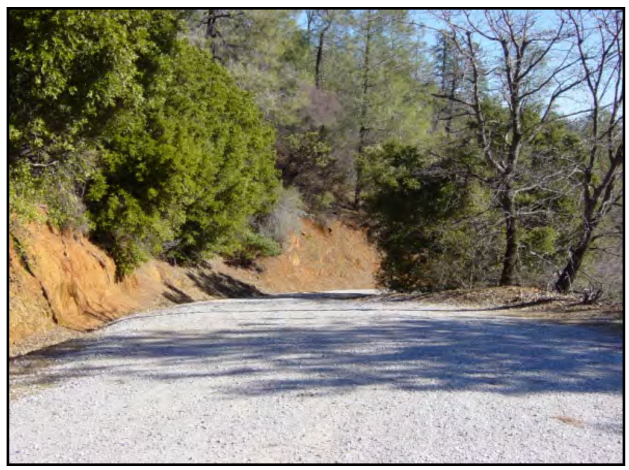
Proposed Solution:
Clear right-of-way along Gilman Road to Hirz Mountain Lookout Road and McCloud Bridge.
16.0 miles long x 50 feet across = 97 acres.

Gilman Road
Note dense vegetation to road edge

#18 – Top of the Hill Road

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Maintain shaded fuelbreak near Top of the Hill Road and Gilman Road.
0.4 miles long x 200 feet across = 10 acres.

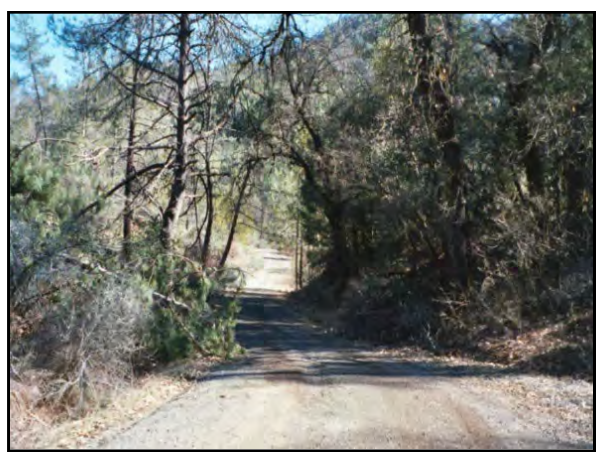


Top of The Hill Road showing brush encroachment

#19 – Statton Road

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Maintain shaded fuelbreaks near Statton Road.
1.4 miles long x 200 feet across = 34 acres.



Statton Road showing narrow road, steep terrain, and brush encroachment.

#20 – Pollard Flat

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Construct shaded fuelbreaks near Pollard Flat.
1.0 miles long x 200 feet across = 24 acres.

Pollard Flat east of the restaurant

#21 – Lakeview Heights

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Construct shaded fuelbreaks near Lakeview Drive.
0.7 miles long x 200 feet across = 17 acres.

#22 – Delta/Volmers

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Construct shaded fuelbreaks near the areas of Delta and Volmers.
1.1 miles long x 200 feet across = 27 acres.

Access road into Delta/Vollmers

#23 – Hirz Mountain Lookout Road

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Construct shaded fuelbreaks near Hirz Mountain Road.
2.5 miles long x 200 feet across = 61 acres.

Hirz Mtn. Lookout Road showing narrow road with steep terrain

#24 – Shasta Marina

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Construct shaded fuelbreaks near Shasta Marina.
0.4 miles long x 200 feet across = 10 acres.

#25 – Gibson Road

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Construct shaded fuelbreaks near Gibson Road.
2.6 miles long x 200 feet across = 63 acres.

Near Gibson Road

#26 – Sugarloaf Subdivision

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Construct shaded fuelbreaks near the Sugarloaf subdivision.
2.1 miles long x 200 feet across = 51 acres.

#27 – Highland Lakes

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Construct shaded fuelbreaks near Highland Lakes.
3.2 miles long x 200 feet across = 78 acres.

#28 – Sugarloaf NE Ridge

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Maintain fuelbreak along the northeast ridge of Sugarloaf Summit.
1.2 miles long x 200 feet across = 29 acres.

#29 – Sugarloaf Lookout Road

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Maintain fuelbreak near Sugarloaf Lookout Road.
0.4 miles long x 200 feet across = 10 acres.

II. COMMUNITY PRIORITIES

A. OVERALL COMMUNITY WILDFIRE RISK ASSESSMENT

LAKEHEAD PLANNING AREA OVERALL COMMUNITY WILDFIRE RISK ASSESSMENT								
Community, structure or area at risk	**Map Number**	**Fuel Hazard**	**Wildfire Occurrence Risk**	**Structural Ignitability**	**Preparedness Capability**	**Overall Risk**	**Fire Hazard Severity Zone Rating**	**WUI**
Lakeshore Drive	1	High	High	High	Low	High	Very High	Yes
Northwoods	2	High	High	High	Low	High	Very High	Yes
Dog Creek	3	High	High	High	Low	High	Very High	Yes
Lakeside Woods Subdivision	4	High	High	High	Low	High	Very High	Yes
Slate Creek	5	High	High	High	Low	High	Very High	Yes
Old Mill Road	6	High	High	High	Low	High	Very High	Yes
Waterman Road	7	High	High	High	Low	High	Very High	Yes
Sims Road	8	High	High	High	Low	High	Very High	Yes
Lakehead-Riverview Drive	9	High	High	High	Low	High	Very High	Yes
Skyline Subdivision	10	High	High	High	Low	High	Very High	Yes
Holiday Harbor	11	High	High	High	Low	High	Very High	Yes
Pakcers Bay	12	High	High	High	Low	High	Very High	Yes
Gregory Creek Drainage	13	High	High	High	Low	High	Very High	Yes
O'Brian Mountain Estates	14	High	High	High	Low	High	Very High	Yes
Lower Salt Creek Road	15	High	High	High	Low	High	Very High	Yes

A. OVERALL COMMUNITY WILDFIRE RISK ASSESSMENT (continued)

LAKEHEAD PLANNING AREA OVERALL COMMUNITY WILDFIRE RISK ASSESSMENT								
Community, structure or area at risk	**Map Number**	**Fuel Hazard**	**Wildfire Occurrence Risk**	**Structural Ignitability**	**Preparedness Capability**	**Overall Risk**	**Fire Hazard Severity Zone Rating**	**WUI**
Snowbird Lane	16	High	High	High	Low	High	Very High	Yes
Gilman Road	17	High	High	High	Low	High	Very High	Yes
Top of the Hill	18	High	High	High	Low	High	Very High	Yes
Statton Road	19	High	High	High	Low	High	Very High	Yes
Pollard Flat	20	High	High	High	Low	High	Very High	Yes
Lakeview Heights	21	High	High	High	Low	High	Very High	Yes
Delta / Volmers	22	High	High	High	Low	High	Very High	Yes
Hirz Mtn. Lookout Road	23	High	High	High	Low	High	Very High	Yes
Shasta Marina	24	High	High	High	Low	High	Very High	Yes
Gibson Road	25	High	High	High	Low	High	Very High	Yes
Sugarloaf Subdivision	26	High	High	High	Low	High	Very High	Yes
Highland Lakes	27	High	High	High	Low	High	Very High	Yes
Sugarloaf NE Ridge	28	High	High	High	Low	High	Very High	Yes
Sugarloaf Lookout Road	29	High	High	High	Low	High	Very High	Yes

B. OVERALL COMMUNITY HAZARD REDUCTION ASSESSMENT

LAKEHEAD PLANNING AREA
OVERALL COMMUNITY HAZARD REDUCTION ASSESSMENT

Community, structure or area at risk	Map Number	Overall Risk	Cultural Value	Treatment Type	Treatment Method
Lakeshore Drive	1	High	High	Fuelbreak	Brush and tree removal, pruning
Northwoods	2	High	High	Fuelbreak	Brush and tree removal, pruning
Dog Creek	3	High	High	Fuelbreak	Brush and tree removal, pruning
Lakeside Woods Subdivision	4	High	High	Fuelbreak	Brush and tree removal, pruning
Slate Creek	5	High	High	Fuelbreak	Brush and tree removal, pruning
Old Mill Road	6	High	High	Fuelbreak	Brush and tree removal, pruning
Waterman Road	7	High	High	Fuelbreak	Brush and tree removal, pruning
Sims Road	8	High	High	Fuelbreak	Brush and tree removal, pruning
Lakehead-Riverview Drive	9	High	High	Fuelbreak	Brush and tree removal, pruning
Skyline Subdivision	10	High	High	Fuelbreak	Brush and tree removal, pruning
Holiday Harbor	11	High	High	Fuelbreak	Brush and tree removal, pruning
Pakcers Bay	12	High	High	Fuelbreak	Brush and tree removal, pruning
Gregory Creek Drainage	13	High	High	Fuelbreak	Brush and tree removal, pruning
O'Brian Mountain Estates	14	High	High	Fuelbreak	Brush and tree removal, pruning
Lower Salt Creek Road	15	High	High	Fuelbreak	Brush and tree removal, pruning

B. OVERALL COMMUNITY HAZARD REDUCTION ASSESSMENT (continued)

LAKEHEAD PLANNING AREA OVERALL COMMUNITY HAZARD REDUCTION ASSESSMENT					
Community, structure or area at risk	**Map Number**	**Overall Risk**	**Cultural Value**	**Treatment Type**	**Treatment Method**
Snowbird Lane	16	High	High	Fuelbreak	Brush and tree removal, pruning
Gilman Road	17	High	High	Fuelbreak	Brush and tree removal, pruning
Top of the Hill	18	High	High	Fuelbreak	Brush and tree removal, pruning
Statton Road	19	High	High	Fuelbreak	Brush and tree removal, pruning
Pollard Flat	20	High	High	Fuelbreak	Brush and tree removal, pruning
Lakeview Heights	21	High	High	Fuelbreak	Brush and tree removal, pruning
Delta / Volmers	22	High	High	Fuelbreak	Brush and tree removal, pruning
Hirz Mtn. Lookout Road	23	High	High	Fuelbreak	Brush and tree removal, pruning
Shasta Marina	24	High	High	Fuelbreak	Brush and tree removal, pruning
Gibson Road	25	High	High	Fuelbreak	Brush and tree removal, pruning
Sugarloaf Subdivision	26	High	High	Fuelbreak	Brush and tree removal, pruning
Highland Lakes	27	High	High	Fuelbreak	Brush and tree removal, pruning
Sugarloaf NE Ridge	28	High	High	Fuelbreak	Brush and tree removal, pruning
Sugarloaf Lookout Road	29	High	High	Fuelbreak	Brush and tree removal, pruning

III. COMMUNITY PRIORITIES

RESIDENCES AND MAJOR STRUCTURES

About 704 homes and 256 vacation/recreation homes make up the communities of Lakeshore, Lakehead, Delta, Pollard Flat, Vollmers, LaMoine, the Gilman Road neighborhood, and surrounding area. Major structures include stores, post office, motels, school, resorts and marinas. The winter population is 1,618 residents, but in summer the population can swell to three times this number of people (personal communication with local business leaders).

Lakehead Volunteer Fire Company

The Lions Club Hall

Canyon Community Church

Canyon Elementary School

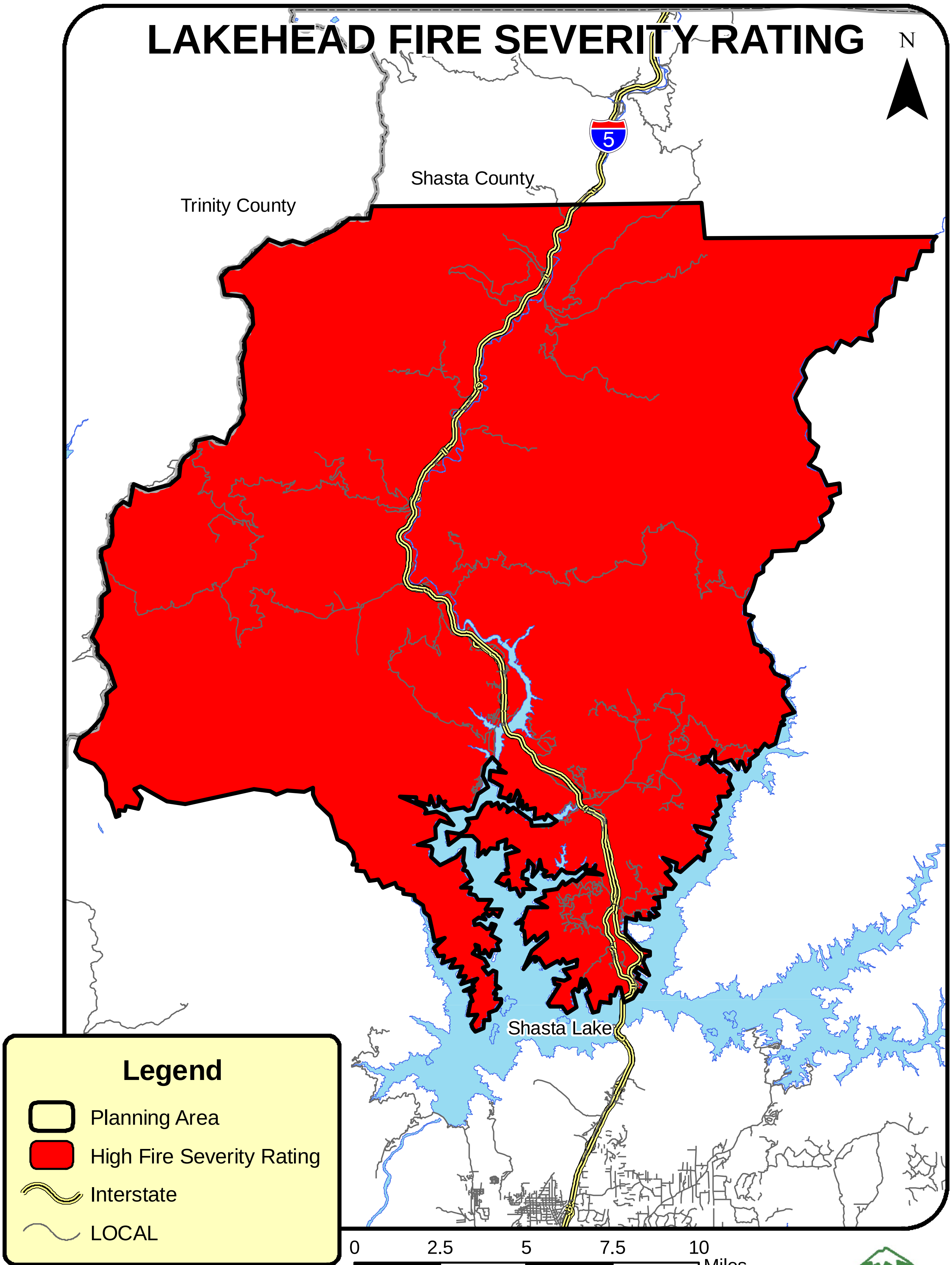
Dog Creek Bridge

MAPS OF LAKEHEAD PLANNING AREA

1. **LAKEHEAD PROPOSED PROJECTS AND PLANNING AREA**
2. **FIRE SEVERITY RATING**
3. **VEGETATION**
4. **SPECIAL STATUS SPECIES AND HABITAT**

Priority	Project Name
1	Lakeshore Drive
2	Northwoods
3	Dog Creek
4	Lakeside Woods Subdivision
5	Slate Creek
6	Old Mill Road
7	Waterman Road
8	Sims Road
9	Lakehead-Riverview Dr
10	Skyline Subdivision
11	Holiday Harbor
12	Packers Bay
13	Gregory Creek Drainage
14	O'Brian Mountain Estates
15	Lower Salt Creek Road
16	Snowbird Lane
17	Gilman Road
18	Top of the Hill
19	Statton Road
20	Pollard Flat
21	Lakeview Heights
22	Delta/Volmers
23	Hirz Mt Lookout Road
24	Shasta Marina
25	Gibson Road
26	Sugarloaf Subdivision
27	Highland Lakes
28	Sugarloaf NE Ridge FB
29	Sugarloaf Lookout Rd FB

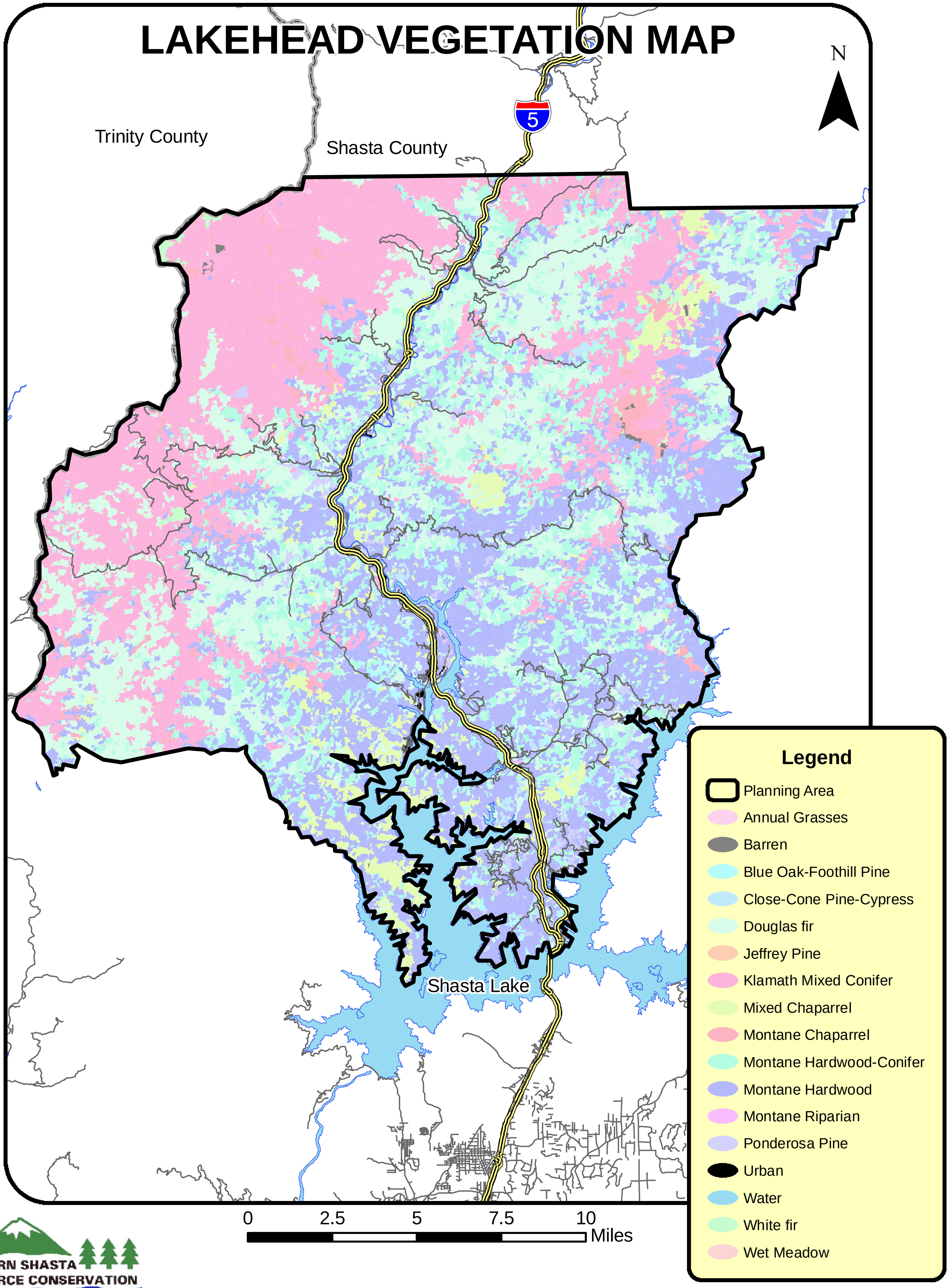
MAP 2



VERY HIGH FIRE HAZARD SEVERITY ZONE
as Recommended by CAL FIRE

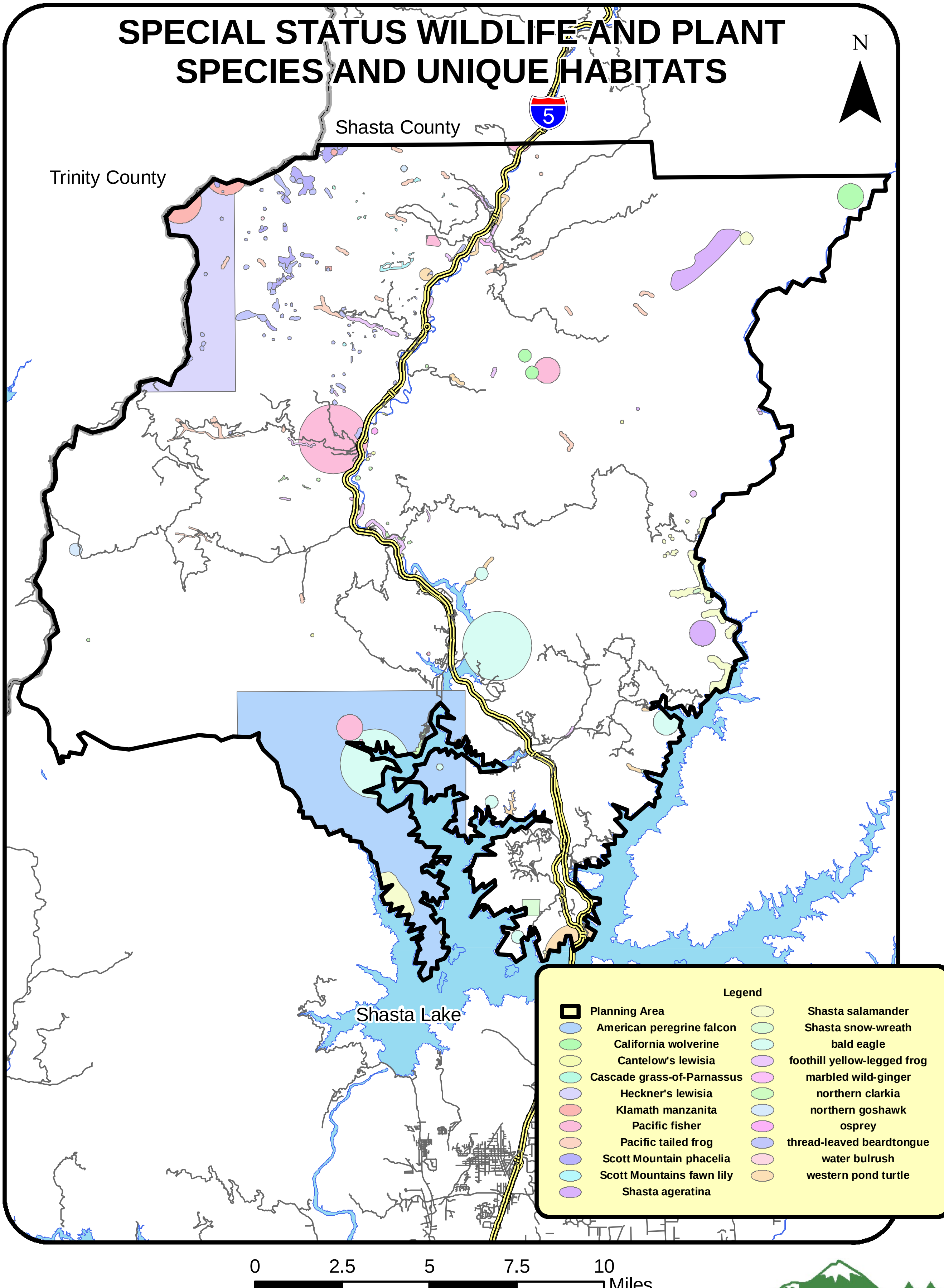
WESTERN SHASTA RESOURCE CONSERVATION DISTRICT

MAP 3



WESTERN SHASTA RESOURCE CONSERVATION DISTRICT

MAP 4



WESTERN SHASTA RESOURCE CONSERVATION DISTRICT

2016
SHASTA COUNTY
COMMUNITY WILDFIRE PROTECTION PLAN

LOWER CLEAR CREEK
PLANNING AREA

Covering the communities of:

- Anderson
- Centerville
- Happy Valley
- Igo
- Redding (south-west)

LOWER CLEAR CREEK PLANNING AREA (2016)

I. PROPOSED PROJECTS

A. THE PLANNING AREA

The 31,256-acre Lower Clear Creek Watershed lies southwest of Redding. The largest concentration of residences is in the southeastern portion of the planning area with scattered residences throughout the rest of the area. With the presence of Whiskeytown National Recreation Area (WNRA), establishment of the Horsetown-Clear Creek Preserve, and the development of a trail system and overlook on BLM land, recreational use of the watershed has increased dramatically.

Mining has occurred in the watershed for over 150 years. Gold and gravel were mined throughout the main stem of Clear Creek resulting in extensive damage to the waterway and associated fish habitat. However, over the past decade, Lower Clear Creek Watershed has had extensive work to successfully restore spawning habitat for salmon and steelhead.

Topography of the area varies from relatively flat in the eastern reaches to very steep in the western reaches. Elevations vary from 450 feet in the Sacramento River valley floor to 6,200 feet on Shasta Bally Mountain on the WNRA. Generally, the climate of the watershed is characterized by warm, dry summers and cool, wet winters. Average temperature and precipitation vary greatly within the watershed due largely to changes in elevation. Climatic data from Redding is representative of the lower portion of the watershed. Average annual precipitation for Redding is 38.7 inches ranging from 14.9 inches to 67.8 inches. Average annual temperature is 63.2 degrees F, but often exceeds 100 degrees F in summer. Snow is not uncommon, but rarely persists in lower elevations. Summer winds are generally from the south while north winds are common in late summer and fall.

B. PRIORITY PROJECTS

LOWER CLEAR CREEK PLANNING AREA FUEL REDUCTION PROJECTS				
PROPOSED PROJECT	**MAP NUMBER**[1]	**TYPE**	**AREA (acres)**	**ESTIMATED COST**[2]
Richards Way (Friendly Hills)	1	Fuelbreak	58	$303,709
Canyon Rd/Valley View Rd	2	Fuelbreak	17	$88,582
Bohn Blvd/Friendly Hills	3	Fuelbreak	34	$177,164
Setting Sun/China Gulch Dr	4	Fuelbreak	75	$392,291
Happy Valley Rd East	5	Fuelbreak	10	$50,618
Canto de las Lupine to San Souci	6	Fuelbreak	78	$404,945
Diggins Way	7	Fuelbreak	27	$139,200
Zogg Mine Road	8	Fuelbreak	109	$569,455
Mule Mountain FB	9	Fuelbreak	107	$556,800
Horsetown to Placer West (Bridge to Bridge)	10	Fuelbreak	100	$520,100
Muletown Road	11	Fuelbreak	82	$215,000
Placer West (Bridge to Centerville)	12	Fuelbreak	70	$366,982
Texas Springs Road	13	Fuelbreak	58	$303,709
Archer Rd FB	14	Fuelbreak	22	$113,891

The identified fuel reduction projects fall into two categories:

1. defensible space for homes and structures, and
2. roadside and ridgeline shaded fuelbreaks intended to create safe ingress and egress for fire personnel and escape routes for residents.

Projects were prioritized based on need and factors such as the following:

- Protection of private residences and properties;
- Access or escape route for the public and fire suppression forces;
- Identification of staging areas in conjunction with the fuelbreak development to provide fire suppression forces strategic locations for planning fire management and suppression actions.
- Connections to other fuelbreaks or areas of lower risk.

Landowners and residents are strongly encouraged to develop defensible space or maintain the fuels reduction projects on their properties to keep the integrity of the work done and to show project sustainability which could lead to additional future projects.

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[1] Proposed projects are numbered on the map according to priority.
[2] Estimated costs of the projects are for planning only. More accurate costs will be determined for the preparation of project proposals.

LOWER CLEAR CREEK PLANNING AREA BASIC ASSUMPTIONS[3]	
Estimated cost of fuelbreak (roadside)	$5,220 per acre
Estimated cost of fuelbreak (ridgetop or off-road)	$7,310 per acre
Estimated cost of defensible space (hand labor)	$600 per dwelling (<1 acre)
Standard fuelbreak width	200 feet
Population	2.6 per dwelling
Dwellings	2257
Property Value (~ $201,250 - $475,000 per dwelling)	$260,000
Schools	$145,000,000
Commercial Structures Value[4]	$415,500 – $23,900,000
Power line	10.26 miles @ $250,000/mile

#1 – Richards Way

- Dense continuous fuels and northerly winds present wildland fire threat to residences located south of Lower Clear Creek; and
- Provides emergency ingress/egress.

Proposed Solution:

Construct shaded fuelbreaks along the south rim of Lower Clear Creek Canyon, behind the properties near Richards Way.
2.4 miles long x 200 feet wide = 58 acres.

Dense fuels along the south rim of Clear Creek Canyon

[3] Estimated costs of the projects are for planning only. More accurate costs will be determined for the preparation of project proposals.
[4] County assessed values, 2010

#2 – Canyon Road/Valley View Road

- Vulnerable to dense fuels and westerly wind-driven wildfires;
- Protects a water tower, Redding Ranchettes subdivision, Redding Rancheria and Win River Casino; and
- Provides emergency ingress/egress.

Proposed Solution:
Construct shaded fuelbreaks near Valley View Road.
0.7 miles long x 200 feet wide = 17 acres.

North end of proposed fuelbreak looking southwest

#3 – Bohn Blvd (Friendly Hills)

- Vulnerable to northerly wind-driven wildfires, dense fuels, and steep terrain;
- Protects residential subdivisions; and
- Provides emergency ingress/egress.

Proposed Solution:
Construct shaded fuelbreaks behind residences near Bohn Blvd.
1.4 miles long x 200 feet wide = 34 acres.

Dense fuels along roadway

#4 – Setting Sun/China Gulch Drive

- Vulnerable to northerly wind-driven wildfires, dense fuels, and steep terrain;
- Protects residential subdivisions; and
- Provides emergency ingress/egress.

Proposed Solution:

Construct shaded fuelbreaks behind residences near Setting Sun Drive.
3.1 miles long x 200 feet wide = 75 acres.

Residences in Friendly Hills.
This is similar to Richards Way, Bohn Blvd, and Setting Sun Drive.

#5 – Happy Valley Road East

- Vulnerable to northerly wind-driven wildfires, dense fuels, and steep terrain;
- Protects residential properties; and
- Provides emergency ingress/egress.

Proposed Solution:

Construct shaded fuelbreaks behind residences near Happy Valley Road.
0.4 miles long x 200 feet wide = 10 acres.

#6 – Canto de Las Lupine to San Souci

- Vulnerable to northerly wind-driven wildfires, dense fuels, and steep terrain;
- Protects the community of Centerville; and
- Provides emergency ingress/egress.

Proposed Solution:

Construct shaded fuelbreaks behind residences between Canto de Las Lupine and San Souci Drive.
3.2 miles long x 200 feet wide = 78 acres.

#7 – Diggins Way

- Vulnerable to northerly wind-driven wildfires, dense fuels, and steep terrain;
- Protects residential subdivisions; and
- Provides emergency ingress/egress.

Proposed Solution:

Construct shaded fuelbreaks behind residences near Diggins Way.
1.1 miles long x 200 feet wide = 27 acres.

#8 – Zogg Mine Road

- Vulnerable to northerly wind-driven wildfires, dense fuels, and steep terrain;
- Protects residential properties; and
- Provides emergency ingress/egress.

Proposed Solution:

Construct shaded fuelbreaks along the right-of-way on Zogg Mine Road.
4.5 miles long x 100 feet wide = 55 acres.

#9 – Mule Mountain

- Vulnerable to northerly wind-driven wildfires, dense fuels, and steep terrain;
- Protects residential properties; and
- Provides emergency ingress/egress.

Proposed Solution:

Maintain fuelbreak along the north-south ridge of Mule Mtn.
4.4 miles long x 200 feet wide = 107 acres.

#10 – Horsetown to Placer West (Bridge to Bridge)

- Continuity of hazardous fuel plus dead fuel buildup in the southeastern corner of Horsetown-Clear Creek Preserve.
- Several years ago, a heavy snow storm blanketed Shasta County. Thousands of trees were toppled over or limbs were broken off. Numerous trees were affected in the southeastern corner of the Horsetown Clear Creek Preserve. After that, in 2013, the Clover Fire burned part of this area. Removal of the dead fuel and construction of a fuelbreak along the property boundary will help to prevent a fire from spreading.

Proposed Solution:

Construct shaded fuelbreaks near Horestown-Clear Creek Preserve and north near Cloverdale Road then east along Placer Road to the Clear Creek Veterans Memorial Bridge.

4.1 miles long x 200 feet wide = 100 acres.

Dense continuous fuels along southern boundary of Horsetown-Clear Creek Preserve property

#11 – Muletown Road

- Vulnerable to northerly wind-driven wildfires, dense fuels, and steep terrain;
- Protects residential properties; and
- Provides emergency ingress/egress.

Proposed Solution:
Construct shaded fuelbreak along Muletown Road.
3.4 miles long x 100 feet wide = 41 acres.

#12 – Placer Road West (Bridge to Centerville)

- Vulnerable to northerly wind-driven wildfires, dense fuels, and steep terrain;
- Protects residential properties; and
- Provides emergency ingress/egress.

Proposed Solution:
Construct shaded fuelbreaks near western Placer Road.
2.9 miles long x 200 feet wide = 70 acres.

#13 – Texas Springs Road

- Vulnerable to southerly wind-driven wildfires, dense fuels, and steep terrain;
- Protects residential properties; and
- Provides emergency ingress/egress.

Proposed Solution:
Construct shaded fuelbreaks near Texas Springs Road.
2.4 miles long x 200 feet wide = 58 acres.

II. COMMUNITY PRIORITIES

A. OVERALL COMMUNITY WILDFIRE RISK ASSESSMENT

LOWER CLEAR CREEK PLANNING AREA OVERALL COMMUNITY WILDFIRE RISK ASSESSMENT								
Community, structure or area at risk	**Map Number**	**Fuel Hazard**	**Wildfire Occurrence Risk**	**Structural Ignitability**	**Preparedness Capability**	**Overall Risk**	**Fire Hazard Severity Zone Rating**	**WUI**
Richards Way	1	High	High	High	Low	High	Very High	Yes
Canyon Rd/Valley View Rd	2	High	High	High	Low	High	Very High	Yes
Bohn Blvd	3	High	High	High	Low	High	Very High	Yes
Setting Sun Drive	4	High	High	High	Low	High	Very High	Yes
Happy Valley Rd East	5	High	High	High	Low	High	Very High	Yes
Canto de Las Lupine to San Souci	6	High	High	High	Low	High	Very High	Yes
Diggins Way	7	High	High	High	Low	High	Very High	Yes
Zogg Mine Road	8	High	High	High	Low	High	Very High	Yes
Mule Mountain	9	High	High	High	Low	High	Very High	Yes
Horsetown to Placer West	10	High	High	High	Low	High	Very High	Yes
Muletown Road	11	High	High	High	Low	High	Very High	Yes
Placer West	12	High	High	High	Low	High	Very High	Yes
Texas Springs Road	13	High	High	High	Low	High	Very High	Yes
Archer Road	14	High	High	High	Low	High	Very High	Yes

B. OVERALL COMMUNITY HAZARD REDUCTION ASSESSMENT

LOWER CLEAR CREEK PLANNING AREA
OVERALL COMMUNITY HAZARD REDUCTION ASSESSMENT

Community, structure or area at risk	Map Number	Overall Risk	Cultural Value	Treatment Type	Treatment Method
Richards Way	1	High	Low	Fuelbreak	Brush and tree removal, pruning
Canyon Rd/Valley View Rd	2	High	Low	Fuelbreak	Brush and tree removal, pruning
Bohn Blvd	3	High	Low	Fuelbreak	Brush and tree removal, pruning
Setting Sun Dr	4	High	Low	Fuelbreak	Brush and tree removal, pruning
Happy Valley Rd East	5	High	Low	Fuelbreak	Brush and tree removal, pruning
Canto de Las Lupine to San Souci	6	High	Low	Fuelbreak	Brush and tree removal, pruning
Diggins Way	7	High	Low	Fuelbreak	Brush and tree removal, pruning
Zogg Mine Road	8	High	Low	Right-Of-Way	Brush and tree removal, pruning
Mule Mountain	9	High	Low	Fuelbreak	Brush and tree removal, pruning
Horsetown to Placer West	10	High	Low	Fuelbreak	Brush and tree removal, pruning
Muletown Road	11	High	Low	Fuelbreak	Brush and tree removal, pruning
Placer West	12	High	Low	Fuelbreak	Brush and tree removal, pruning
Texas Springs Road	13	High	Low	Fuelbreak	Brush and tree removal, pruning
Archer Road	14	High	Low	Fuelbreak	Brush and tree removal, pruning

III. COMMUNITY VALUES

RESIDENCES AND MAJOR STRUCTURES

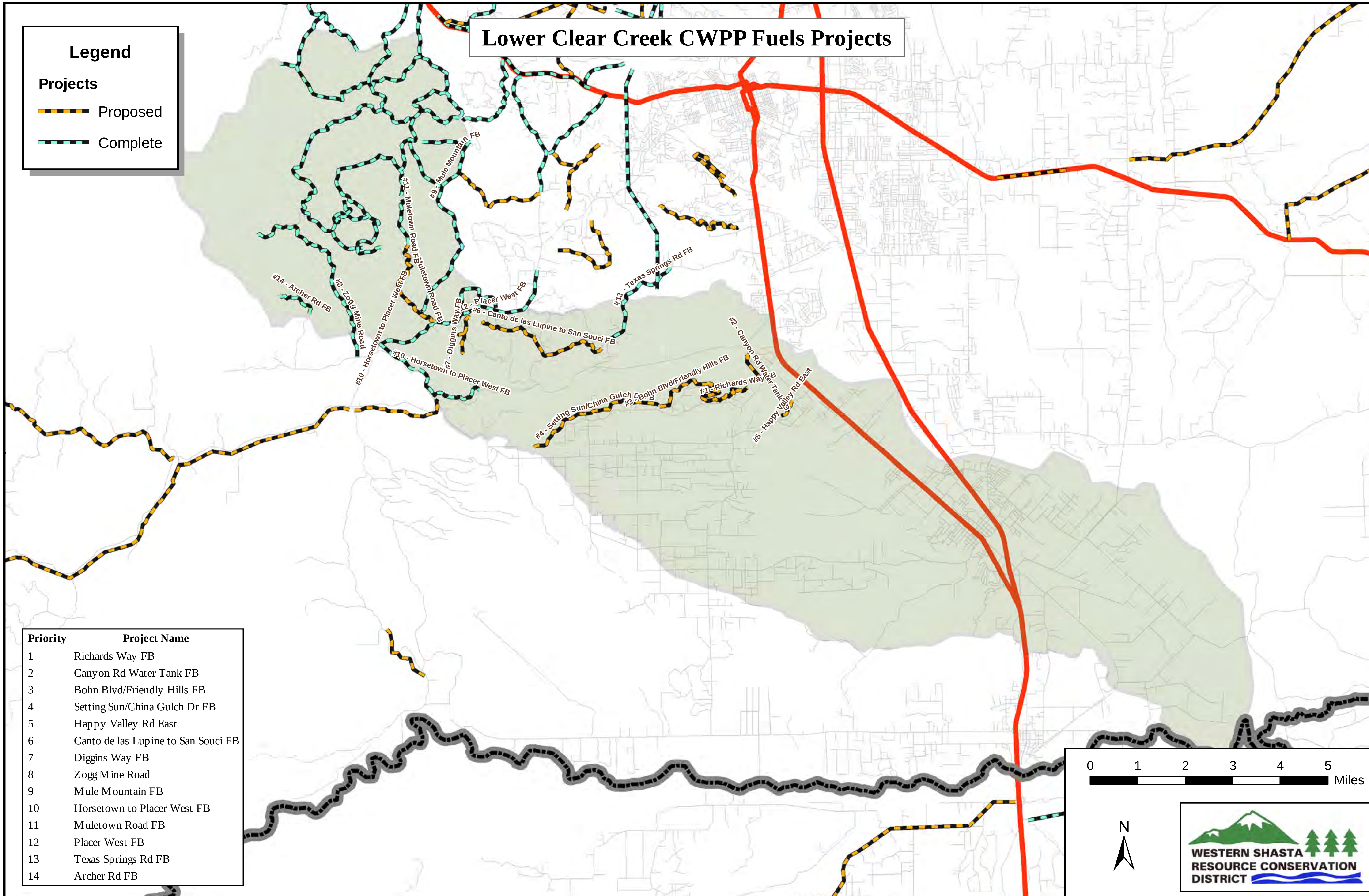
Industry is concentrated in the lower reaches of the LCC watershed and is primarily associated with gravel mining. The majority of the residences are located in the southern portion of the watershed along Canyon Road and China Gulch Drive in the Friendly Hills area.

The Lower Clear Creek watershed does encompass the lands around Redding Rancheria, Horsetown-Clear Creek Preserve, and Whiskeytown Lake and National Recreation Area

Whiskeytown Lake and National Recreation Area

MAPS OF LOWER CLEAR CREEK PLANNING AREA

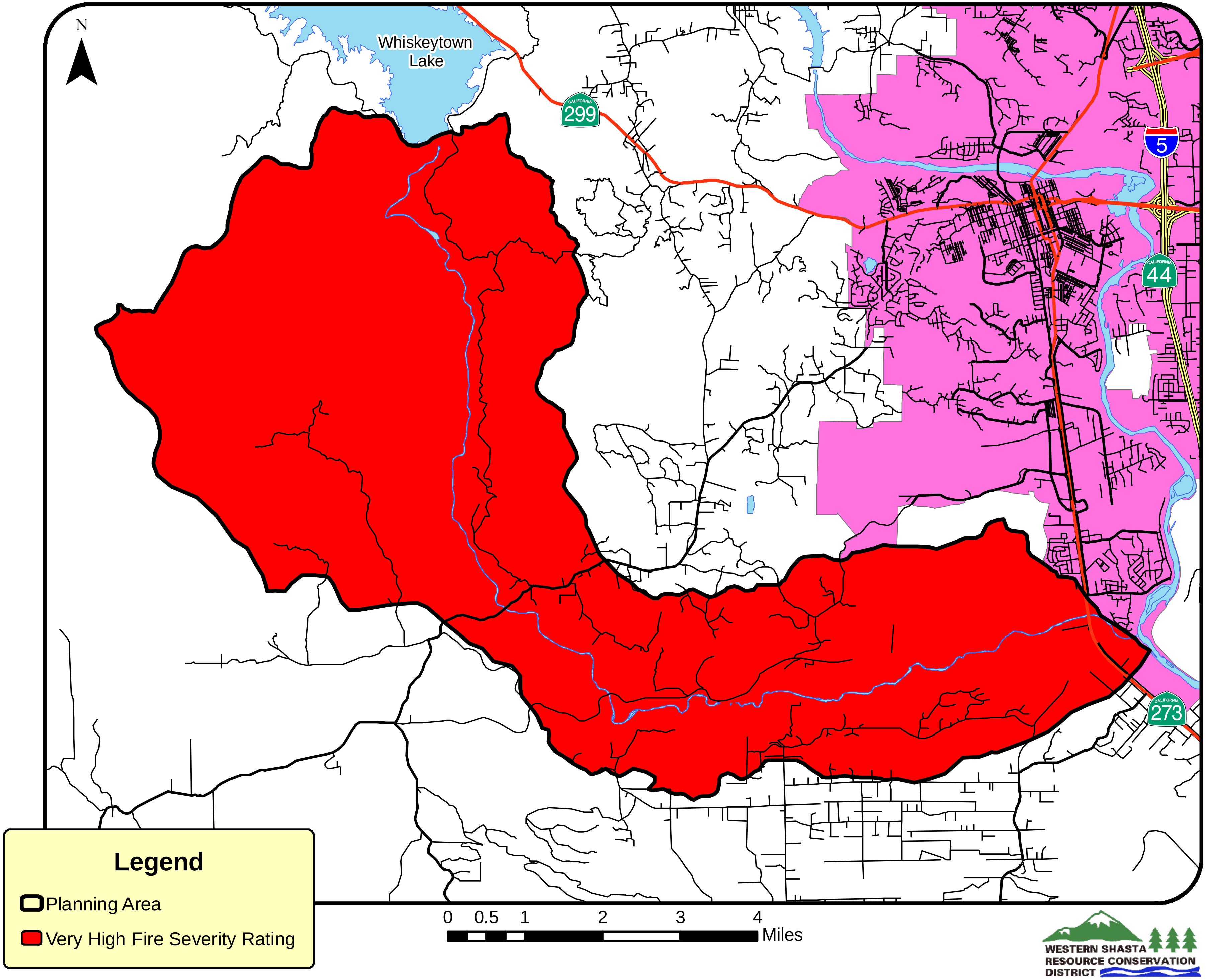
1. **LOWER CLEAR CREEK PROPOSED PROJECTS AND PLANNING AREA**
2. **FIRE SEVERITY RATING**
3. **VEGETATION**
4. **SPECIAL STATUS SPECIES AND HABITAT**



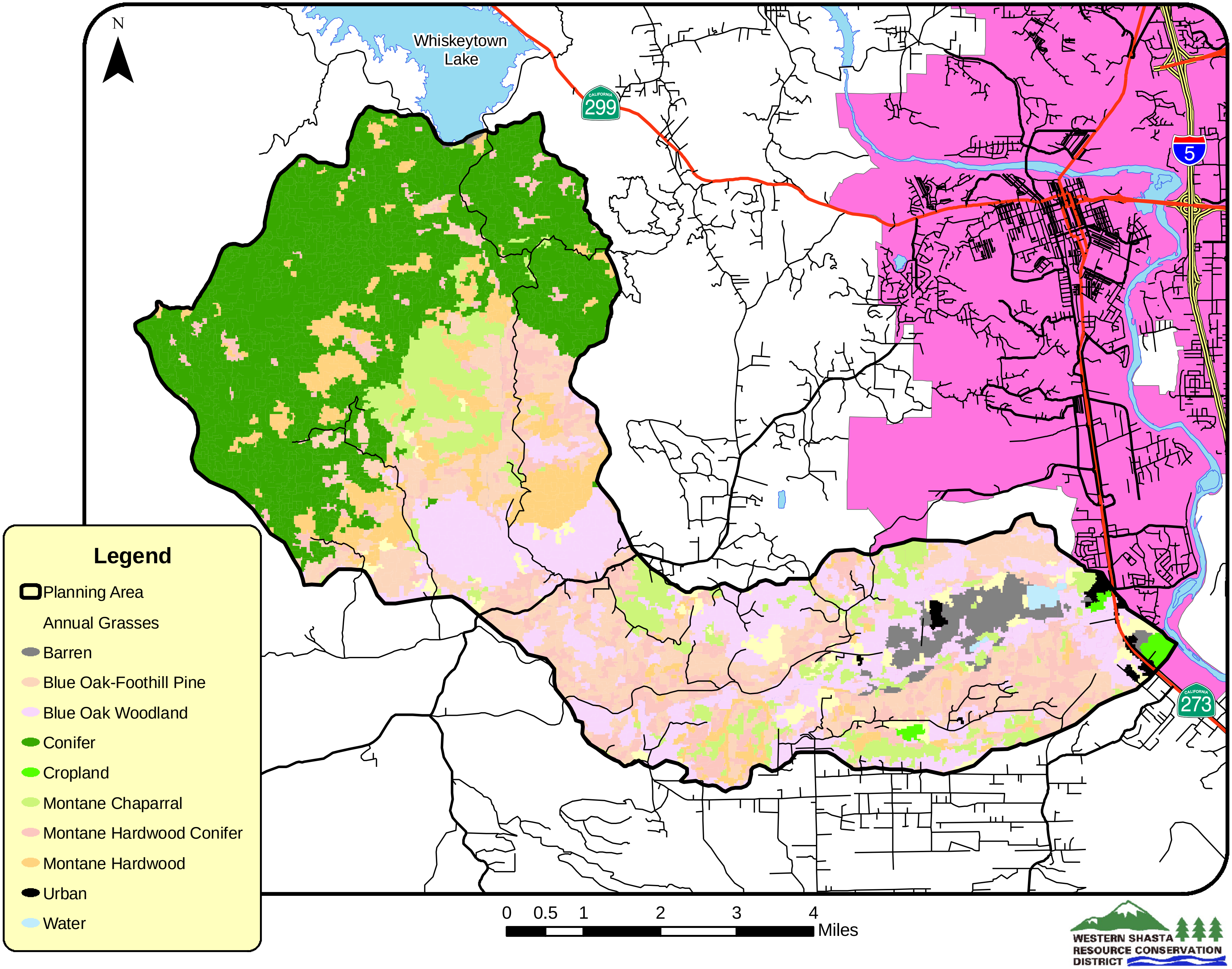
Priority	Project Name
1	Richards Way FB
2	Canyon Rd Water Tank FB
3	Bohn Blvd/Friendly Hills FB
4	Setting Sun/China Gulch Dr FB
5	Happy Valley Rd East
6	Canto de las Lupine to San Souci FB
7	Diggins Way FB
8	Zogg Mine Road
9	Mule Mountain FB
10	Horsetown to Placer West FB
11	Muletown Road FB
12	Placer West FB
13	Texas Springs Rd FB
14	Archer Rd FB

MAP 2

FIRE SEVERITY RATING

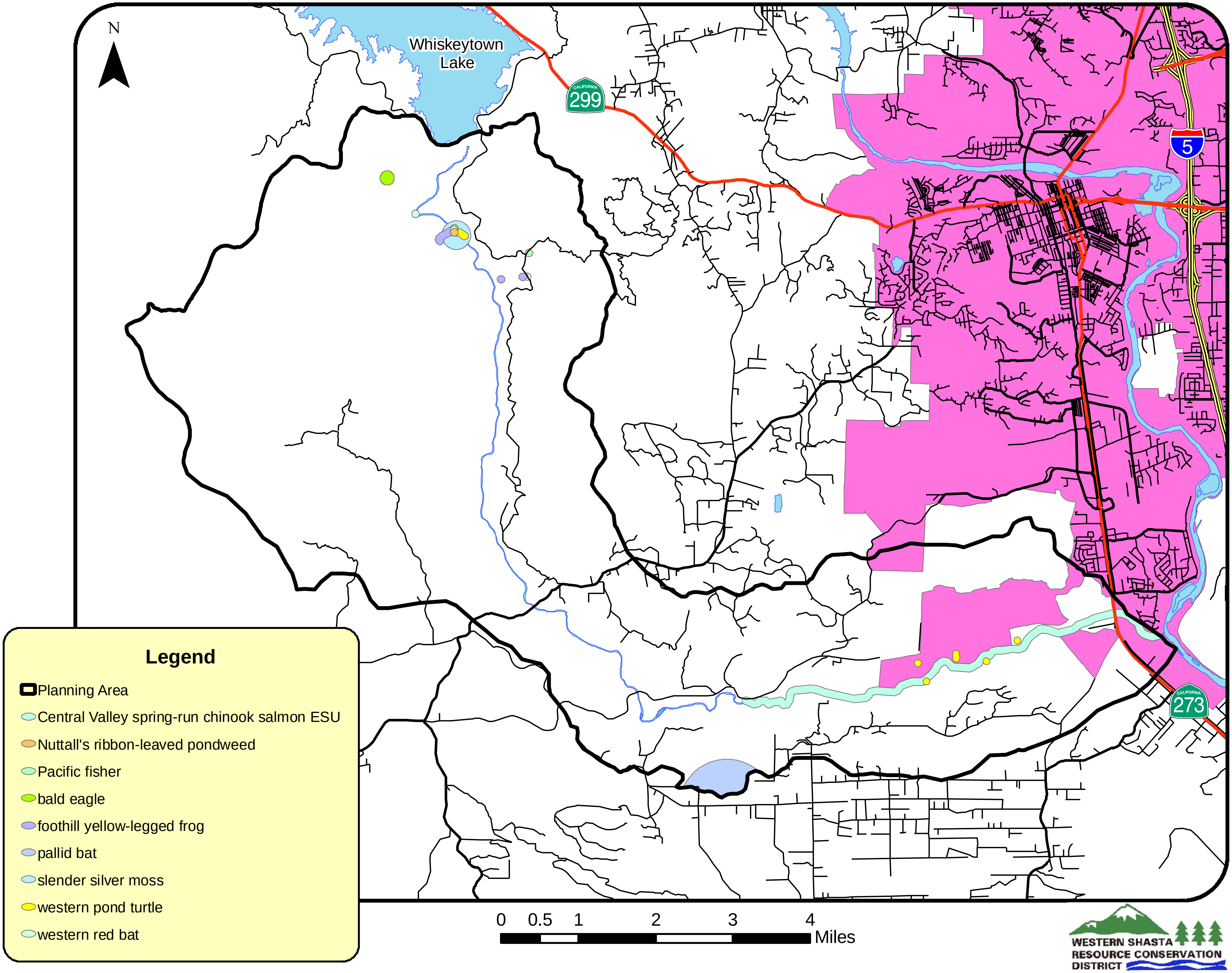


VEGETATION


N
Whiskeytown Lake
CALIFORNIA 299
5
CALIFORNIA 273
Legend
Planning Area
Annual Grasses
Barren
Blue Oak-Foothill Pine
Blue Oak Woodland
Conifer
Cropland
Montane Chaparral
Montane Hardwood Conifer
Montane Hardwood
Urban
Water
0 0.5 1 2 3 4
Miles
WESTERN SHASTA RESOURCE CONSERVATION DISTRICT

MAP 4

SPECIAL STATUS WILDLIFE AND PLANT SPECIES



2016
SHASTA COUNTY
COMMUNITY WILDFIRE PROTECTION PLAN

OLD STATION / HAT CREEK VALLEY PLANNING AREA

Covering the communities of:

- Hat Creek
- Old Station
- Cassel

OLD STATION / HAT CREEK VALLEY PLANNING AREA (2016)

I. PROPOSED PROJECTS

A. THE WATERSHED AND PLANNING AREA

The Hat Creek Valley covers an area about 30 miles long and 18 miles wide, equaling a total area of about 183 square miles or 117,338 acres. The Hat Creek Valley is located 50 miles east of Redding, California and 235 miles north of San Francisco, and is part of the Pit River Basin, making it an important watershed of the Sacramento River and Shasta Lake. The area has remained relatively undeveloped over time and is a high quality water supply source for Lake Britton and later the Central Valley Project, which supplies water throughout California. Area communities include Old Station, Hat Creek, Cassel, McArthur-Burney Falls State Park, and surrounding developed areas.

Vegetation in the area is characterized by seven vegetation types: Douglas-fir- Mixed Conifer Forest, Mixed Conifer, Ponderosa Pine, Canyon Live Oak Woodland, Black Oak Woodland, Gray Pine Woodland, and Chaparral. Vegetation outside the developed agriculture areas is mainly trees and brush. It includes ponderosa pine, sugar pine, California black oak, incense-cedar, Douglas-fir, and white fir, with a mixed understory of ceanothus and manzanita. Vegetative elements include wild herbaceous plants, shrubs, desert shrubs, riparian shrubs and trees, and coniferous trees. Deep side canyons typically support significant stands of aspen, cottonwood, and other riparian vegetation.

Elevation ranges for these vegetation types are between 3,182 feet on the valley floor at Rock Spring near Cassel and 4,500 feet at Old Station, to the peak of 7,863 at Burney Mountain. Mean annual precipitation is 20 to 40 inches, some of which is snow. The mean annual air temperature is estimated to be 57 to 65 degrees Fahrenheit. Climatic data is quoted from *The Soil Survey of Lassen National Forest Area, California.*

HCV-FSC Demonstration Project

The Hat Creek Valley Fire Safe Council (HCV-FSC) is conducting three fuel reduction demonstrations where two sites were treated mechanically and one by hand. The demonstration project, although small in scope, requires environmental permits under the scope of the California Environmental Quality Act (CEQA). Specifically, compliance with the Endangered Species Act (ESA/Migratory Bird Treaty Act (MBTA) and the National Historic Preservation Act (NHPA) were required. This element was contracted out to a professional archeologist and biologist that performed field surveys and delivered a final report. There were no significant findings in Cassel or Hat Creek, although there were historical references identified in Old Station. The Final Report is available through the Hat Creek Valley Fire Safe Council. An encroachment permit from the California Department of Transportation was also secured for the site in Hat Creek. The permit requires a six inch road base, approximately 20’ X 30’, in the entryway off State Highway 89.

Cassel Demonstration Site

Hat Creek Demonstration Site

Old Station Demonstration Site

B. PROJECT PRIORITIES

OLD STATION/HAT CREEK VALLEY PLANNING AREA FUEL REDUCTION PROJECTS				
PROPOSED PROJECT	**MAP NUMBER**[1]	**TYPE**	**AREA (acres)**	**ESTIMATED COST**[2]
Old Station/Rim Rock/Hat Creek Village Subdivision	1	Fuelbreak	53	$278,400
Hat Creek Highlands	2	Fuelbreak	27	$139,200
Big Spring Estates	3	Fuelbreak	36	$189,818
Wild Bird Lane	4	Fuelbreak	17	$88,582
HWY-89 near Honn Creek Ln	5	Fuelbreak	24	$126,545
Crane Road	6	Fuelbreak	27	$139,000
Cassel Community West	7	Fuelbreak	20	$105,000

Projects were prioritized based on need and factors such as the following:

- Protection of private residences and properties;
- Access or escape route for the public and fire suppression forces;
- Identification of staging areas in conjunction with the fuelbreak development to provide fire suppression forces strategic locations for planning fire management and suppression actions.
- Connections to other fuelbreaks or areas of lower risk.

Landowners and residents are strongly encouraged to develop defensible space or maintain the fuels reduction projects on their properties to keep the integrity of the work done and to show project sustainability which could lead to additional future projects.

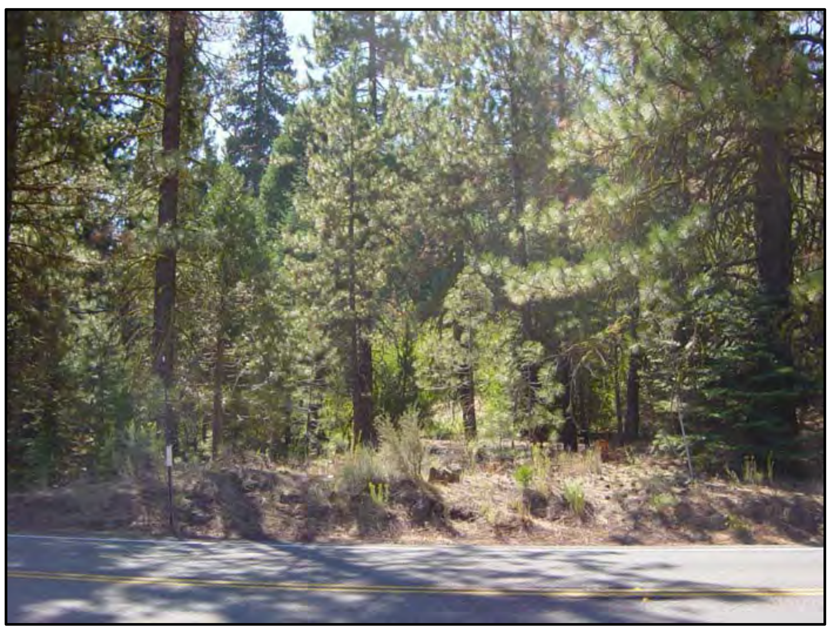
[1] Proposed projects are numbered on the map according to priority.
[2] Estimated costs of the projects are for planning only. More accurate costs will be determined for the preparation of project proposals.

OLD STATION/HAT CREEK VALLEY PLANNING AREA BASIC ASSUMPTIONS[3]	
Estimated cost of fuelbreak (roadside)	$5,220 per acre
Estimated cost of fuelbreak (ridgetop or off-road)	$7,310 per acre
Estimated cost of defensible space (hand labor)	$600 per dwelling (<1 acre)
Standard fuelbreak width	200 feet
Population	2.6 per dwelling
Property Value (~ $201,250 - $475,000 per dwelling)	$260,000
Schools	$145,000,000
Commercial Structures Value[4]	$415,500 – $23,900,000

#1 – Old Station/Rim Rock/Hat Creek Village Subdivision

- Provides protection to residences and ingress/egress for emergency crews and residents.

Proposed Solution:
Construct shaded fuelbreak around the community of Old Station near HWY-89.
2.2 miles long x 200 feet across = 53 acres.



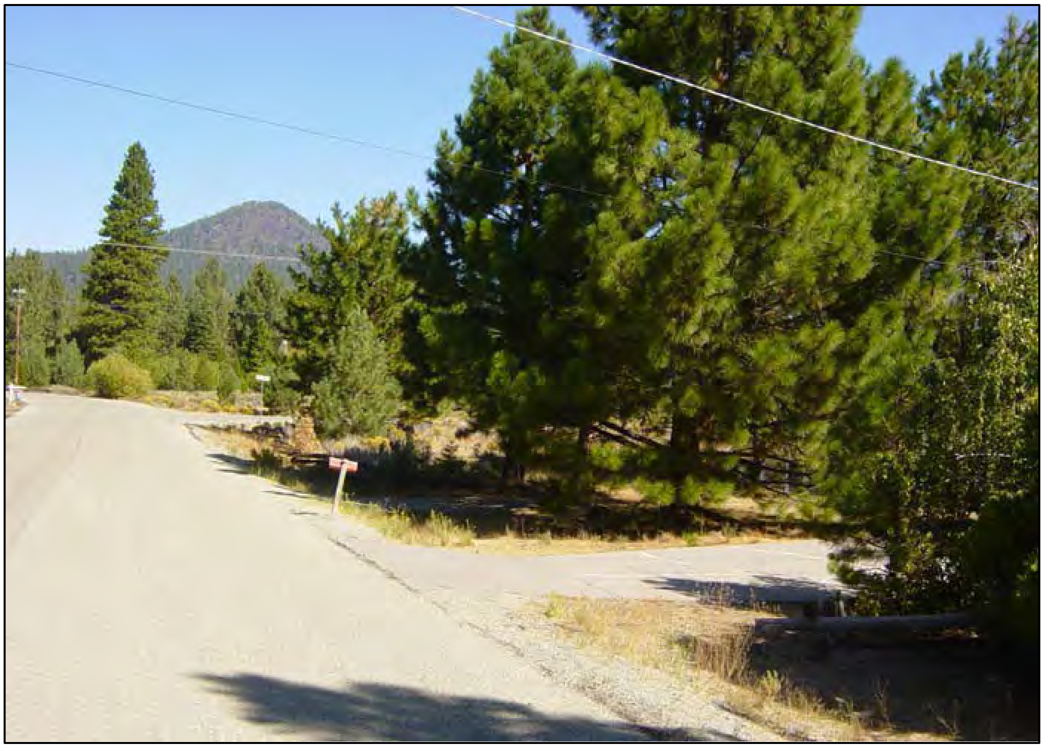
Old Station/Rim Rock/Hat Creek Village Subdivision.
Note the dense vegetation up to the roadside.

[3] Estimated costs of the projects are for planning only. More accurate costs will be determined for the preparation of project proposals.
[4] County assessed values, 2010

#2 – Hat Creek Highlands

- Provides ingress and egress for emergency crews and residents.

Proposed Solution:
Construct shaded fuelbreaks around the community near Sugar Loaf Lane.
1.1 miles long x 200 feet across = 27 acres.



Hat Creek Highlands along Sugar Loaf Lane.
Note the dense vegetation along the roadside.

#3 – Big Springs Estates

- Provides ingress and egress for emergency crews and residents.

Proposed Solution:
Maintain fuelbreak around the rural Big Spring Estates with under-burning.
1.5 miles long x 200 feet across = 36 acres.

Big Pine Campground. Note the dense vegetation along the roadside.

Near Big Spring Estates. Note the dense vegetation along the roadside.

#4 – Wildbird Lane

- Provides ingress and egress for emergency crews and residents.

Proposed Solution:
Construct shaded fuelbreaks around the community near Sugar Loaf Lane.
0.7 miles long x 200 feet across = 17 acres.

Wild Bird Lane. Note the dense vegetation up to the roadside.

#5 – HWY-89 near Honn Creek Lane

- Provides ingress and egress for emergency crews and residents.

Proposed Solution:
Construct shaded fuelbreaks around the community near Sugar Loaf Lane.
1.0 miles long x 200 feet across = 24 acres.

HWY-89 near Honn Creek Lane. Note the dense vegetation up to the roadside.

Near Honn Creek Lane. Note the dense vegetation up to the roadside.

#6 – Crane Road

- Provides protection to residences and ingress/egress for emergency crews and residents.

Proposed Solution:
Maintain fuelbreak west of Crane Road.
1.1 miles long x 200 feet across = 27 acres.

#7 – Cassel Community West

- Provides protection to residences and ingress/egress for emergency crews and residents.

Proposed Solution:
Maintain fuelbreak west of town of Cassel.
0.8 miles long x 200 feet across = 20 acres.

II. COMMUNITY PRIORITIES

A. OVERALL COMMUNITY WILDFIRE RISK ASSESSMENT

OLD STATION/HAT CREEK VALLEY PLANNING AREA OVERALL COMMUNITY WILDFIRE RISK ASSESSMENT								
Community, structure or area at risk	**Map Number**	**Fuel Hazard**	**Wildfire Occurrence Risk**	**Structural Ignitability**	**Preparedness Capability**	**Overall Risk**	**Fire Hazard Severity Zone Rating**	**WUI**
Old Station/Rim Rock/Hat Creek Village Subdivision	1	High	High	High	Medium	High	Very High	Yes
Hat Creek Highlands	2	High	High	High	Low	High	Very High	Yes
Big Spring Estates	3	High	High	High	Low	High	Very High	Yes
Wild Bird Lane	4	High	High	High	Low	High	Very High	Yes
HWY-89 near Honn Creek Ln	5	High	High	High	Medium	High	Very High	Yes
Crane Road	6	High	High	High	Medium	High	Very High	Yes
Cassel Community West	7	High	High	High	Medium	High	Very High	Yes

B. OVERALL COMMUNITY HAZARD REDUCTION ASSESSMENT

OLD STATION/HAT CREEK VALLEY PLANNING AREA OVERALL COMMUNITY HAZARD REDUCTION ASSESSMENT					
Community, structure or area at risk	**Map Number**	**Overall Risk**	**Cultural Value**	**Treatment Type**	**Treatment Method**
Old Station/Rim Rock/Hat Creek Village Subdivision	1	High	High	Fuelbreak	Brush and tree removal, pruning
Hat Creek Highlands	2	High	High	Fuelbreak	Brush and tree removal, pruning
Big Spring Estates	3	High	High	Fuelbreak	Brush and tree removal, pruning
Wild Bird Lane	4	High	High	Fuelbreak	Brush and tree removal, pruning
HWY-89 near Honn Creek Ln	5	High	High	Fuelbreak	Brush and tree removal, pruning
Crane Road	6	High	High	Fuelbreak	Brush and tree removal, pruning
Cassel Community West	7	High	High	Fuelbreak	Brush and tree removal, pruning

III. <u>COMMUNITY VALUES</u>

RESIDENCES AND MAJOR STRUCTURES

About 773 homes make up the communities of Old Station, Hat Creek, and Cassel, and the surrounding area. Major structures include stores, post offices, restaurants, schools, and resorts. The year-round population is 849 residents. In summer, the population swells due to recreational tourism.

Old Station volunteer firehouse

Hat Creek Store, Old Station

JJ's Café, Old Station

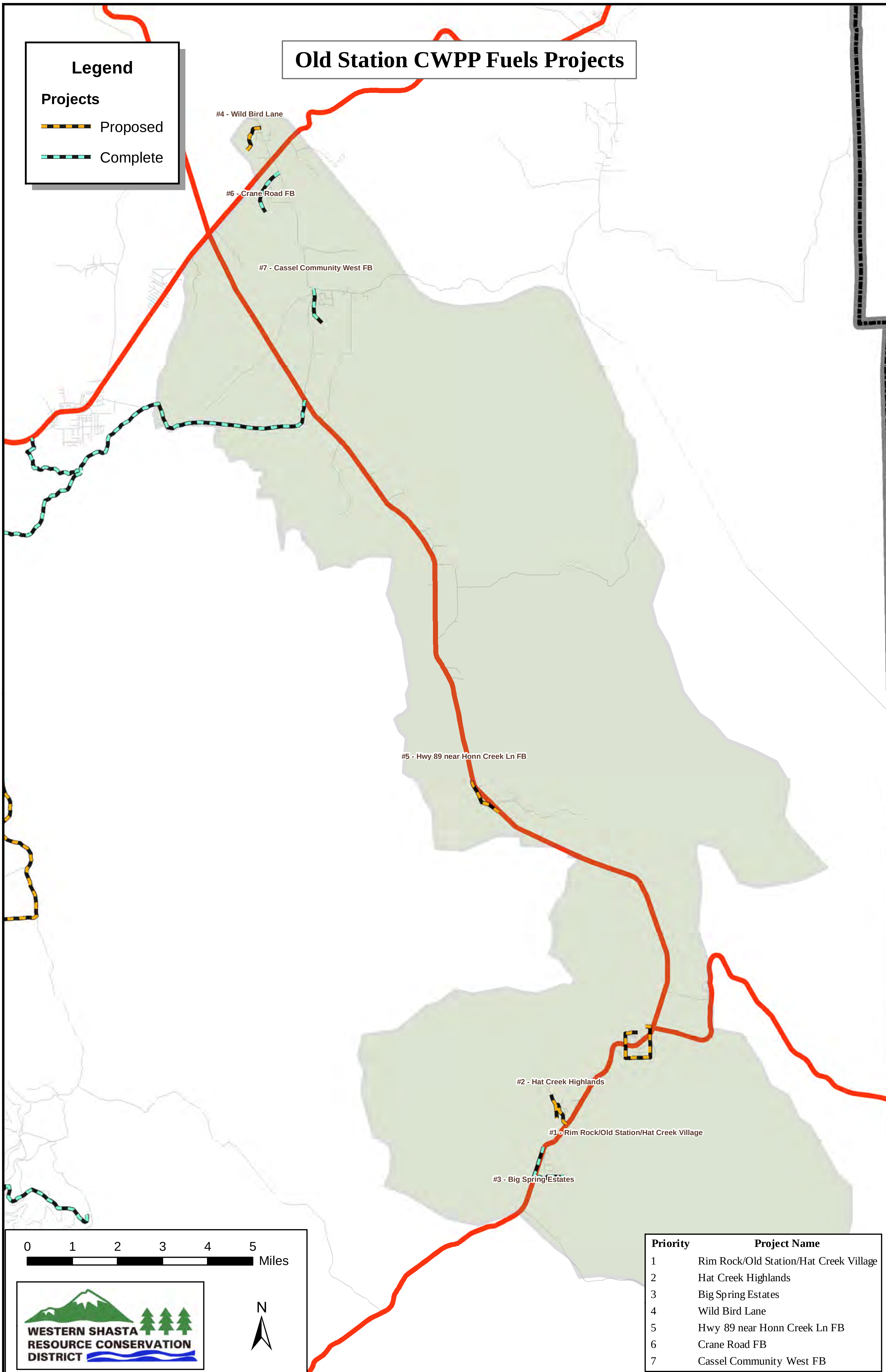
Hat Creek volunteer firehouse

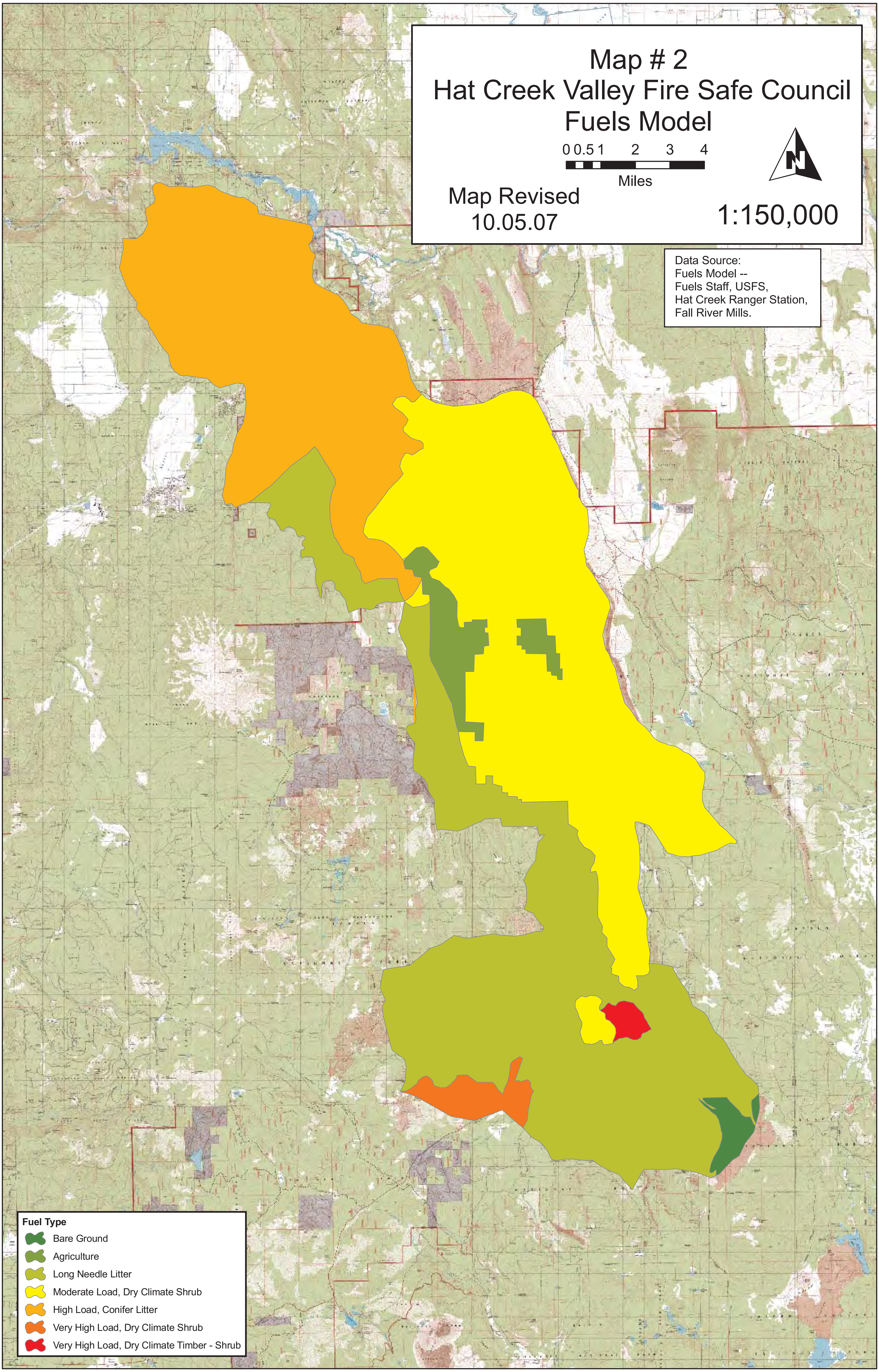
Cassel volunteer firehouse

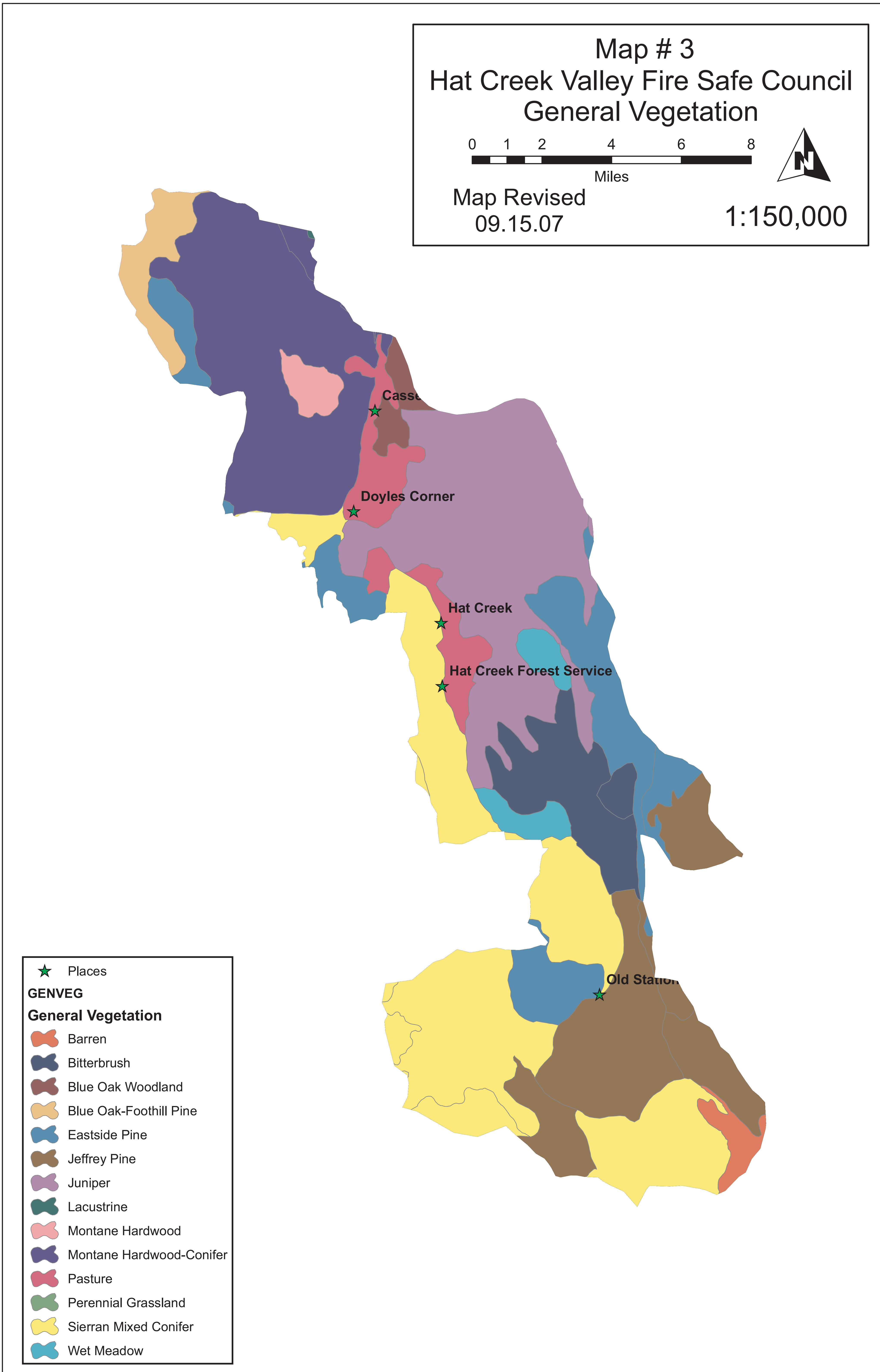
MAPS OF OLD STATION / HAT CREEK VALLEY PLANNING AREA

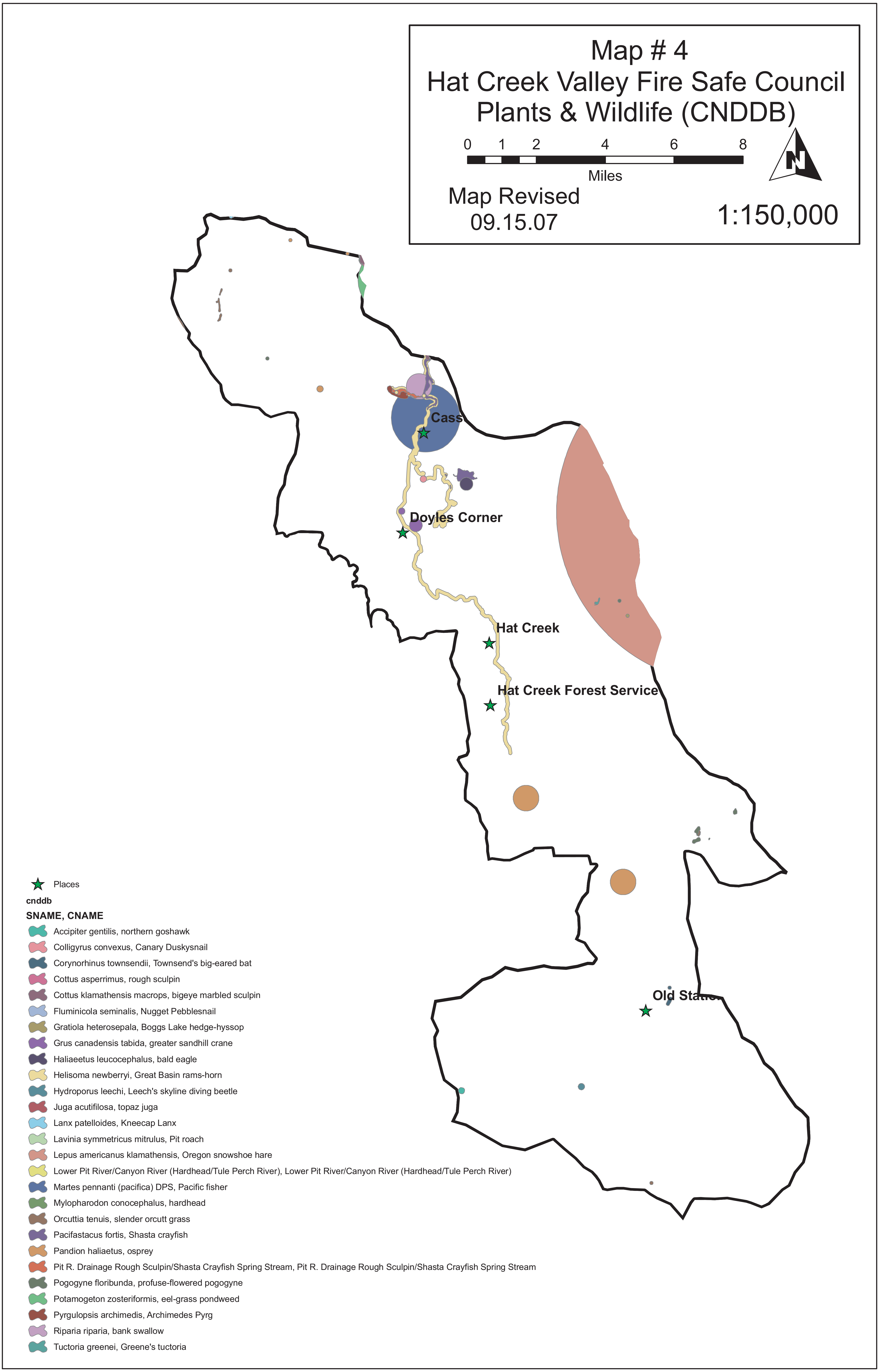
1. OLD STATION / HAT CREEK VALLEY PROPOSED PROJECTS AND PLANNING AREA
2. FIRE SEVERITY RATING
3. VEGETATION
4. SPECIAL STATUS SPECIES AND HABITAT

Map #1


Old Station CWPP Fuels Projects
Legend
Projects
Proposed
Complete
#4 - Wild Bird Lane
#6 - Crane Road FB
#7 - Cassel Community West FB
#5 - Hwy 89 near Honn Creek Ln FB
#2 - Hat Creek Highlands
#1 - Rim Rock/Old Station/Hat Creek Village
#3 - Big Spring Estates
0 1 2 3 4 5
Miles
N
WESTERN SHASTA RESOURCE CONSERVATION DISTRICT
Priority Project Name
1 Rim Rock/Old Station/Hat Creek Village
2 Hat Creek Highlands
3 Big Spring Estates
4 Wild Bird Lane
5 Hwy 89 near Honn Creek Ln FB
6 Crane Road FB
7 Cassel Community West FB


Map # 2
Hat Creek Valley Fire Safe Council
Fuels Model
0 0.5 1 2 3 4
Miles
Map Revised
10.05.07
1:150,000
N
Data Source:
Fuels Model --
Fuels Staff, USFS,
Hat Creek Ranger Station,
Fall River Mills.
Fuel Type
Bare Ground
Agriculture
Long Needle Litter
Moderate Load, Dry Climate Shrub
High Load, Conifer Litter
Very High Load, Dry Climate Shrub
Very High Load, Dry Climate Timber - Shrub


Map # 3
Hat Creek Valley Fire Safe Council
General Vegetation
0 1 2 4 6 8
Miles
Map Revised
09.15.07
1:150,000
N
Casse
Doyles Corner
Hat Creek
Hat Creek Forest Service
Old Statio
Places
GENVEG
General Vegetation
Barren
Bitterbrush
Blue Oak Woodland
Blue Oak-Foothill Pine
Eastside Pine
Jeffrey Pine
Juniper
Lacustrine
Montane Hardwood
Montane Hardwood-Conifer
Pasture
Perennial Grassland
Sierran Mixed Conifer
Wet Meadow



Map # 4
Hat Creek Valley Fire Safe Council
Plants & Wildlife (CNDDB)
0 1 2 4 6 8
Miles
Map Revised
09.15.07
1:150,000
Cass
Doyles Corner
Hat Creek
Hat Creek Forest Service
Old Station
Places
cnddb
SNAME, CNAME
Accipiter gentilis, northern goshawk
Colligyrus convexus, Canary Duskysnail
Corynorhinus townsendii, Townsend's big-eared bat
Cottus asperrimus, rough sculpin
Cottus klamathensis macrops, bigeye marbled sculpin
Fluminicola seminalis, Nugget Pebblesnail
Gratiola heterosepala, Boggs Lake hedge-hyssop
Grus canadensis tabida, greater sandhill crane
Haliaeetus leucocephalus, bald eagle
Helisoma newberryi, Great Basin rams-horn
Hydroporus leechi, Leech's skyline diving beetle
Juga acutifilosa, topaz juga
Lanx patelloides, Kneecap Lanx
Lavinia symmetricus mitrulus, Pit roach
Lepus americanus klamathensis, Oregon snowshoe hare
Lower Pit River/Canyon River (Hardhead/Tule Perch River), Lower Pit River/Canyon River (Hardhead/Tule Perch River)
Martes pennanti (pacifica) DPS, Pacific fisher
Mylopharodon conocephalus, hardhead
Orcuttia tenuis, slender orcutt grass
Pacifastacus fortis, Shasta crayfish
Pandion haliaetus, osprey
Pit R. Drainage Rough Sculpin/Shasta Crayfish Spring Stream, Pit R. Drainage Rough Sculpin/Shasta Crayfish Spring Stream
Pogogyne floribunda, profuse-flowered pogogyne
Potamogeton zosteriformis, eel-grass pondweed
Pyrgulopsis archimedis, Archimedes Pyrg
Riparia riparia, bank swallow
Tuctoria greenei, Greene's tuctoria

2016
SHASTA COUNTY
COMMUNITY WILDFIRE PROTECTION PLAN

SHASTA WEST
PLANNING AREA

Covering the communities of:

- Centerville
- Redding (west & downtown)
- Shasta

SHASTA WEST PLANNING AREA
(2016)

I. PROPOSED PROJECTS

A. THE PLANNING AREA

The 47 square miles or about 30,400 acres Shasta West Watershed is the area west of the Sacramento River and Redding and includes the drainages of Rock Creek, Middle Creek, Salt Creek, Jenny Creek, Downtown Redding, Canyon Creek, Oregon Gulch, and Olney Creek which all flow directly into the Sacramento River. Elevation ranges from 430 feet at the Sacramento River to 2,325 feet at the top of Mule Mountain along the northwestern edge of the watershed. The Shasta West watershed is the most highly populated area in Shasta County. The communities of Old Shasta, Centerville, and downtown Redding are within the watershed with the highest density located in urban Redding. However, during the late 1990's and early 2000's, population grew rapidly in the rural portions of the planning area. Land ownership is primarily private, with the exception of the extreme western edge, which is managed by the National Park Service as part of the Whiskeytown National Recreation Area. Scattered sections throughout the watershed are managed by the Bureau of Land Management (BLM).

The watershed has a typical Mediterranean climate with long hot days from late spring to mid-fall with intermittent rain and snow during the cooler season. Below 2,000 feet elevation snow seldom remains longer than a few days. Annual average precipitation as measured by the Bureau of Reclamation (BOR) at Shasta Dam for the period of 1983 through 1993 is 51.2 inches. Summer daytime humidity readings can reach lows of 15 percent or lower. The watershed experiences extreme fire weather conditions, especially from May until September when the high temperature range is between 95-115 degrees F. Frequent strong zonal north winds occur throughout the summer; dry lightning storms occur most years; and dry foehn (down-slope) winds are common in the late summer and throughout the fall.

B. PROPOSED PROJECTS

Locations of the proposed fuel breaks are a combination of neighborhood protection and compartmentalizing the fuels in the watershed. New fuel breaks should be constructed following the priorities set below, as funding becomes available.

SHASTA WEST PLANNING AREA FUEL REDUCTION PROJECTS				
PROPOSED PROJECT	**MAP NUMBER[1]**	**TYPE**	**AREA (acres)**	**ESTIMATED COST[2]**
Iron Mountain Road South	1	Fuelbreak	24	$126,545
Buenaventura Blvd (west)	2	Fuelbreak	25	$132,873
Kenyon Drive/Oregon Gulch	3	Fuelbreak	56	$291,055
Lower Springs Road	4	Fuelbreak	22	$113,891
Swasey Drive	5	Fuelbreak	34	$177,164
Middle Creek Ridge	6	Fuelbreak	27	$139,200
HWY 299 Corridor	7	Fuelbreak	90	$468,218
Sugarloaf Ridge	8	Fuelbreak	41	$215,127
Lower Springs Road to Sugarloaf	9	Fuelbreak	15	$75,927
Rock Creek Ridge	10	Fuelbreak	32	$164,509
Old Shasta to Iron Mtn Rd Powerline	11	Fuelbreak	68	$354,327
Swasey Recreation Area	12	Fuelbreak	53	$278,400
Rock Creek Road	13	Fuelbreak	56	$291,055
Upper Muletown Road	14	Fuelbreak	56	$291,055
Olney Park/Simmons Road	15	Fuelbreak	58	$303,709
Secluded Valley	16	Fuelbreak	36	$189,818
Benson Road	17	Fuelbreak	27	$139,200

The identified fuel reduction projects fall into two categories:

1. defensible space for homes and structures, and
2. roadside and ridgeline shaded fuelbreaks intended to create safe ingress and egress for fire personnel and escape routes for residents.

Projects were prioritized based on need and factors such as the following:

- Protection of private residences and properties;
- Access or escape route for the public and fire suppression forces;

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[1] Proposed projects are numbered on the map according to priority.
[2] Estimated costs of the projects are for planning only. More accurate costs will be determined for the preparation of project proposals.

- Identification of staging areas in conjunction with the fuelbreak development to provide fire suppression forces strategic locations for planning fire management and suppression actions.
- Connections to other fuelbreaks or areas of lower risk.

Landowners and residents are strongly encouraged to develop defensible space or maintain the fuels reduction projects on their properties to keep the integrity of the work done and to show project sustainability which could lead to additional future projects.

SHASTA WEST PLANNING AREA BASIC ASSUMPTIONS[3]	
Estimated cost of fuelbreak (roadside)	$5,220 per acre
Estimated cost of fuelbreak (ridgetop or off-road)	$7,310 per acre
Estimated cost of defensible space (hand labor)	$600 per dwelling (<1 acre)
Standard fuelbreak width	200 feet
Population	2.6 per dwelling
Dwellings	8355
Property Value (~ $201,250 - $475,000 per dwelling)	$260,000
Schools	$145,000,000
Commercial Structures Value[4]	$415,500 – $23,900,000
Power line (39 miles @ $250,000/mile)	$19,437,200

[3] Estimated costs of the projects are for planning only. More accurate costs will be determined for the preparation of project proposals.
[4] County assessed values, 2010

#1 – Iron Mountain Road South

- Vulnerable to northerly wind-driven wildfires, dense fuels, and steep terrain;
- Protects residential properties, sawmill, church, and rock quarry; and
- Provides emergency ingress/egress.

Proposed Solution:

Construct shaded fuelbreaks along the right-of-way on Iron Mountain Road between HWY-299W and Keswick Dam Road
2.0 miles x 100 feet or right-of-way = 24 acres

Iron Mountain Road looking south

#2 – Buenaventura Boulevard (west)

- Protects residential properties, general offices, medical centers, and commercial properties; and
- Provides emergency ingress/egress.

Proposed Solution:

Construct shaded fuelbreaks to the right-of-way along Buenaventura Blvd between Placer Road and HWY-273.
2.1 miles x 100 feet or right-of-way = 25 acres

Buenaventura Boulevard looking south

#3 – Kenyon Drive/Oregon Gulch

- Protects 7 community subdivisions, and several businesses;
- Connects Kenyon Drive to the Powerline fuelbreak; and
- Provides emergency ingress/egress.

Proposed Solution:

Construct shaded fuelbreak along north side of Kenyon Road westward toward Power Line Road.
2.3 miles x 200 feet = 56 acres

Kenyon Drive looking west

#4 – Lower Springs Road

- Connects Swasey Drive to Eureka Way/CA-299 a major transportation route;
- Provides access for emergency crews and escape for residents; and
- Benefits both the city of Shasta and community west of Mary Lake subdivision.

Proposed Solution:

Construct shaded fuelbreaks to the right-of-way along Lower Springs Road, from Swasey Drive to Eureka Way/CA-299.
1.8 miles x 100 feet or right-of-way = 22 acres

#5 – Swasey Drive

- Provides emergency ingress/egress; and
- Benefits both the city of Shasta and community west of Mary Lake subdivision.

Proposed Solution:

Construct shaded fuelbreaks to the right-of-way along Lower Springs Road.
2.8 miles x 100 feet or right-of-way = 34 acres

#6 – Middle Creek Road

- Provides emergency ingress/egress; and
- Protects residential properties south of Keswick and north of HWY-299W.

Proposed Solution:

Construct shaded fuelbreaks near Middle Creek Road.
1.1 miles x 200 feet = 27 acres

#7 – HWY-299W Corridor

- Provides emergency ingress/egress; and
- Benefits communities of Old Shasta and Redding.

Proposed Solution:

Construct shaded fuelbreaks near HWY-299W.
3.7 miles x 200 feet = 90 acres

#8 – Sugarloaf Ridge

- Protects multiple residential communities;
- Protects a communications tower (KNNN-FM); and
- Provides emergency ingress/egress.

Proposed Solution:

Construct an east-west fuelbreak in the Sugarloaf area from Swasey Drive to Skywalker Lane.
1.7 miles x 200 feet = 41 acres; 0.75 miles x 200 feet = 18 acres if the Lower Springs Drive to Sugarloaf fuelbreak is completed prior

Looking west towards Sugar Loaf

#9 – Lower Springs Road to Sugarloaf

- Protects multiple residential communities;
- Protects a communications tower (KNNN-FM); and
- Connects to hiking trails (Westside Trails) for access.

Proposed Solution:

Construct an east-west fuelbreak along the ridges from Lower Springs Road to Skywalker Lane.
0.6 miles x 200 feet = 15 acres

East-West fuelbreak looking west from Skywalker Lane

#10 –Rock Creek Ridge

- Provides access for emergency crews and escape for residents; and
- Was formerly called "Southern Boundary Fuelbreak"

Proposed Solution:

Construct fuelbreak along the ridge between Rock Creek and Spring Creek.
1.3 miles x 200 feet = 32 acres

Rock Creek Ridge in the background

#11 – Old Shasta to Iron Mountain Rd Powerline

Proposed Solution:
Widen existing fuelbreak along the powerline between the community of Shasta and Iron Mountain Road.
2.8 miles x 200 feet = 68 acres


Powerline fuelbreak looking east and west (left-right)

#12 – Swasey Recreation Area

Proposed Solution:
Construct BLM Tributary fuelbreaks in the Swasey Recreation Area.
2.2 miles x 200 feet = 53 acres

#13 – Rock Creek Road

- Allows access for emergency crews and escape for residents
- This project will connect the communities of Shasta and Keswick.

Proposed Solution:
Construct shaded fuelbreaks near Rock Creek Road .
2.3 miles x 200 feet = 56 acres

#14 – Upper Muletown Road

Proposed Solution:
Construct fuelbreaks near Upper Muletown Road.
2.3 miles x 200 feet = 56 acres

#15 – Olney Park/Simmons Road

Proposed Solution:
Construct fuelbreaks near Olney Park Drive and Simmons Road.
2.4 miles x 200 feet = 58 acres

Simmons Road

Trail Drive

#16 – Secluded Valley Drive

Proposed Solution:
Construct fuelbreaks near Secluded Valley Drive.
1.5 miles x 200 feet = 36 acres

#17 – Benson Road

Proposed Solution:
Construct fuelbreaks near Benson Road..
1.1 miles x 200 feet = 27 acres

II. COMMUNITY PRIORITIES

A. OVERALL COMMUNITY WILDFIRE RISK ASSESSMENT

SHASTA WST PLANNING AREA OVERALL COMMUNITY WILDFIRE RISK ASSESSMENT								
Community, structure or area at risk	**Map Number**	**Fuel Hazard**	**Wildfire Occurrence Risk**	**Structural Ignitability**	**Preparedness Capability**	**Overall Risk**	**Fire Hazard Severity Zone Rating**	**WUI**
Iron Mountain Road South	1	High	High	High	Low	High	Very High	Yes
Buenaventura Blvd (west)	2	High	High	High	Low	High	Very High	Yes
Kenyon Drive/Oregon Gulch	3	High	High	High	Low	High	Very High	Yes
Lower Spring Road	4	High	High	High	Low	High	Very High	Yes
Swasey Drive	5	High	High	High	Low	High	Very High	Yes
Middle Creek Ridge	6	High	High	High	Low	High	Very High	Yes
HWY-299 Corridor	7	High	High	High	Low	High	Very High	Yes
Sugarloaf Ridge	8	High	High	High	Low	High	Very High	Yes
Lower Spring Road to Sugarloaf	9	High	High	High	Low	High	Very High	Yes
Rock Creek Ridge	10	High	High	High	Low	High	Very High	Yes
Old Shasta to Iron Mountain Rd Powerline	11	High	High	High	Low	High	Very High	Yes
Swasey Recreation Area	12	High	High	High	Low	High	Very High	Yes
Rock Creek Road	13	High	High	High	Low	High	Very High	Yes
Upper Muletown Road	14	High	High	High	Low	High	Very High	Yes
Olney Park / Simmons Road	15	High	High	High	Low	High	Very High	Yes
Secluded Valley	16	High	High	High	Low	High	Very High	Yes
Benson Road	17	High	High	High	Low	High	Very High	Yes

B. OVERALL COMMUNITY HAZARD REDUCTION ASSESSMENT

SHASTA WEST PLANNING AREA OVERALL COMMUNITY HAZARD REDUCTION ASSESSMENT					
Community, structure or area at risk	**Map Number**	**Overall Risk**	**Cultural Value**	**Treatment Type**	**Treatment Method**
Iron Mountain Road South	1	High	High	Fuelbreak	Brush and tree removal, pruning
Buenaventura Blvd (west)	2	High	High	Fuelbreak	Brush and tree removal, pruning
Kenyon Drive/Oregon Gulch	3	High	High	Fuelbreak	Brush and tree removal, pruning
Lower Spring Road	4	High	High	Right-Of-Way	Brush and tree removal, pruning
Swasey Drive	5	High	High	Fuelbreak	Brush and tree removal, pruning
Middle Creek Ridge	6	High	High	Fuelbreak	Brush and tree removal, pruning
HWY-299 Corridor	7	High	High	Fuelbreak	Brush and tree removal, pruning
Sugarloaf Ridge	8	High	High	Fuelbreak	Brush and tree removal, pruning
Lower Spring Road to Sugarloaf	9	High	High	Fuelbreak	Brush and tree removal, pruning
Rock Creek Ridge	10	High	High	Fuelbreak	Brush and tree removal, pruning
Old Shasta to Iron Mountain Rd Powerline	11	High	High	Fuelbreak	Brush and tree removal, pruning
Swasey Recreation Area	12	High	High	Fuelbreak	Brush and tree removal, pruning
Rock Creek Road	13	High	High	Fuelbreak	Brush and tree removal, pruning
Upper Muletown Road	14	High	High	Fuelbreak	Brush and tree removal, pruning
Olney Park / Simmons Road	15	High	High	Fuelbreak	Brush and tree removal, pruning
Secluded Valley	16	High	High	Fuelbreak	Brush and tree removal, pruning
Benson Road	17	High	High	Fuelbreak	Brush and tree removal, pruning

III. COMMUNITY VALUES

RESIDENCES

According to the 2000 Census, residential land use makes up 55% (16,163 acres) of the watershed. The two rural population centers are the community of Centerville and the historic town of Shasta. The area was rapidly developing in the early to mid 2000's, resulting in a rapid increase in population. The assets at risk from fire consist primarily of the many homes that are located throughout the area. The residences are primarily houses located on large lots, ranchette-style homes with small acreage, and ranches with houses and outbuildings located on the property.

HISTORIC AREA

The 19-acre Shasta State Historic Park is located in the historic town of Shasta. The park includes historic trails and roads, cottage ruins, gardens, orchards and a Catholic Cemetery, where many of Shasta's prominent citizens are buried. Historic structures include the Courthouse Museum and Art Gallery, Jail, and Pioneer Barn.

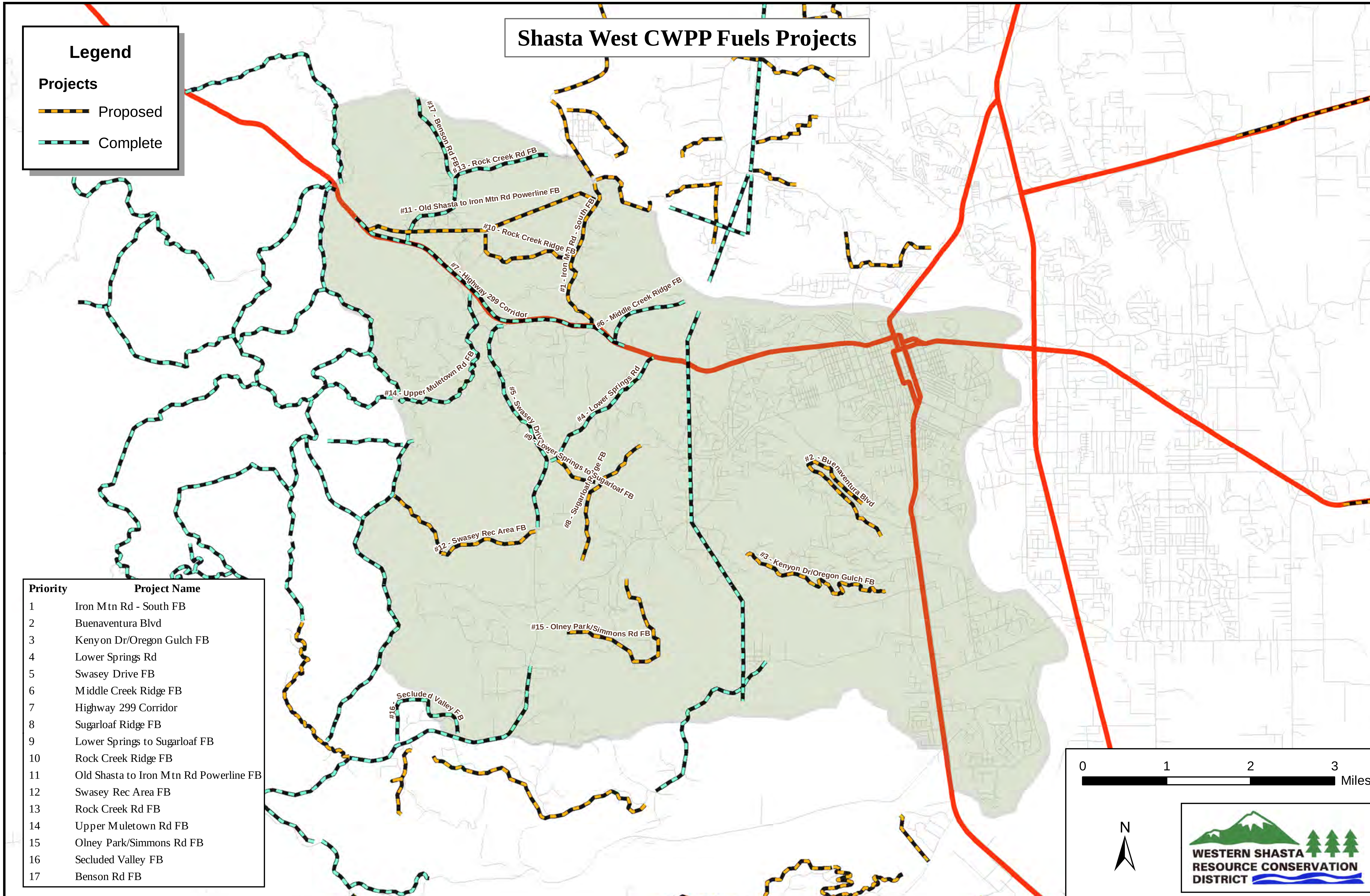
The restored museum building served as the Shasta County Courthouse for three decades in the late 1800s. Today, the building houses the visitor center and information desk, and a collection of historic California artwork. The courtroom, jail, and gallows have been restored and furnished with many original items to interpret Shasta County justice in the days of the gold rush. The Pioneer Barn area houses farming and mining implements of the 1800s, an original stagecoach, and other agricultural supplies.

In the town of Old Shasta, the old business district dates back to the 1850s

MAPS OF SHASTA WEST PLANNING AREA

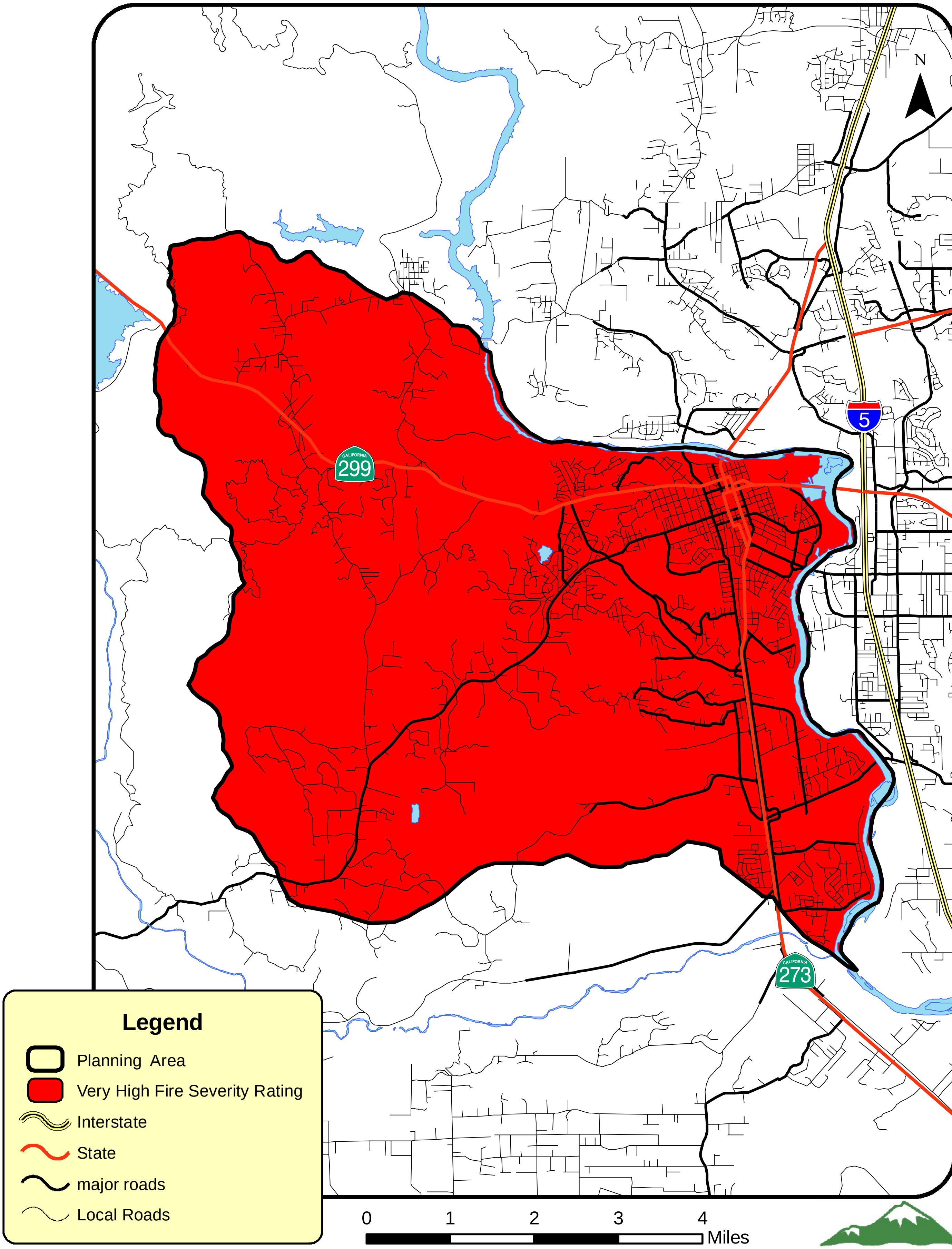
1. **SHASTA WEST PROPOSED PROJECTS AND PLANNING AREA**
2. **FIRE SEVERITY RATING**
3. **VEGETATION**
4. **SPECIAL STATUS SPECIES AND HABITAT**

MAP 1



Priority	Project Name
1	Iron Mtn Rd - South FB
2	Buenaventura Blvd
3	Kenyon Dr/Oregon Gulch FB
4	Lower Springs Rd
5	Swasey Drive FB
6	Middle Creek Ridge FB
7	Highway 299 Corridor
8	Sugarloaf Ridge FB
9	Lower Springs to Sugarloaf FB
10	Rock Creek Ridge FB
11	Old Shasta to Iron Mtn Rd Powerline FB
12	Swasey Rec Area FB
13	Rock Creek Rd FB
14	Upper Muletown Rd FB
15	Olney Park/Simmons Rd FB
16	Secluded Valley FB
17	Benson Rd FB

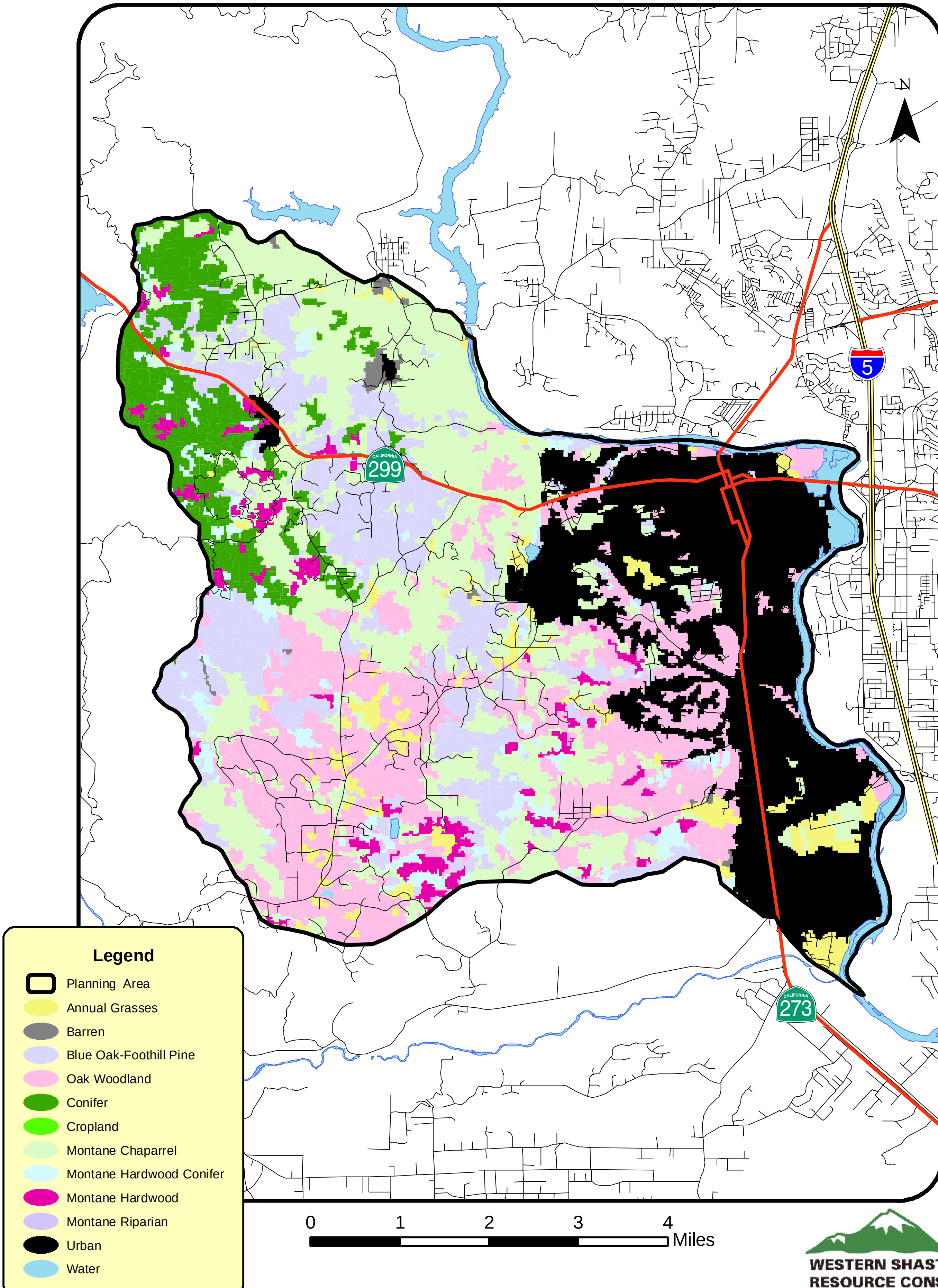
FIRE SEVERITY



VERY HIGH FIRE HAZARD SEVERITY ZONE
as Recommend by CAL FIRE

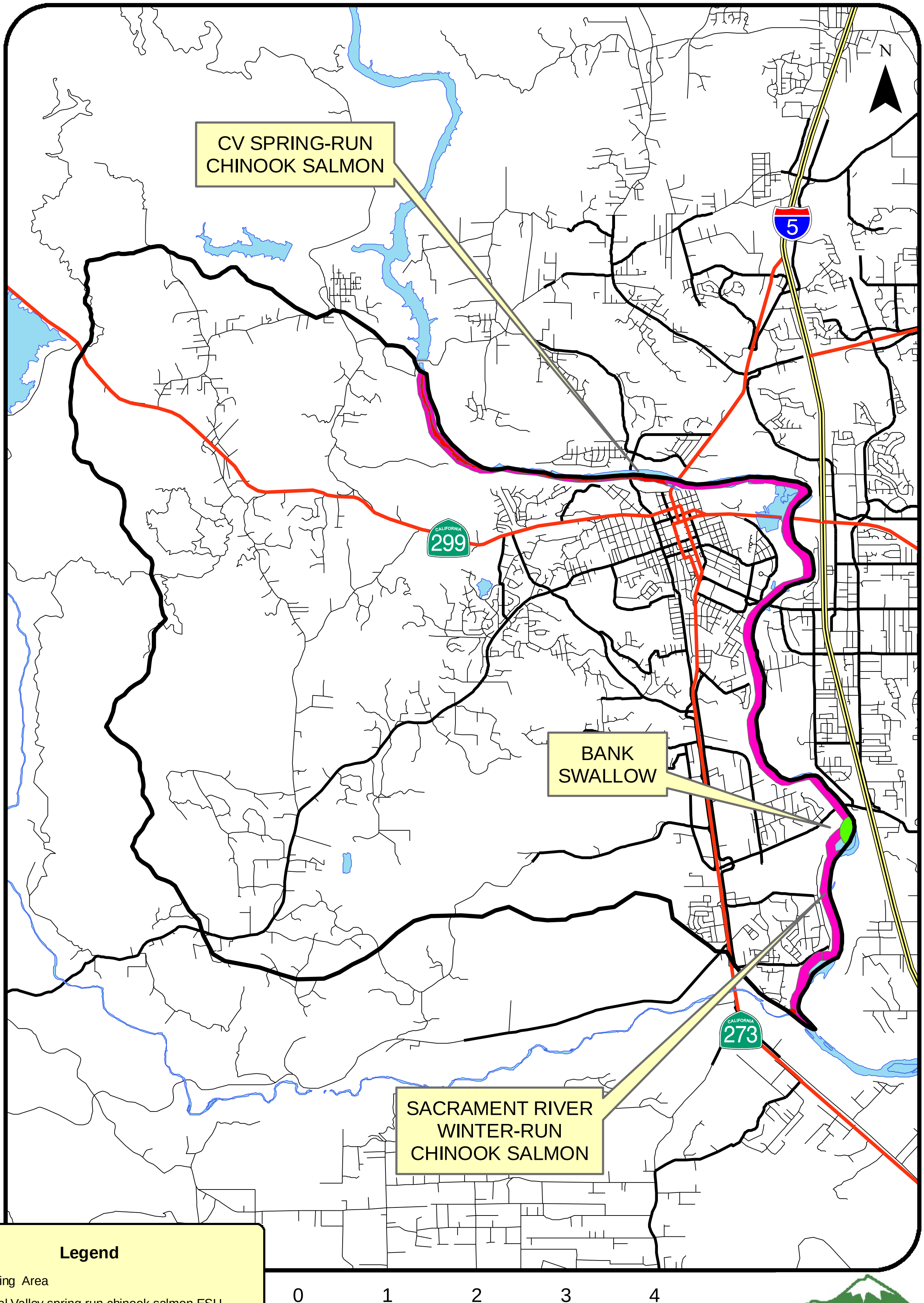
WESTERN SHASTA RESOURCE CONSERVATION DISTRICT

VEGETATION



WESTERN SHASTA RESOURCE CONSERVATION DISTRICT

SPECIAL STATUS WILDLIFE AND PLANT SPECIES



Legend

- Planning Area
- Central Valley spring-run chinook salmon ESU
- Sacramento River winter-run chinook salmon ESU
- bank swallow

WESTERN SHASTA RESOURCE CONSERVATION DISTRICT

2016
SHASTA COUNTY
COMMUNITY WILDFIRE PROTECTION PLAN

SHINGLETOWN/MANTON
PLANNING AREA

Covering the communities of:

- Shingletown
- Manton (north)
- Viola

SHINGLETOWN/MANTON PLANNING AREA
(2016)

I. PROPOSED PROJECTS

A. THE PLANNING AREA

The boundary of the planning area encompasses 107,340 acres and includes the community of Shingletown, located approximately 25 miles east of Redding, California. Other communities that lie within the Plan boundary include Viola on the eastern end and Manton on the south. There are approximately 5,411 residents living within the Plan boundary. The area is used heavily for recreation during the summer months – substantially increasing the number of people using the land during the height of fire season. Land ownership is approximately 4% public, including Bureau of Land Management and USDA Forest Service, and 96% private, including commercial forest land owned by Sierra Pacific Industries (SPI) and land managed by W.M. Beaty and Associates, Inc. (W.M. Beaty), and other private land ownership. The Bear Creek Watershed Group remains as an active organization in Shingletown.

This area can be reached from State Highway 44 east and west, which is the major two-lane highway connecting Redding and Lassen Volcanic National Park. The topography of the area varies with elevations from 350 feet at the confluence with the Sacramento River on the west end to 4,400 feet at the eastern end. The majority of the watershed has remained relatively undeveloped over time and provides high quality water to the Sacramento River.

The Battle Creek Watershed (in Shasta County) includes the communities of Mineral and Manton and encompasses about 410 square miles or approximately 262,400 acres, and lies along the north border of Tehama County on the east side of the Sacramento River. Approximately 54,910 acres lies within the planning area. The elevation of the watershed ranges from 330 feet on its western end along the Sacramento River to 10,470 feet at the top of Lassen Peak. Land ownership includes Lassen National Park, the USDA Forest Service, Bureau of Land Management, large commercial timberland and small private landowners.

B. PROJECT PRIORITIES

SHINGLETOWN/MANTON PLANNING AREA FUEL REDUCTION PROJECTS				
PROPOSED PROJECT	**MAP NUMBER[1]**	**TYPE**	**AREA (acres)**	**ESTIMATED COST[2]**
Shingletown Ridge Road	1	Fuelbreak	6.3	$797,236
A-Line Viola North	2	Fuelbreak	5.0	$632,727
100 Road (West/70HH)	3	Fuelbreak	11.5	$1,455,273
Black Butte Road	4	Fuelbreak	3.2	$404,945
Emigrant Trail West	5	Fuelbreak	3.3	$417,600
Ritts Mill Road	6	Fuelbreak	1.8	$227,782
Shasta Forest Village	7	Fuelbreak	3.7	$468,218
McCumber Flats	8	Fuelbreak	3.2	$404,945
Ponderosa Way #1	9	Fuelbreak	1.5	$189,818
Ponderosa Way #3	10	Fuelbreak	3.6	$455,564
Wildcat Road	11	Fuelbreak	2.1	$265,745
Battle Ck Bottom / Wilson Hill	12	Fuelbreak	6.7	$847,855
Ponderosa Way - Bear Creek	13	Fuelbreak	5.5	$696,000
Manton Ponderosa Way	14	Fuelbreak	0.5	$63,273
Sites Road - Plateau Pines	15	Fuelbreak	1.2	$151,855
Plateau Pines East	16	Fuelbreak	0.7	$88,582
Hwy 44 at Dersch Road	17	Fuelbreak	1.2	$151,855
Wilson Hill Road North	18	Fuelbreak	1.5	$189,818
Keswick Ditch / Arbor Drive	19	Fuelbreak	1.1	$139,200
Shingletown Ridge Phase 2	20	Fuelbreak	3.8	$480,873
Woodcutters Way	21	Fuelbreak	0.6	$75,927
A-Line Viola South	22	Fuelbreak	4.4	$556,800
400 Road	23	Fuelbreak	6.6	$835,200
W-3 Viola Chip	24	Fuelbreak	11.0	$1,392,000
Shingle Glen / Whispering Winds	25	Fuelbreak	1.0	$126,545
300 Road W-27	26	Fuelbreak	3.8	$480,873
Shasta Co. = Shasta County; SPI = Sierra Pacific Industries; WMB = W.M. Beaty & Associates.				

[1] Proposed projects are numbered on the map according to priority.
[2] Estimated costs of the projects are for planning purposes only. More accurate costs will be determined for the preparation of project proposals.

The identified fuel reduction projects fall into two categories, defensible space for homes and structures and roadside and ridgeline shaded fuelbreaks intended to create safe ingress and egress for fire personnel and escape routes for residents. The following section describes the individual projects and the asset values at risk. The following table depicts the project name, type, category, and priority.
The identified fuel reduction projects fall into two categories: defensible space for homes and structures and roadside and ridgeline shaded fuelbreaks intended to create safe ingress and egress for fire personnel and escape routes for residents.

Projects were prioritized based on need and factors such as the following:

- Protection of private residences and properties;
- Access or escape route for the public and fire suppression forces;
- Identification of staging areas in conjunction with the fuelbreak development to provide fire suppression forces strategic locations for planning fire management and suppression actions.
- Connections to other fuelbreaks or areas of lower risk.

DEFENSIBLE SPACE/FIREWISE

#1 – Emigrant Trail Area

Proposed Solution: Encourage the development of defensible space/Firewise program.

Ownership = 100 % private land
Number of dwellings = 286
Value of dwellings = $62,920,000
Number of people = 658

Roadside conditions typical of the Shingletown/Manton communities. Note the dense vegetation up to the roadside.

#2 – Black Butte School Area
Proposed Solution: Encourage the development of defensible space/Firewise program.

Ownership = 100 % private land
Number of dwellings = 62
Value of dwellings = $13,020,000
Number of people = 143

FUELBREAKS

#1 – Shingletown Ridge Road

- Vulnerable to wind-driven wildfires, dense fuel loads, and steep terrain;
- Provides emergency ingress/egress; and
- Protects residential and commercial properties.

Proposed Solution:
Construct shaded fuelbreaks near Shingletown Ridge Road.
6.3 miles long x 200 feet across = 153 acres

Shingletown Ridge Road.
Note trees and brush up to asphalt edge.

#2 – A-Line Viola North

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Construct shaded fuelbreaks and brush clearance as needed near the A-Line, north of Viola.
5.0 miles x 200 feet across = 121 acres

Near A-Line Road in Viola.
Note trees and brush up to asphalt edge.

#3 – 100 Road West / 70 HH

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Construct shaded fuelbreaks along 100 Road/70 HH.
5.8 miles long x 200 feet across = 141 acres.

Alternative project: Prescribed burn along 100 Road, treating 170 acres of parcel land.

100 Road. Note debris and brush up to road edge.

#4 – Black Butte Road

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Construct shaded fuelbreaks and brush clearance as needed near Black Butte Road.
3.2 miles x 200 feet across = 78 acres

Black Butte Road.
Note dense trees and brush near asphalt edge.

#5 – Emigrant Trail West

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Construct shaded fuelbreaks and brush clearance as needed near the west side of Emigrant Trail.
3.3 miles x 200 feet across = 80 acres

Emigrant Trail.
Note dense trees and brush up to road edge.

#6 – Ritts Mill Road

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Construct shaded fuelbreaks and brush clearance as needed near Ritts Mill Road.
1.8 miles x 200 feet across = 44 acres

Ritts Mill Road. Fuelbreak is generally good, but needs maintenance and improvement.

#7 – Shasta Forest Village

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Construct shaded fuelbreaks and brush clearance as needed near Shasta Forest Village.
3.7 miles x 200 feet across = 90 acres

#8 – McCumber Flat

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Construct shaded fuelbreaks and brush clearance as needed near McCumber Flat.
3.2 miles x 200 feet across = 78 acres

Near McCumber Flat.
Note dense trees and brush up to road edge

#9 – Ponderosa Way #1

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Construct shaded fuelbreaks and brush clearance as needed near Ponderosa Way.
1.5 miles x 200 feet across = 36 acres

Ponderosa Way.
Note dense trees and brush up to road edge.

#10 – Ponderosa Way #3

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Construct shaded fuelbreaks and brush clearance as needed near the west side of Emigrant Trail.
3.6 miles x 200 feet across = 87 acres

Near Ponderosa Way.
Note dense trees and brush up to road edge.

#11 – Wildcat Road

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Construct shaded fuelbreaks and brush clearance as needed near Wildcat Road.
2.1 miles x 200 feet across = 51 acres

#12 – Battle Creek Bottom / Wilson Hill

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Construct shaded fuelbreaks and brush clearance as needed near Battle Creek Bottom and Wilson Hill Road.
6.7 miles x 200 feet across = 162 acres

#13 – Ponderosa Way / Bear Creek

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Construct shaded fuelbreaks and brush clearance as needed near Ponderosa Way and Bear Creek.
5.5 miles x 200 feet across = 133 acres

#14 – Manton Ponderosa Way

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Construct shaded fuelbreaks and brush clearance as needed near Ponderosa Way in Manton.
0.5 miles x 200 feet across = 12 acres

#15 – Sites Road / Plateau Pines

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Maintain fuelbreak and brush clearance as needed.
3.2 miles x 200 feet across = 78 acres

Sites Road/Plateau Pines Road.
Note the dense vegetation up to the roadside.

#16 – Plateau Pines East

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Maintain shaded fuelbreak and brush clearance as needed near the east side of Plateau Pines Road.
0.7 miles x 200 feet across = 17 acres

#17 – HWY-44E / Dersch Road

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Maintain fuelbreak and brush clearance as needed near HWY-44E and Dersch Road.
1.2 miles x 200 feet across = 29 acres

#18 – Wilson Hill Road North

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Construct shaded fuelbreaks and brush clearance as needed near the north side of Wilson Hill Road.
1.5 miles x 200 feet across = 36 acres

#19 – Keswick Ditch / Arbor Drive

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Construct shaded fuelbreaks and brush clearance as needed near Keswick Ditch and Arbor Drive.
1.1 miles x 200 feet across = 27 acres

#20 – Shingletown Ridge Phase 2

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Construct and expand shaded fuelbreaks as needed approximately ½ mile south of Hwy 44, near Shingletown Ridge Rd and Wilson Hill Rd.
3.8 miles x 200 feet across = 92 acres. *This project is in-progress (2016).*

#21 – Woodcutters Way

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Construct shaded fuelbreaks and brush clearance as needed near Woodcutters Way.
0.6 miles x 200 feet across = 15 acres

#22 – A-Line Viola South

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Construct shaded fuelbreaks and brush clearance as needed near the A-Line in southern Viola.
4.4 miles x 200 feet across = 107 acres

#23 – 400 Road

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Construct shaded fuelbreaks and brush clearance as needed, connecting to the 400 Road.
6.6 miles x 200 feet across = 160 acres

#24 – W-3 Viola Chip

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Construct shaded fuelbreaks and brush clearance as needed near W-3 Road in Viola.
11.0 miles x 200 feet across = 267 acres

#25 – Shingle Glen / Whispering Wind

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Construct shaded fuelbreaks and brush clearance as needed near Shingle Glen and Whispering Wind.
1.0 miles x 200 feet across = 24 acres

#26 – 300 Road W-27

- Vulnerable to wind-driven wildfires, dense fuels, and steep terrain;
- Provides emergency ingress/ egress; and
- Protects residential and commercial properties.

Proposed Solution:
Construct shaded fuelbreaks and brush clearance as needed near 300 Road and W-27.
3.8 miles x 200 feet across = 92 acres

II. COMMUNITY PRIORITIES

A. OVERALL COMMUNITY WILDFIRE RISK ASSESSMENT

SHINGLETOWN/MANTON PLANNING AREA
OVERALL COMMUNITY WILDFIRE RISK ASSESSMENT

Community, structure or area at risk	Map Number	Fuel Hazard	Wildfire Occurrence Risk	Structural Ignitability	Preparedness Capability	Overall Risk	Fire Hazard Severity Zone Rating	WUI
Shingletown Ridge Road	1	High	High	High	Low	High	Very High	Yes
A-Line Viola North	2	High	High	High	Low	High	Very High	Yes
100 Road (West / 70 HH)	3	High	High	High	Low	High	Very High	Yes
Black Butte Road	4	High	High	High	Low	High	Very High	Yes
Emigrant Trail west	5	High	High	High	Low	High	Very High	Yes
Ritts Mills Road	6	High	High	High	Low	High	Very High	Yes
Shasta Forest Village	7	High	High	High	Low	High	Very High	Yes
McCumber Flat	8	High	High	High	Low	High	Very High	Yes
Ponderosa Way #1	9	High	High	High	Low	High	Very High	Yes
Ponderosa Way #3	10	High	High	High	Low	High	Very High	Yes
Wildcat Road	11	High	High	High	Low	High	Very High	Yes
Battle Creek Bottom / Wilson Hill Road	12	High	High	High	Low	High	Very High	Yes
Ponderosa Way / Bear Creek	13	High	High	High	Low	High	Very High	Yes

A. OVERALL COMMUNITY WILDFIRE RISK ASSESSMENT (continued)

SHINGLETOWN/MANTON PLANNING AREA
OVERALL COMMUNITY WILDFIRE RISK ASSESSMENT

Community, structure or area at risk	Map Number	Fuel Hazard	Wildfire Occurrence Risk	Structural Ignitability	Preparedness Capability	Overall Risk	Fire Hazard Severity Zone Rating	WUI
Manton Ponderosa Way	14	High	High	High	Low	High	Very High	Yes
Sites Road / Plateau Pines Road	15	High	High	High	Low	High	Very High	Yes
Plateau Pines Road East	16	High	High	High	Low	High	Very High	Yes
HWY-44E / Dersch Road	17	High	High	High	Low	High	Very High	Yes
Wilson Hill Road North	18	High	High	High	Low	High	Very High	Yes
Keswick Ditch / Arbor Drive	19	High	High	High	Low	High	Very High	Yes
Shingletown Ridge Phase 2	20	High	High	High	Low	High	Very High	Yes
Woodcutters Way	21	High	High	High	Low	High	Very High	Yes
A-Line Viola South	22	High	High	High	Low	High	Very High	Yes
400 Road	23	High	High	High	Low	High	Very High	Yes
W-3 Viola Chip	24	High	High	High	Low	High	Very High	Yes
Shingle Glen / Whispering Wind	25	High	High	High	Low	High	Very High	Yes
300 Road W-27	26	High	High	High	Low	High	Very High	Yes

B. OVERALL COMMUNITY HAZARD REDUCTION ASSESSMENT

SHINGLETWON/MANTON PLANNING AREA OVERALL COMMUNITY HAZARD REDUCTION ASSESSMENT					
Community, structure or area at risk	**Map Number**	**Overall Risk**	**Cultural Value**	**Treatment Type**	**Treatment Method**
Shingletown Ridge Road	1	High	Low	Fuelbreak	Brush and tree removal, pruning
A-Line Viola North	2	High	Low	Fuelbreak	Brush and tree removal, pruning
100 Road (West / 70 HH)	3	High	Low	Fuelbreak	Brush and tree removal, pruning
Black Butte Road	4	High	Low	Fuelbreak	Brush and tree removal, pruning
Emigrant Trail west	5	High	Low	Fuelbreak	Brush and tree removal, pruning
Ritts Mills Road	6	High	Low	Fuelbreak	Brush and tree removal, pruning
Shasta Forest Village	7	High	Low	Fuelbreak	Brush and tree removal, pruning
McCumber Flat	8	High	Low	Fuelbreak	Brush and tree removal, pruning
Ponderosa Way #1	9	High	Low	Fuelbreak	Brush and tree removal, pruning
Ponderosa Way #3	10	High	Low	Fuelbreak	Brush and tree removal, pruning
Wildcat Road	11	High	Low	Fuelbreak	Brush and tree removal, pruning
Battle Creek Bottom / Wilson Hill Road	12	High	Low	Fuelbreak	Brush and tree removal, pruning
Ponderosa Way / Bear Creek	13	High	Low	Fuelbreak	Brush and tree removal, pruning

B. OVERALL COMMUNITY HAZARD REDUCTION ASSESSMENT (continued)

SHINGLETWON/MANTON PLANNING AREA OVERALL COMMUNITY HAZARD REDUCTION ASSESSMENT					
Community, structure or area at risk	**Map Number**	**Overall Risk**	**Cultural Value**	**Treatment Type**	**Treatment Method**
Manton Ponderosa Way	14	High	Low	Fuelbreak	Brush and tree removal, pruning
Sites Road / Plateau Pines Road	15	High	Low	Fuelbreak	Brush and tree removal, pruning
Plateau Pines Road East	16	High	Low	Fuelbreak	Brush and tree removal, pruning
HWY-44E / Dersch Road	17	High	Low	Fuelbreak	Brush and tree removal, pruning
Wilson Hill Road North	18	High	Low	Fuelbreak	Brush and tree removal, pruning
Keswick Ditch / Arbor Drive	19	High	Low	Fuelbreak	Brush and tree removal, pruning
Shingletown Ridge Phase 2	20	High	Low	Fuelbreak	Brush and tree removal, pruning
Woodcutters Way	21	High	Low	Fuelbreak	Brush and tree removal, pruning
A-Line Viola South	22	High	Low	Fuelbreak	Brush and tree removal, pruning
400 Road	23	High	Low	Fuelbreak	Brush and tree removal, pruning
W-3 Viola Chip	24	High	Low	Fuelbreak	Brush and tree removal, pruning
Shingle Glen / Whispering Wind	25	High	Low	Fuelbreak	Brush and tree removal, pruning
300 Road W-27	26	High	Low	Fuelbreak	Brush and tree removal, pruning

III. COMMUNITY VALUES

RESIDENCES AND MAJOR STRUCTURES

Fishing

Both cold and warm water fishing are popular on Shingletown Ridge and in the Battle Creek and Bear Creek drainages. Small mouth bass and blue gill are caught in Bear Creek up to 1,000 feet elevation, while rainbow trout are supported in Bear Creek and Battle Creek. Grace, Nora, and McCumber Lakes support rainbow trout and brown trout, and brown trout, rainbow trout, and bullhead are found in Lake McCumber. Woodridge Lake also supports an excellent trout fishery, but is not open to the public. The pond at Bear Creek Trading Post offers rainbow trout fishing for a fee. Bailey Creek, North Fork of Battle Creek, Millseat Creek, and all diverted water support rainbow trout.

Hunting

The planning area contains important deer migration routes. Deer, bear, and turkey are hunted throughout the planning area, especially on lands north of Highway 44 leased by local gun clubs. Quail, dove, and the Bandtail Pigeon are hunted. Between November 15 and March 1 fur trapping is allowed and species taken include bobcat, coyote, mink, raccoon, and muskrat.

Highway 44 Corridor

Highway 44 is the main highway between Interstate 5 and Lassen Volcanic National Park, an area that offers a year-round complex of outdoor recreation resources and has been designated a gateway to the Lassen Crossroads National Scenic Byway by the USDA Forest Service. As Highway 44 merges with Highway 89 at Lassen Volcanic National Park, it becomes part of the "Volcanic Legacy Scenic Byway," a 500 mile route that begins as a loop around Lassen Volcanic National Park, and ends just north of Crater Lake National Park near Mount Thielsen in Oregon. Driving the "volcano to volcano" route for pleasure attracts tourists in both summer and winter.

Scenic Views

Long vistas of Mount Shasta and the forests that surround it are possible from Shasta Forest Village, some locations along Highway 44, Westmoore Road, and in the Midway area. Lassen Peak vistas are visible from locations on the west side of meadows and Lake McCumber in the eastern third of the planning area. Canyon views can be observed from the roads leading north and south off the ridge and into Battle Creek south of the Site Road/Pegnon Acres settlements. The Ash Creek drainage provides middle foreground to the views from the east side of Shingletown Ridge Road and the Weston House Bed & Breakfast. Canyon views are also visible to the northwest from Ponderosa Way and Westmoore.

Throughout the area, forest scenes viewed from homes and roads are attractive. Lassen Peak is visible from the highway as drivers pass through large meadows in the eastern third of the planning area. Meadows and glades are scenic resources throughout the planning area, although some of these locations are being invaded by brush and trees and would be improved by the application of prescribed fire. Meadows and glades double as potential safety zones for residents and firefighters and as fuelbreaks. As a middle foreground, meadows are second only to lakes in scenic value.

Brush fields offer less attractive scenes (and offer evidence of past stand-replacing fire events) and do not inspire the same kind of interest and attention provided by meadows and lakes. Brush fields are found throughout the planning area and along Highway 44 and large brush fields are found near the airport and west of the planning area. They are also visible on hillsides to the northeast and on the canyon slopes to the south and north of the planning area.

Residential Environments

The landscapes of residential settlements are a particularly sensitive aesthetic resource. Research has demonstrated that as many as one in five residents in the wildland-urban interface feel a lush landscape today is more important than saving their home from a wildfire that might occur. Comments in focus groups and public meetings reinforce the notion that a thick forested landscape is essential to the quality of life they experience as part of living in the Shingletown community (Hodgson, 1993).

In community discussions the importance of the landscape arose many times. Saving the landscape from catastrophic fire was a common motivation of those strongly supporting hazard fuel reduction efforts; while others objected to removal of the understory for fear the openness would decrease their privacy. Those people in particular wanted to keep the landscape in what they perceived to be a natural state.

Many of the residential areas have covenants, conditions, and restrictions (CC&Rs) restricting logging and tree removal in order to protect the aesthetics of the landscaping around homes. The energy with which these restrictions are enforced testifies to the importance of the landscape as an aesthetic resource.

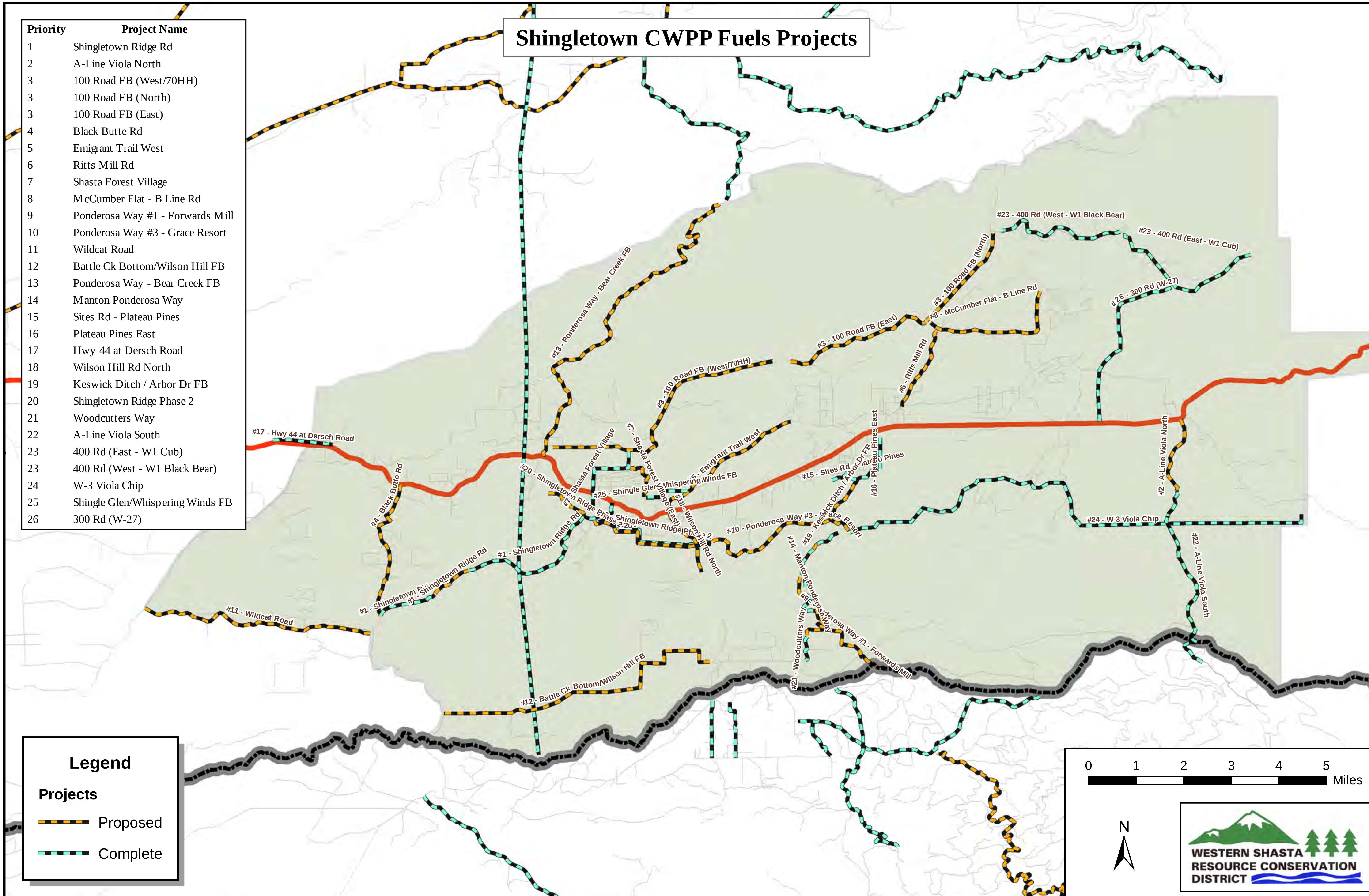
Historical

Of historical interest is the Aldridge Ranch, the second longest continually owned ranch in Shasta County. It was purchased in 1862, and contains approximately 5,000 acres of ranchland. This area has been subjected to a CAL FIRE Vegetation Management Plan (VMP) which used prescribed burning (Section VI) to reduce the fuel load on the ranch.

Anselmo Vineyards sits on about 2,400 acres of land north of Hwy 44.

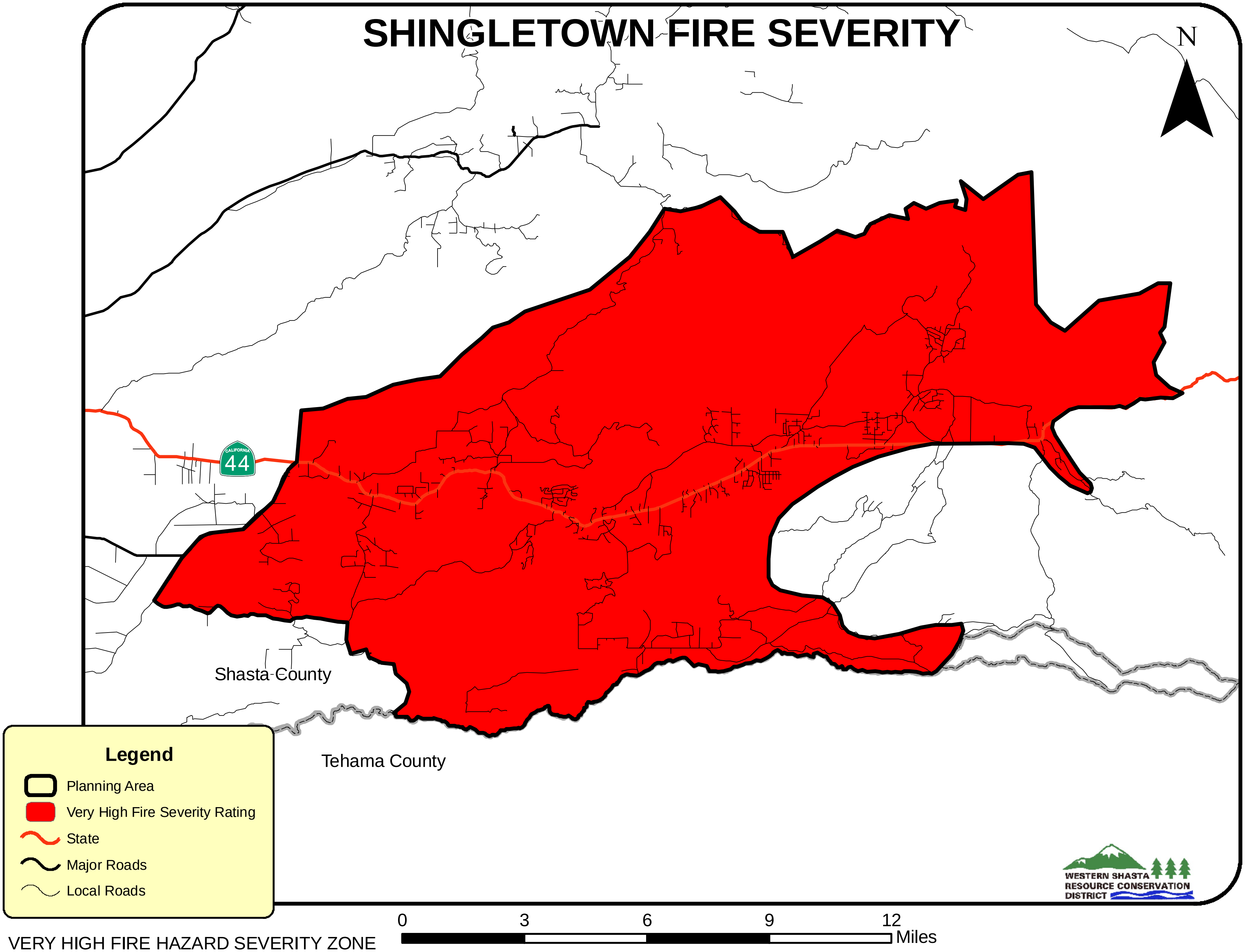
MAPS OF THE SHINGLETOWN/MANTON PLANNING AREA

1. SHINGLETOWN/MANTON PROPOSED PROJECTS AND PLANNING AREA
2. FIRE SEVERITY RATING
3. VEGETATION
4. SPECIAL STATUS SPECIES AND HABITAT


Shingletown CWPP Fuels Projects
Priority | Project Name
1 Shingletown Ridge Rd
2 A-Line Viola North
3 100 Road FB (West/70HH)
3 100 Road FB (North)
3 100 Road FB (East)
4 Black Butte Rd
5 Emigrant Trail West
6 Ritts Mill Rd
7 Shasta Forest Village
8 McCumber Flat - B Line Rd
9 Ponderosa Way #1 - Forwards Mill
10 Ponderosa Way #3 - Grace Resort
11 Wildcat Road
12 Battle Ck Bottom/Wilson Hill FB
13 Ponderosa Way - Bear Creek FB
14 Manton Ponderosa Way
15 Sites Rd - Plateau Pines
16 Plateau Pines East
17 Hwy 44 at Dersch Road
18 Wilson Hill Rd North
19 Keswick Ditch / Arbor Dr FB
20 Shingletown Ridge Phase 2
21 Woodcutters Way
22 A-Line Viola South
23 400 Rd (East - W1 Cub)
23 400 Rd (West - W1 Black Bear)
24 W-3 Viola Chip
25 Shingle Glen/Whispering Winds FB
26 300 Rd (W-27)
Legend
Projects
Proposed
Complete
0 1 2 3 4 5 Miles
N
WESTERN SHASTA RESOURCE CONSERVATION DISTRICT
#17 - Hwy 44 at Dersch Road
#11 - Wildcat Road
#12 - Battle Ck Bottom/Wilson Hill FB
#13 - Ponderosa Way - Bear Creek FB
#3 - 100 Road FB (West/70HH)
#3 - 100 Road FB (East)
#3 - 100 Road FB (North)
#8 - McCumber Flat - B Line Rd
#23 - 400 Rd (West - W1 Black Bear)
#23 - 400 Rd (East - W1 Cub)
#26 - 300 Rd (W-27)
#6 - Ritts Mill Rd
#16 - Plateau Pines East
#2 - A-Line Viola North
#24 - W-3 Viola Chip
#22 - A-Line Viola South
#5 - Emigrant Trail West
#15 - Sites Rd
#10 - Ponderosa Way #3
#14 - Manton Ponderosa Way
#21 - Woodcutters Way
#4 - Black Butte Rd
#1 - Shingletown Ridge Rd
#25 - Shingle Glen/Whispering Winds FB
#7 - Shasta Forest Village
#18 - Wilson Hill Rd North
#19 - Keswick Ditch / Arbor Dr FB
#20 - Shingletown Ridge Phase 2

MAP 2

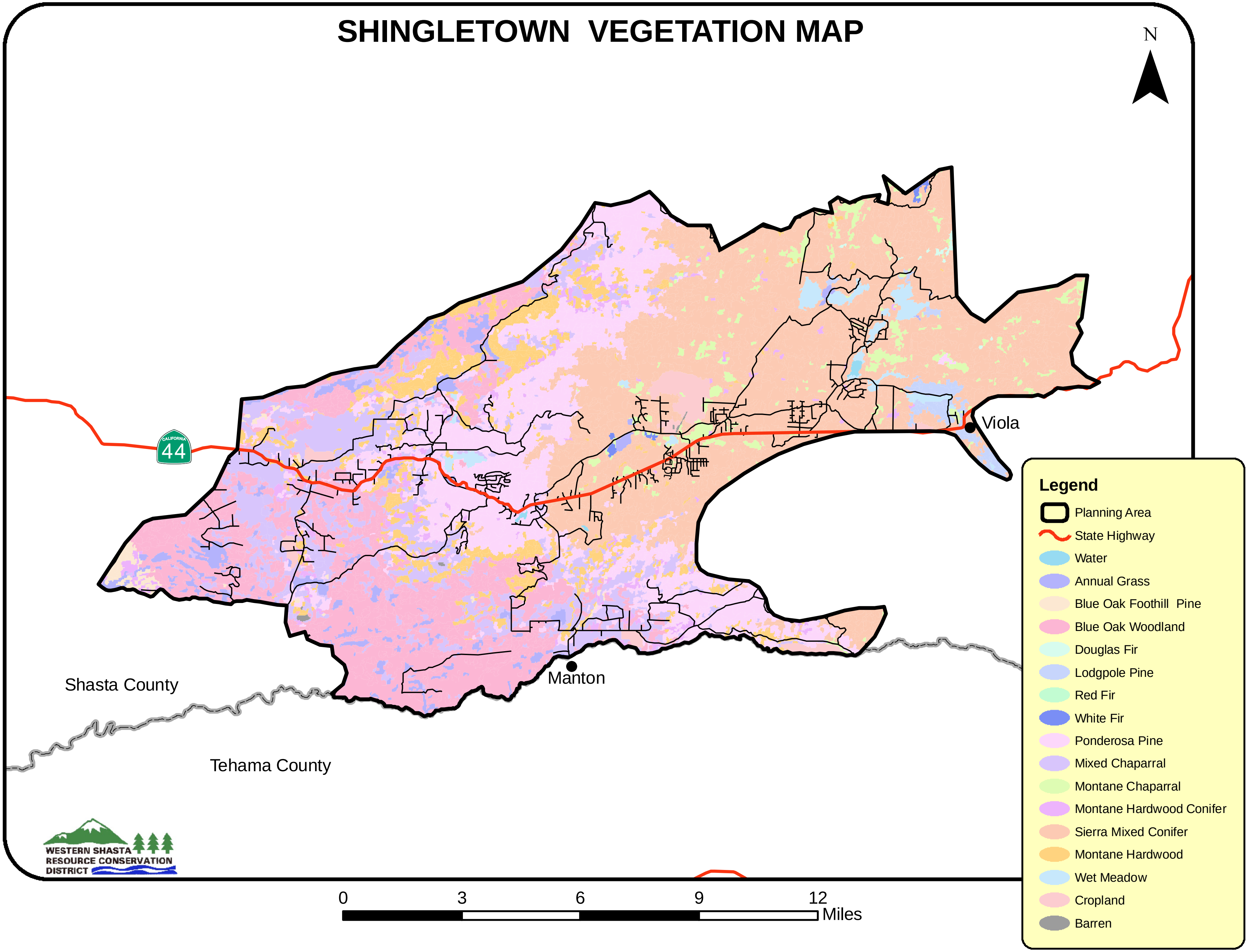
SHINGLETOWN FIRE SEVERITY



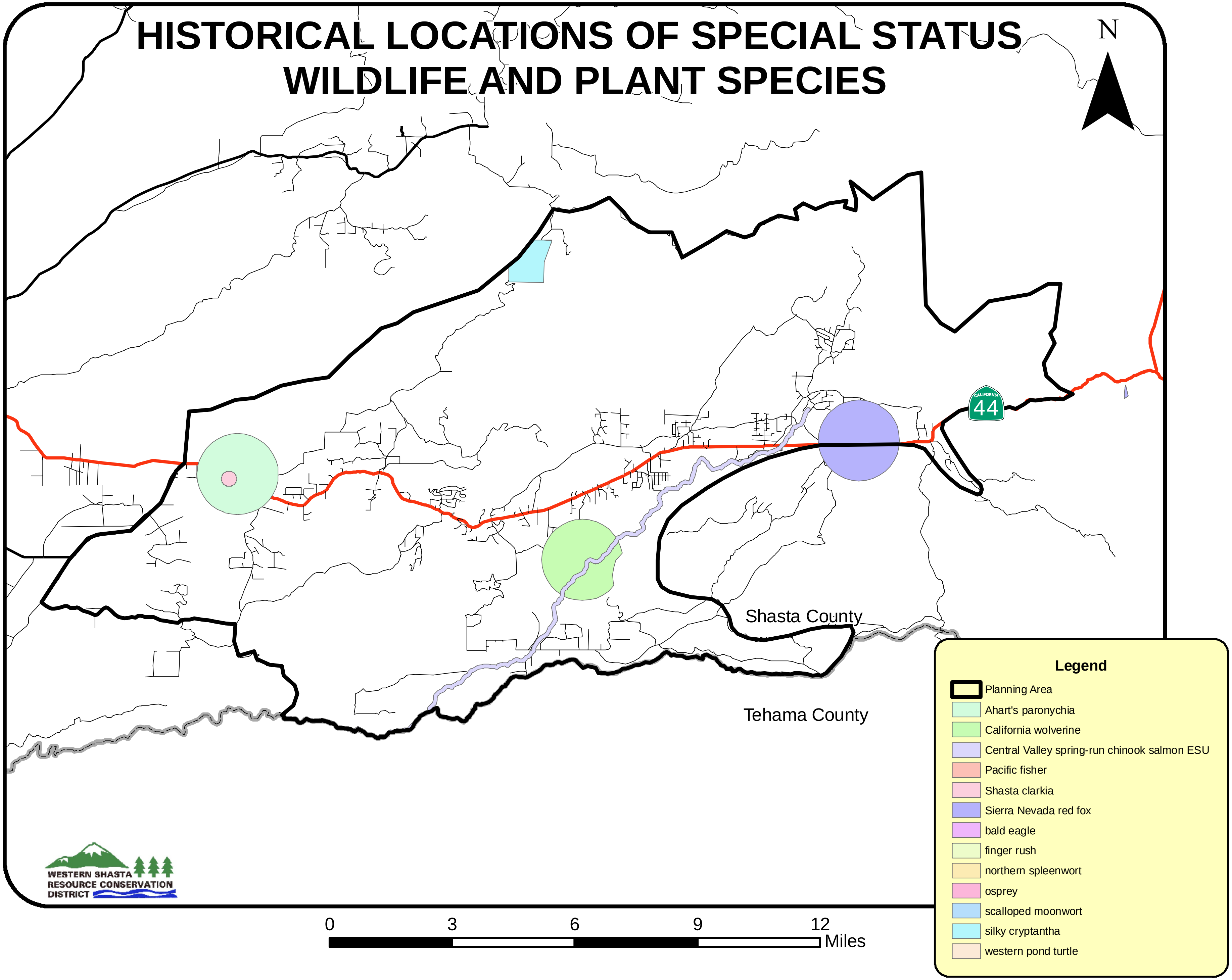
VERY HIGH FIRE HAZARD SEVERITY ZONE
as Recommended By CAL FIRE

MAP 3

SHINGLETOWN VEGETATION MAP



MAP 4



HISTORICAL LOCATIONS OF SPECIAL STATUS WILDLIFE AND PLANT SPECIES
N
44
CALIFORNIA
Shasta County
Tehama County
WESTERN SHASTA RESOURCE CONSERVATION DISTRICT
0
3
6
9
12
Miles
Legend
Planning Area
Ahart's paronychia
California wolverine
Central Valley spring-run chinook salmon ESU
Pacific fisher
Shasta clarkia
Sierra Nevada red fox
bald eagle
finger rush
northern spleenwort
osprey
scalloped moonwort
silky cryptantha
western pond turtle

2016
SHASTA COUNTY
COMMUNITY WILDFIRE PROTECTION PLAN

STILLWATER-CHURN CREEK PLANNING AREA

Covering the communities of:

- Bella Vista (west)
- City of Redding (east)
- City of Shasta Lake

STILLWATER-CHURN CREEK PLANNING AREA (2016)

I. PROPOSED PROJECTS

A. THE PLANNING AREA

The planning area of the Stillwater-Churn Creek watershed is located in southwestern Shasta County. The planning area includes the Stillwater and Churn Creek drainages, and in order to help facilitate wildfire logistics planning, includes adjacent fringes of land outside of the drainages' northern boundary. The planning area covers approximately 94,096 acres and includes the eastern and northern suburbs of Redding, most of Shasta Lake City, and many rural homes and subdivisions outside of the cities' boundaries.

The Study Area contains a population of approximately 75,000 people, a significant portion of the population of Shasta County (176,000) and contains many "bedroom communities" for the City of Redding (WSRCD, 2007). While portions of the cities of Redding and Shasta Lake are densely populated large areas of rural subdivisions and scattered rural home sites exist in the study area. Many portions of the Study Area contain scattered residences, rural subdivisions, or mixes of commercial and residential properties.

The headwaters of both the Stillwater and Churn Creek watersheds begin in the hills between Redding and Shasta Lake and flow in a north to south direction, entering the Sacramento River south of Redding. The steep, hilly headwaters do not exceed 2,500 feet in elevation, but constitute a heavy precipitation zone that receives over 60 inches of rain annually. Annual precipitation tapers down from north to south, with the southern fringe of the Study Area receiving about 30 inches of annual rainfall.

Snowfall is rare in the southern half of the Study Area, but more common above 1,000' elevations along the northern portions. Even so, a snowpack does not form and, consequently, rainfall and to a much lesser extent spring discharge, is responsible for stream flows. Because of this, both streams were originally ephemeral, with no flows during the summers, but during the past century irrigation runoff from fields and urban areas results in portions of Stillwater and Churn Creeks flowing perennially.

Transportation Facilities—Redding Municipal Airport; Interstate 5; Highway 299; and Highway 44
Community Welfare Facilities—Police and Fire Stations; Powerlines; Waterlines; and Sewage Treatment Sites
Miscellaneous—Public and Private School; City and Community Parks

B. PROJECT PRIORITIES

STILLWATER-CHURN CREEK PLANNING AREA FUEL REDUCTION PROJECTS				
PROPOSED PROJECT	**MAP NUMBER[1]**	**TYPE**	**AREA (acres)**	**ESTIMATED COST[2]**
North Shasta Lake City	1	Fuelbreak	66	$342,938
North East Shasta Lake City	2	Fuelbreak	33	$170,836
Fawndale Community	3	Fuelbreak	41	$215,127
Elk Trail West	4	Fuelbreak	51	$265,745
Dry Creek Road	5	Fuelbreak	133	$696,000
Old Oregon Trail North	6	Fuelbreak	80	$417,600
Akrich	7	Fuelbreak	29	$151,855
Pine Grove	8	Fuelbreak	63	$329,018
Quartz Hill Rd/Benton	9	Fuelbreak	39	$202,473
Quartz Hill Rd near River Ridge Rd	10	Fuelbreak	15	$75,927
Intermountain Rd	11	Fuelbreak	75	$392,291
Highway 44 near Stillwater Rd	12	Fuelbreak	36	$189,818
Creek Trl	13	Fuelbreak	41	$215,127
Highway 299E near Shasta College	14	Fuelbreak	46	$240,436
Keswick Dam Rd East	15	Fuelbreak	24	$126,545

The identified fuel reduction projects fall into two categories:

1. defensible space for homes and structures, and
2. roadside and ridgeline shaded fuelbreaks intended to create safe ingress and egress for fire personnel and escape routes for residents.

Projects were prioritized based on need and factors such as the following:

- Protection of private residences and properties;
- Access or escape route for the public and fire suppression forces;

[1] Proposed projects are numbered on the map according to priority.
[2] Estimated costs of the projects are for planning only. More accurate costs will be determined for the preparation of project proposals.

- Identification of staging areas in conjunction with the fuelbreak development to provide fire suppression forces strategic locations for planning fire management and suppression actions.
- Connections to other fuelbreaks or areas of lower risk.

Landowners and residents are strongly encouraged to develop defensible space or maintain the fuels reduction projects on their properties to keep the integrity of the work done and to show project sustainability which could lead to additional future projects.

STILLWATER-CHURN CREEK PLANNING AREA BASIC ASSUMPTIONS[3]	
Estimated cost of fuelbreak (roadside)	$5,220 per acre
Estimated cost of fuelbreak (ridgetop or off-road)	$7,310 per acre
Estimated cost of defensible space (hand labor)	$600 per dwelling (<1 acre)
Standard fuelbreak width	200 feet
Right-Of-Way (ROW) width	< 100 feet
Population	2.6 per dwelling
Property Value (~ $201,250 - $475,000 per dwelling)	$260,000
Schools	$145,000,000
Commercial Structures Value[4]	$415,500 – $23,900,000

#1 – North Shasta Lake City

- Prevents wildland fires from progressing south into the City of Shasta Lake.

Proposed Solution:
Construct shaded fuelbreaks along the north perimeter of the City of Shasta Lake:
2.7 miles long x 200 feet across = 66 acress

[3] Estimated costs of the projects are for planning only. More accurate costs will be determined for the preparation of project proposals.
[4] County assessed values, 2010

#2 – North East Shasta Lake City

- Prevents wildland fires from progressing southwest into the City of Shasta Lake.
- Protects Grand Oak Elementary School.

Proposed Solution:
Maintain shaded fuelbreak along the northeast perimeter of the City of Shasta Lake:
1.4 miles long x 200 feet across = 33 acres

#3 – Fawndale Community

- Densely vegetated and in close-proximity to Interstate-5.
- Prevents wildland fires from progressing south and west into Interstate-5.
- Protects the community along Fawndale Road and Mountain Gate.

Proposed Solution:
Construct shaded fuelbreaks around the community on Fawndale Road:
1.7 miles long x 200 feet across = 41 acres

#4 – Elk Trail West

- Densely vegetated.
- Allows emergency ingress/egress for rural areas in Bella Vista (west) to Dry Creek Road.
- Protects the communities between Bear Mountain Road and Dry Creek Road.

Proposed Solution:
Construct shaded fuelbreaks near Elk Trail West:
2.1 miles long x 200 feet across = 51 acres

#5 – Dry Creek Road

- Densely vegetated and in close-proximity to HWY-299E.
- Allows emergency ingress/egress for rural areas north of Bella Vista.
- Protects the communities between Bear Mountain Road and Dry Creek Road.

Proposed Solution:
Construct shaded fuelbreaks near Dry Creek Road:
5.5 miles long x 200 feet across = 133 acres

#6 – Old Oregon Trail North

- Densely vegetated and in close-proximity to HWY-299E.
- Allows emergency ingress/egress for rural areas north of Bella Vista.
- Protects the communities between Bear Mountain Road and Dry Creek Road.

Proposed Solution:
Construct shaded fuelbreaks up to the right-of-way along Old Oregon Trail:
3.3 miles long x 100 feet across = 40 acres

#7 – Akrich Street

- Densely vegetated and in close-proximity to Interstate-5.
- Allows emergency ingress/egress for rural areas in northeast Redding.
- Protects the communities north of Oasis Road to Interstate-5 and high-voltage powerlines.
- Prevent fires wildland fires from moving west into subdivision.

Proposed Solution:
Construct shaded fuelbreaks near Akrich Street:
1.2 miles long x 200 feet across = 29 acres

#8 – Pine Grove Avenue

- Densely vegetated and in close-proximity to Interstate-5.
- Connects Interstate-5 to Lake Blvd, allowing emergency ingress/egress for rural areas between the City of Shasta Lake and northwest Redding.

Proposed Solution:
Construct shaded fuelbreaks near Pine Grove Avenue:
2.6 miles long x 200 feet across = 63 acres

#9 – Quartz Hill Road / Benton

- Highly populated area within Redding city limits.
- Protects multiple subdivisions and high-voltage power lines.
- Up-slope terrain provides high-risk for fire spread.
- Emergency egress/ingress for rural areas S of Lake Blvd./Fuelbreak

Proposed Solution:
Construct shaded fuelbreaks near Quartz Hill Road and Benton Drive:
1.6 miles long x 200 feet across = 39 acres

#10 – Quartz Hill Road near River Ridge Drive

- Highly populated area north of the Sacramento River.
- Protects multiple subdivisions and high-voltage power lines.
- Densely vegetated and uneven terrain.

Proposed Solution:
Construct shaded fuelbreaks north of Quartz Hill Road and River Ridge Drive:
0.6 miles long x 200 feet across = 15 acres

#11 – Intermountain Road

- Densely vegetated and uneven terrain
- Protects high-voltage power lines.
- Allows emergency ingress/egress for rural areas in northeast Redding, between HWY-299E and Bear Mountain Road.

Proposed Solution:
Construct shaded fuelbreaks near Intermountain Road:
3.1 miles long x 200 feet across = 75 acres

#12 – HWY-44 near Stillwater Road

- Densely vegetated and uneven terrain
- Protects high-voltage power lines, industrial parks, and residences.
- Allows emergency ingress/egress for rural areas in northeast Redding, near HWY-44E.

Proposed Solution:
Construct shaded fuelbreaks near HWY-44E:
1.5 miles long x 200 feet across = 36 acres

#13 – Creek Trail ROW

- Densely vegetated and uneven terrain
- Protects high-voltage power lines and rural residences.
- Allows emergency ingress/egress for rural areas in northeast Redding, near HWY-299E.

Proposed Solution:
Construct shaded fuelbreaks up to the right-of-way along Creek Trail:
1.7 miles long x 100 feet across = 21 acres

#14 – HWY-299E near Shasta College

- Main transportation route.
- Protects schools, farms, and rural residences.
- Allows emergency ingress/egress for rural areas in northeast Redding, near HWY-299E.

Proposed Solution:
Construct shaded fuelbreaks near HWY-299E and Shasta College:
1.9 miles long x 200 feet across = 46 acres

#15 – Keswick Dam Road East

- Close proximity to railroad.
- Protects schools and multiple subdivisions.
- Allows emergency ingress/egress for rural areas in northeast Redding, near HWY-299E.

Proposed Solution:
Construct shaded fuelbreak near Keswick Dam Road between Quartz Hill Rd and Lake Blvd.
1.0 miles long x 200 feet across = 24 acres

II. COMMUNITY PRIORITIES

A. OVERALL COMMUNITY WILDFIRE RISK ASSESSMENT

STILLWATER-CHURN CREEK PLANNING AREA
OVERALL COMMUNITY WILDFIRE RISK ASSESSMENT

Community, structure or area at risk	Map Number	Fuel Hazard	Wildfire Occurrence Risk	Structural Ignitability	Preparedness Capability	Overall Risk	Fire Hazard Severity Zone Rating	WUI
North Shasta Lake City	1	High	High	High	Low	High	Very High	Yes
North East Shasta Lake City	2	High	High	High	Low	High	Very High	Yes
Fawndale Community	3	High	High	High	Low	High	Very High	Yes
Elk Trail West	4	High	High	High	Low	High	Very High	Yes
Dry Creek Road	5	High	High	High	Low	High	Very High	Yes
Old Oregon Trail North	6	High	High	High	Low	High	Very High	Yes
Akrich	7	High	High	High	Low	High	Very High	Yes
Pine Grove	8	High	High	High	Low	High	Very High	Yes
Quartz Hill Rd / Benton	9	High	High	High	Low	High	Very High	Yes
Quartz Hill Rd near River Ridge Rd	10	High	High	High	Low	High	Very High	Yes
Intermountain Rd	11	High	High	High	Low	High	Very High	Yes
HWY-44 near Stillwater Rd	12	High	High	High	Low	High	Very High	Yes
Creek Trail	13	High	High	High	Low	High	Very High	Yes
HWY-299E near Shasta College	14	High	High	High	Low	High	Very High	Yes
Keswick Dam Rd East	15	High	High	High	Low	High	Very High	Yes

B. OVERALL COMMUNITY HAZARD REDUCTION ASSESSMENT

STILLWATER-CHURN CREEK PLANNING AREA
OVERALL COMMUNITY HAZARD REDUCTION ASSESSMENT

Community, structure or area at risk	Map Number	Overall Risk	Cultural Value	Treatment Type	Treatment Method
North Shasta Lake City	1	High	High	Fuelbreak	Brush and tree removal, pruning
North East Shasta Lake City	2	High	High	Fuelbreak	Brush and tree removal, pruning
Fawndale Community	3	High	High	Fuelbreak	Brush and tree removal, pruning
Elk Trail West	4	High	High	Fuelbreak	Brush and tree removal, pruning
Dry Creek Road	5	High	High	Fuelbreak	Brush and tree removal, pruning
Old Oregon Trail North	6	High	High	Fuelbreak	Brush and tree removal, pruning
Akrich	7	High	High	Fuelbreak	Brush and tree removal, pruning
Pine Grove	8	High	High	Fuelbreak	Brush and tree removal, pruning
Quartz Hill Rd / Benton	9	High	High	Fuelbreak	Brush and tree removal, pruning
Quartz Hill Rd near River Ridge Rd	10	High	High	Fuelbreak	Brush and tree removal, pruning
Intermountain Rd	11	High	High	Fuelbreak	Brush and tree removal, pruning
HWY-44 near Stillwater Rd	12	High	High	Fuelbreak	Brush and tree removal, pruning
Creek Trail	13	High	High	Fuelbreak	Brush and tree removal, pruning
HWY-299E near Shasta College	14	High	High	Fuelbreak	Brush and tree removal, pruning
Keswick Dam Rd East	15	High	High	Fuelbreak	Brush and tree removal, pruning

III. COMMUNITY VALUES

RESIDENCES & MAJOR STRUCTURES

The Stillwater-Churn Creek planning area is heavily urbanized and surrounded by natural landscapes. The planning area encompasses the main commercial businesses, such as multiple malls and shopping complexes.
The landscapes of residential settlements are a particularly sensitive aesthetic resource. Research has demonstrated that as many as one in five residents in the wildland-urban intermix feel a lush landscape today is more important than saving their home from a wildfire that may or may not occur. Comments in focus groups and public meetings reinforce the notion that rich vegetation across the landscape is essential to the quality of life they experience as part of living in a forest landscape. The following are common structures in this planning area:

- Mt. Shasta Mall
- Shopping complexes
- Shasta College
- Industrial parks
- Turtle Bay/Sundial Bridge

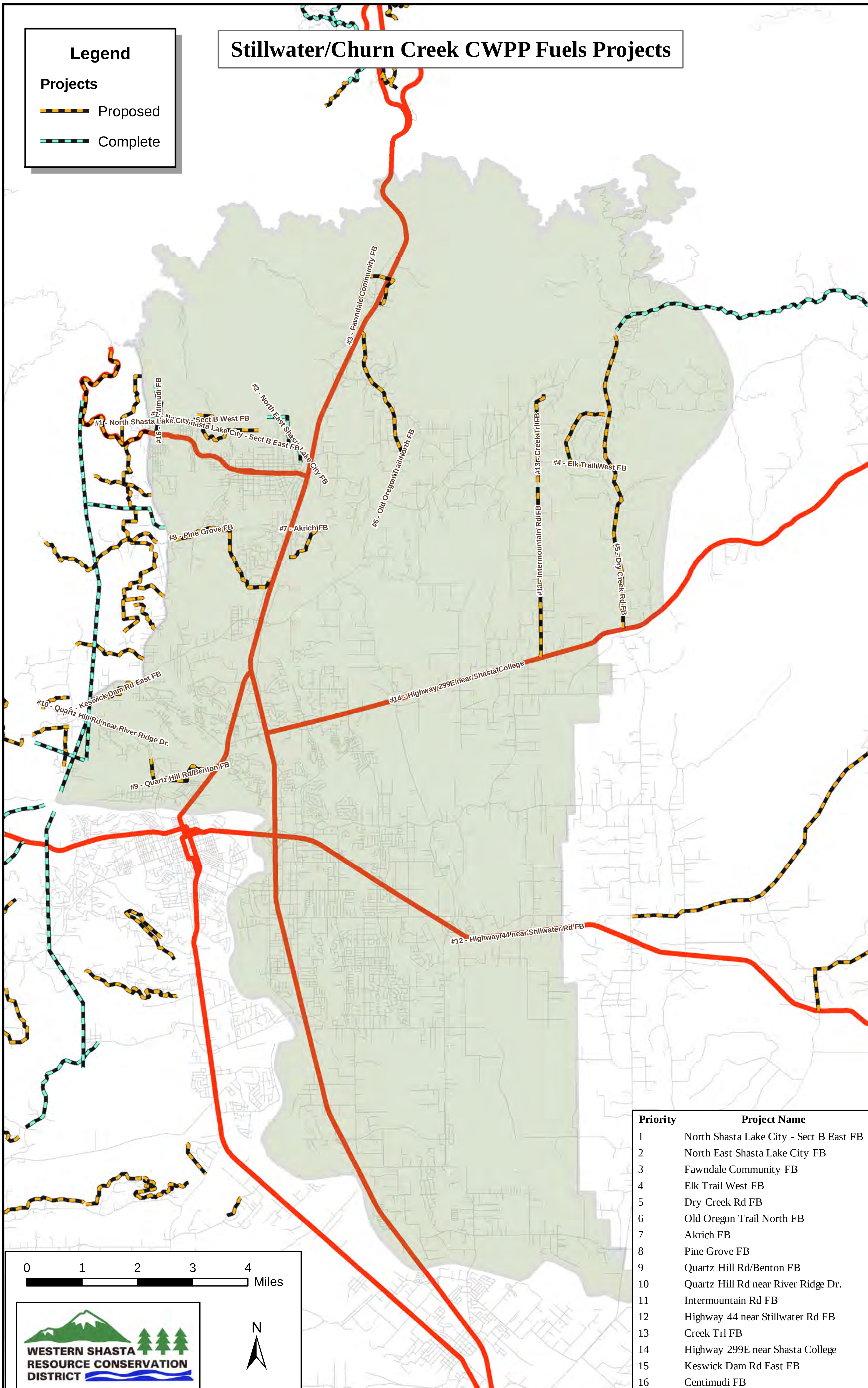
Mt. Shasta Mall

Sundial Bridge at Turtle Bay crossing the

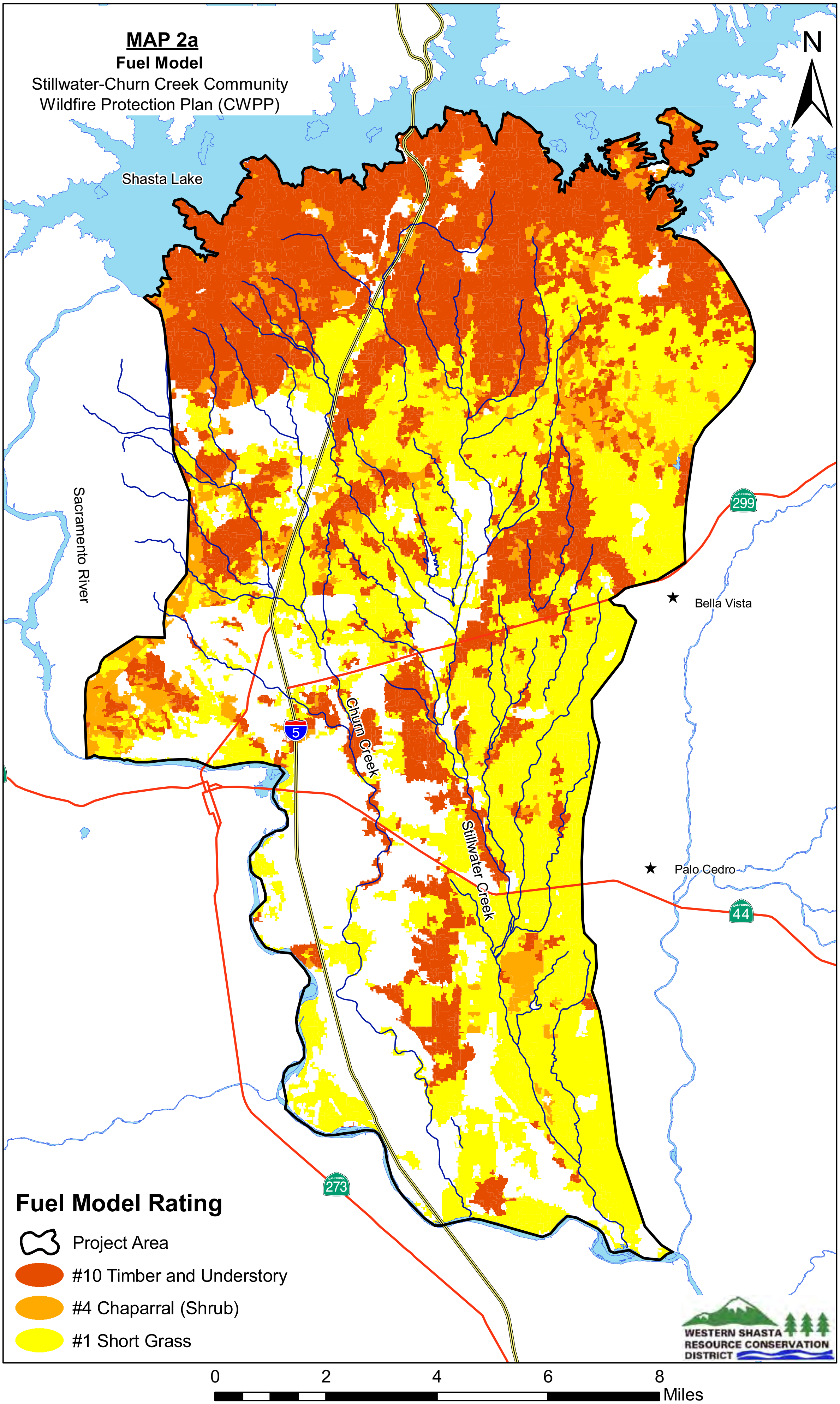
MAPS OF STILLWATER-CHURN CREEK PLANNING AREA

1. STILLWATER-CHURN CREEK PLANNING AREA
2. FIRE SEVERITY RATING
3. VEGETATION
4. SPECIAL STATUS SPECIES AND HABITAT

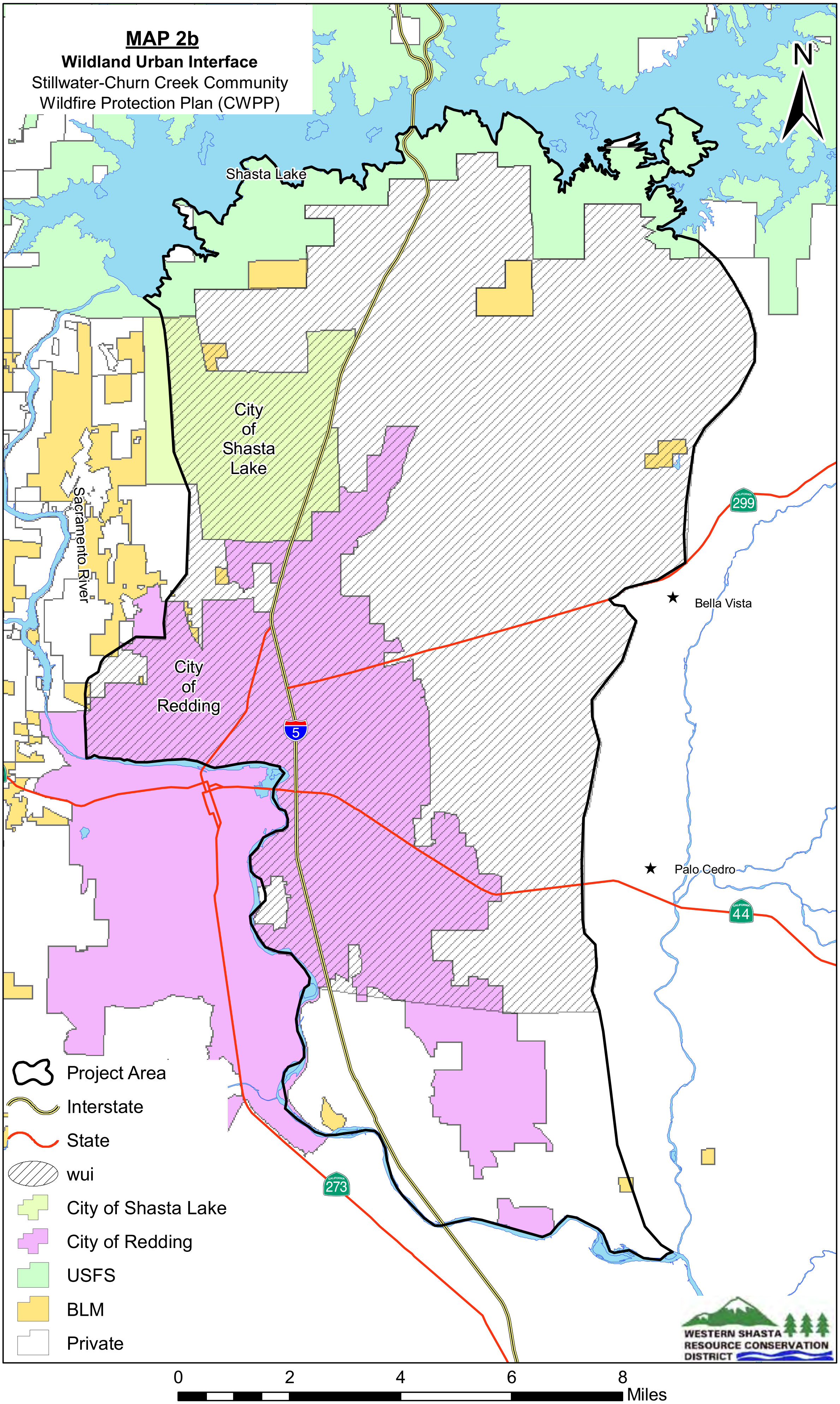
Stillwater/Churn Creek CWPP Fuels Projects

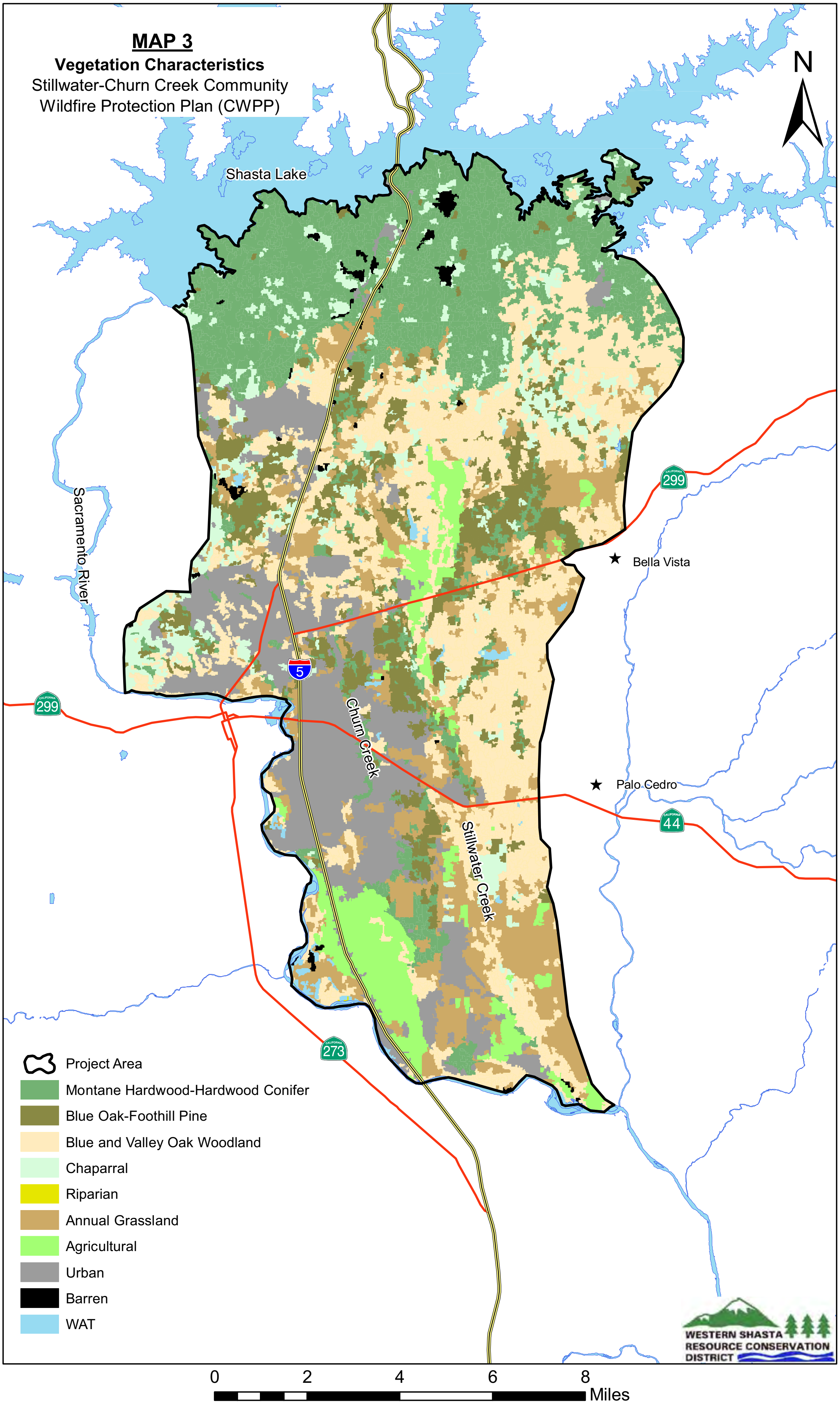


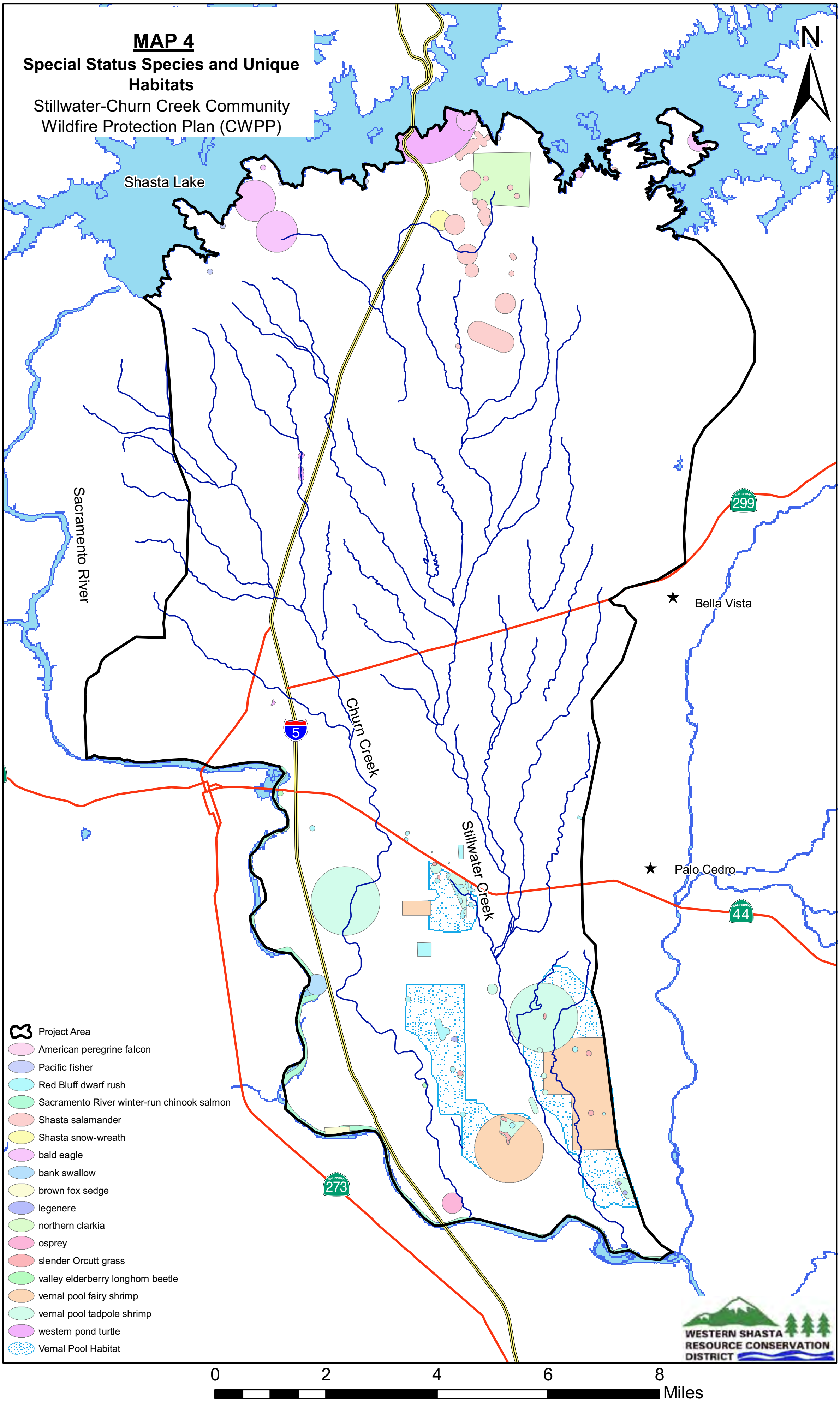
Priority	Project Name
1	North Shasta Lake City - Sect B East FB
2	North East Shasta Lake City FB
3	Fawndale Community FB
4	Elk Trail West FB
5	Dry Creek Rd FB
6	Old Oregon Trail North FB
7	Akrich FB
8	Pine Grove FB
9	Quartz Hill Rd/Benton FB
10	Quartz Hill Rd near River Ridge Dr.
11	Intermountain Rd FB
12	Highway 44 near Stillwater Rd FB
13	Creek Trl FB
14	Highway 299E near Shasta College
15	Keswick Dam Rd East FB
16	Centimudi FB


MAP 2a
Fuel Model
Stillwater-Churn Creek Community
Wildfire Protection Plan (CWPP)
N
Shasta Lake
Sacramento River
Bella Vista
Palo Cedro
299
44
273
5
Churn Creek
Stillwater Creek
Fuel Model Rating
Project Area
#10 Timber and Understory
#4 Chaparral (Shrub)
#1 Short Grass
WESTERN SHASTA
RESOURCE CONSERVATION
DISTRICT
0
2
4
6
8
Miles

MAP 2b
Wildland Urban Interface
Stillwater-Churn Creek Community Wildfire Protection Plan (CWPP)




MAP 3
Vegetation Characteristics
Stillwater-Churn Creek Community
Wildfire Protection Plan (CWPP)
N
Shasta Lake
Sacramento River
Churn Creek
Stillwater Creek
Bella Vista
Palo Cedro
299
5
299
44
273
Project Area
Montane Hardwood-Hardwood Conifer
Blue Oak-Foothill Pine
Blue and Valley Oak Woodland
Chaparral
Riparian
Annual Grassland
Agricultural
Urban
Barren
WAT
WESTERN SHASTA RESOURCE CONSERVATION DISTRICT
0
2
4
6
8
Miles


MAP 4
Special Status Species and Unique Habitats
Stillwater-Churn Creek Community Wildfire Protection Plan (CWPP)
N
Shasta Lake
Sacramento River
Churn Creek
Stillwater Creek
Bella Vista
Palo Cedro
299
5
44
273
Project Area
American peregrine falcon
Pacific fisher
Red Bluff dwarf rush
Sacramento River winter-run chinook salmon
Shasta salamander
Shasta snow-wreath
bald eagle
bank swallow
brown fox sedge
legenere
northern clarkia
osprey
slender Orcutt grass
valley elderberry longhorn beetle
vernal pool fairy shrimp
vernal pool tadpole shrimp
western pond turtle
Vernal Pool Habitat
WESTERN SHASTA RESOURCE CONSERVATION DISTRICT
0
2
4
6
8
Miles

APPENDICES

APPENDIX A: GLOSSARY

APPENDIX B: LIST OF ORGANIZATIONS & PROGRAMS

APPENDIX C: COMMUNITY FIRE SAFE FUEL REDUCTION GUIDELINES

APPENDIX A
GLOSSARY

BEHAVE – A computer program used for predicting fire behavior.

Chain – A unit of measurement equal to 66 feet.

Fuel Characteristics – Factors that make up fuels such as compactness, loading, horizontal continuity, vertical arrangement, chemical content, size and shape, and moisture content.

Fuel Chemical Content – Substances in the fuels which can either retard or increase the rate of combustion, such as mineral content, resins, oils, wax, or pitch.

Fuel Ladder – Fuels which provide vertical continuity between strata. Fire is able to carry from ground, to surface, to crown.

Fuel Moisture Content – The amount of water in a fuel, expressed as a percentage of the ovendry weight of that fuel.

Fuels – Any organic material, living or dead, in the ground, on the ground, or in the air, that will ignite and burn. General fuel groups are grass, brush, timber, and slash.

Mechanical Treatment – Using mechanized equipment including but not limited to bulldozers with or without brush rakes, rubber tired skidders, mechanized falling machines, chippers and grinders.

Pile and Burn – Material is cut and piled in open areas to be burned. Burning takes place under permitting environmental conditions.

Prescribed Burning – The burning of forest or range fuels on a specific area under predetermined conditions so that the fire is confined to that area to fulfill silviculture, wildlife management, sanitary or hazard reduction requirements, or otherwise achieve forestry or range objectives.

Rate of Speed – It is expressed as rate of forward spread of the fire front, usually is expressed as chains per hour.

Shaded Fuelbreak – A wide strip or block of land on which the vegetation has been modified by reducing the amount of fuel available, rearranging fuels so that they do not carry fire easily, and replacing particularly flammable fuels with others that ignite less easily and burn less intensely.

Surface Fire – A fire that burns surface litter, debris, and small vegetation.

Topography – The configuration of the earth's surface, including its relief and the position of its natural and manmade features.

APPENDIX B
LIST OF ORGANIZATIONS & PROGRAMS

BLM .... Bureau of Land Management
BOR .... Bureau of Reclamation
CAL FIRE .... California Department of Forestry & Fire Protection
Caltrans .... California Department of Transportation
CDFW .... California Department of Fish and Wildlife
CWPP .... Community Wildfire Protection Plan
FRAP .... (CAL FIRE) Fire and Resource Assessment Program
FPZ .... Forest Protection Zone
FS .... USDA Forest Service
FSC .... Fire Safe Council
NPS .... National Park Service
NRCS .... Natural Resources Conservation Service
RCD .... Resource Conservation District
RWQCB .... Regional Water Quality Control Board
SRA .... (CAL FIRE) State Responsibility Area
USDA .... United States Department of Agriculture
USDI .... United States Department of the Interior
WSRCD .... Western Shasta Resource Conservation District
WUI .... Wildland Urban Interface

APPENDIX C
COMMUNITY FIRE SAFE FUEL REDUCTION GUIDELINES

Why 100 Feet?

Following these simple steps can dramatically increase the chance of your home surviving a wildfire!

A **Defensible Space** of 100 feet around your home is required by law.[1] The goal is to protect your home while providing a safe area for firefighters.

1 "Lean, Clean and Green Zone."

– Clearing an area of 30 feet immediately surrounding your home is critical. This area requires the greatest reduction in flammable vegetation.

2 "Reduced Fuel Zone."

– The fuel reduction zone in the remaining 70 feet (or to property line) will depend on the steepness of your property and the vegetation.

Spacing between plants improves the chance of stopping a wildfire before it destroys your home. You have two options in this area:

- **a** Create horizontal and vertical spacing between plants. The amount of space will depend on how steep the slope is and the size of the plants.
- **b** Large trees do not have to be cut and removed as long as all of the plants beneath them are removed. This eliminates a vertical "fire ladder."

When clearing vegetation, use care when operating equipment such as lawnmowers. One small spark may start a fire; a string trimmer is much safer.

Remove all build – up of needles and leaves from your roof and gutters. Keep tree limbs trimmed at least 10 feet from any chimneys and remove dead limbs that hang over your home or garage. The law also requires a screen over your chimney outlet of not more than ½ inch mesh.

1. These regulations affect most of the grass, brush, and timber-covered private lands in the State. Some fire department jurisdictions may have additional requirements. Some activities may require permits for tree removal. Also, some activities may require special procedures for, 1) threatened and endangered species, 2) avoiding erosion, and 3) protection of water quality. Check with local officials if in doubt. Current regulations allow an insurance company to require additional clearance. The area to be treated does not extend beyond your property. The State Board of Forestry and Fire Protection has approved Guidelines to assist you in complying with the new law. Contact your local CDF office for more details.

April 2006

Here's How to Get Started: Create a Fire Safe Landscape in Seven Steps

Step One
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- The Department of Fish & Game should be notified and consulted if work occurs near a river, stream, lake, or tributaries. Go to: www.dfg.ca.gov/1600/1600.html
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Step Five
Implement the plan. Get help and any needed equipment. Begin work in the Home Ignition Zone and work out from there. Remember: It's the little things—such as patio furniture and cushions, leaves, needles, firewood piles, bark, etc.—that can ignite and cause a fire to your home.

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Remove all slash and debris generated during the fuel modification process by chipping, burning or disposal at your local vegetative waste site. Contact your local fire department for permit requirements. Contact your local Fire Safe Council about their chipping, home consultation and other programs. Find your local Fire Safe Council at www.FireSafeCouncil.org.

Step Seven
Continue to monitor and evaluate the fire safe condition of your home and landscape. Maintain your home's resistance to fire and the *defensible space* in the surrounding property on a routine basis—annually or more frequently, if needed. For new construction, consider fire resistant materials such as concrete panels, stone, brick or other material that doesn't burn easily.

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Special thanks to the Butte County Fire Safe Council

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Ignition: The point at which a fire starts as a result of fuel contacting with embers, firebrands (hot, flying embers), direct flame, or superheated air.

Topography: Primarily slope or the steepness of the incline on which your house is situated. Also your home's location on the slope and proximity to canyons or ravines.

Weather: Primarily wind, but also air temperature and humidity (moisture content of the air).

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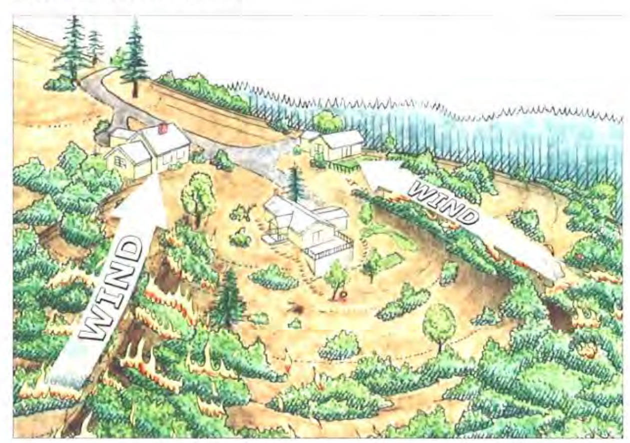

During the summer and fall months, a combination of low humidity, high temperatures and strong winds results in a "red flag" weather warning. During such a condition, the fire danger is very high. The X-Factor explained above helps provide that extra margin of *defensible space* necessary to keep your property fire safe.

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  California Fire Safe Council
- www.fire.ca.gov
  California Department of Forestry & Fire Protection; includes forest management information

California Fire Safe Council
P.O. Box 2106
Glendora, CA 91740
Phone: 626/335-7426
www.FireSafeCouncil.org

A Homeowner's Guide to Fire Safe Landscaping

Timberland

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Home Ignition Zone

(The home plus 10 ft distance)

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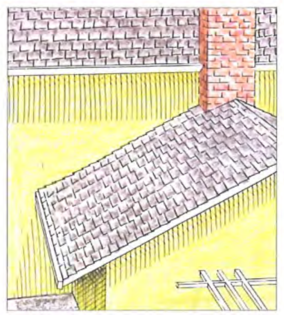
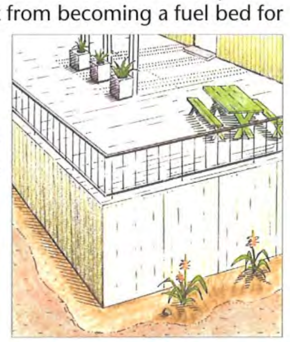
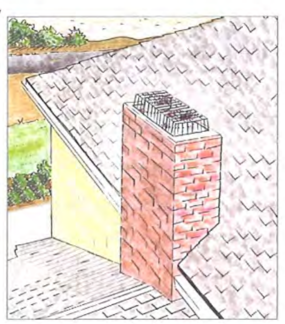


1. Keep your rain gutters and roof clean of all flammable material.
2. Get rid of dry grass, brush and other flammable materials around your home—and don't forget leaves, pine needles and bark walkways. Replace with well maintained (watered) landscape vegetation, green lawn and landscape rocks.
3. Clear all flammable materials from your deck. This includes brooms, stacked wood and easily ignitable patio furniture. Also enclose or board up the area under your deck to keep it from becoming a fuel bed for hot embers.



4. Move woodpiles and garbage cans away from your home. Keep woodpiles away from the home a distance of 2 times the height of the pile—more if lot size allows.
5. Use fine mesh metal screen (1/4" or less) to cover eaves, roof and foundation vents to prevent windblown embers from entering.



6. Inspect and clean your chimney every year. Trim away branches within 10 feet. Install a spark arrester with 1/2" or smaller mesh screen.
7. Got a propane tank? Get rid of any flammable materials within 10 feet of it and, if possible, position it at least 30 feet from any structures.
8. Window screens should be metal, not plastic or other flammable or meltable material.
9. If your home has a pet door, check its seal.

Burning embers landing on wood shake roofs are one of the leading risk factors for losing your home to a wildfire. If possible, replace wood shingle roofs with non-flammable (Class-A) roofing materials, such as asphalt shingles, tile or metal roofing.

Defensible Space Zone *(100 feet or more distance)* • Keep this area lean and green!

Your "*defensible space*" is the area that is a minimum of 100 feet from your home (as required under State Public Resources Code 4291 or other local ordinances). This is the area where you've modified the landscaping to allow your house to survive on its own—greatly improving the odds for firefighters defending your home.

If your home is on a slope or subject to high winds, extend the distance of this zone based upon the "**X-Factor.**" For instance, this zone may increase to 150 feet (1.5 X 100 feet).

Create a *Defensible Space Zone* by keeping in mind the three R's of defensible space:

- **Remove**—dead and dying grass, shrubs and trees.
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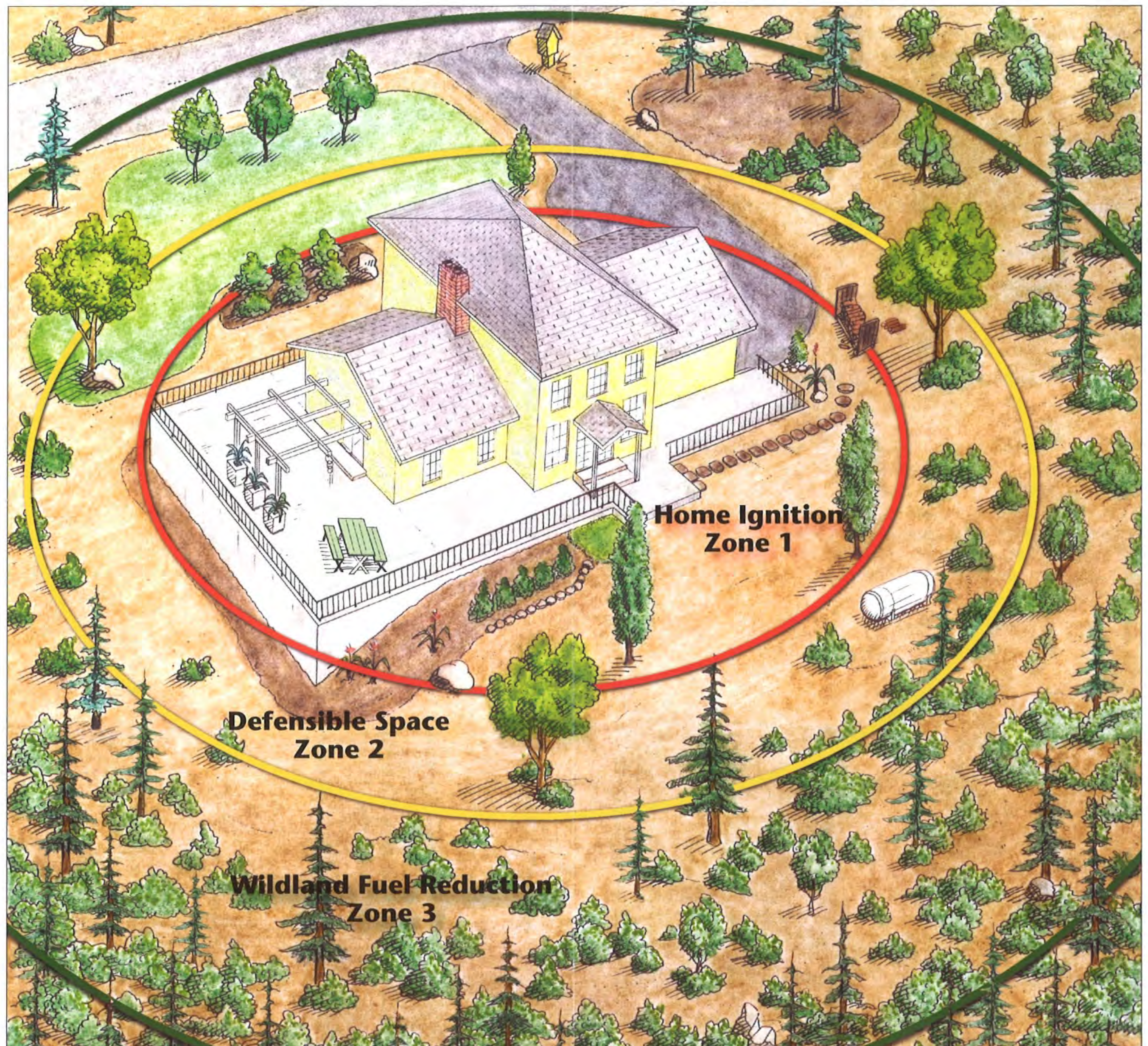


Find out more ways to make your home fire safe: www.FireSafeCouncil.org

Wildland Fuel Reduction Zone

(Beyond 100 feet distance)

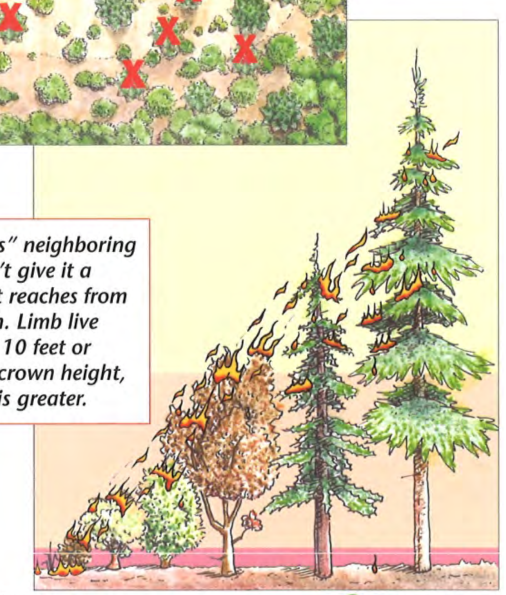
Getting rid of the undergrowth and thinning out densely-crowded smaller trees in this outlying area will reduce fire intensity and slow the spread of a fire moving toward your home. Defensible space increases the odds of your home's survival.

Experts recommend a minimum of 10 feet of spacing between individual trees and shrubs, measured at the crown (widest part) of the tree or shrub. You may need to increase this distance based on your property's **X-Factor**.

Mature trees should also be limbed up 10 feet, or 1/3 of their live crown height, whichever is greater.

It's possible, depending upon the size of your property, that you will be limited by your property boundary and unable to complete the fire safe measures identified in Zones 2 and 3. If this happens, talk with your neighbors and ask for their cooperation. A safer home means a safer neighborhood for everyone.

Reduce density by giving brush and shrubs more space—ideally they should be about 10 feet apart from one another.



Fire "climbs" neighboring trees—don't give it a ladder that reaches from low to high. Limb live trees up to 10 feet or 1/3 of live crown height, whichever is greater.

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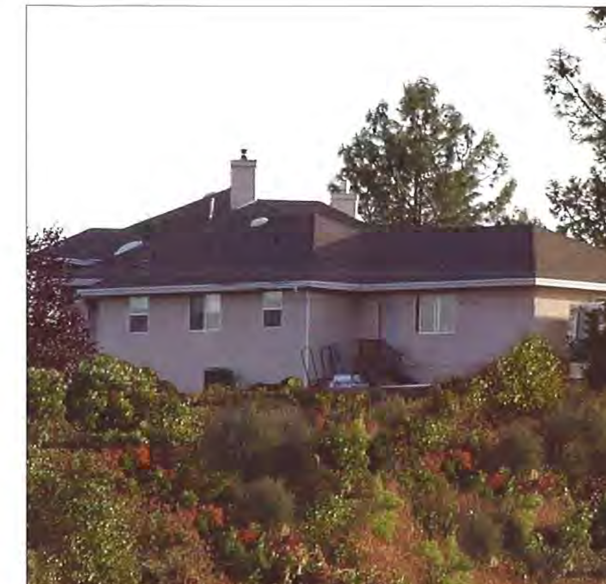

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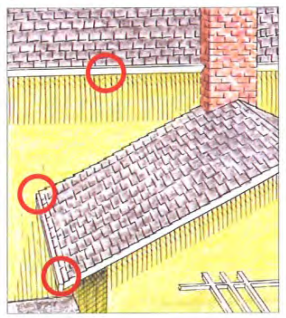

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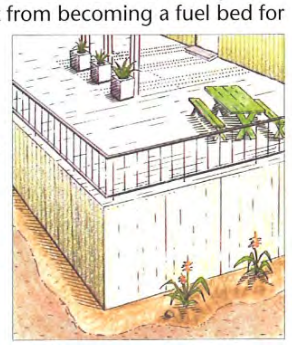

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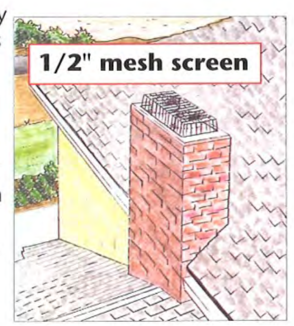

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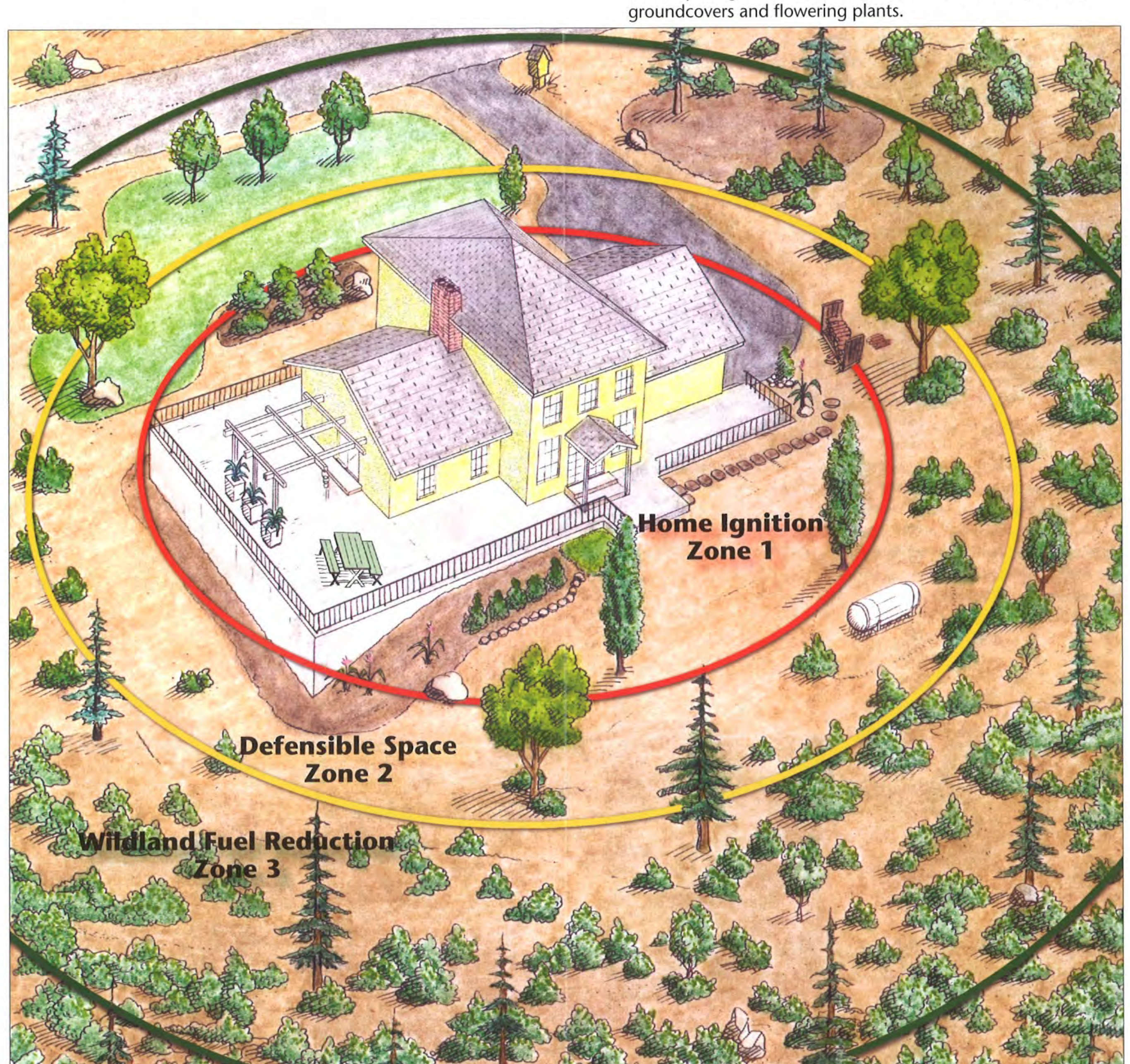

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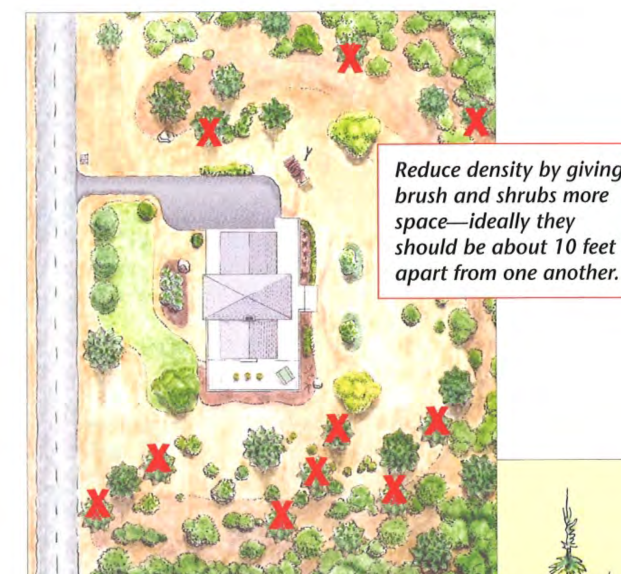

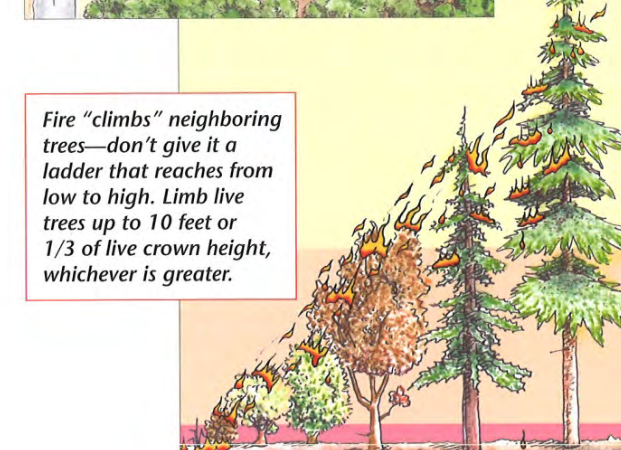

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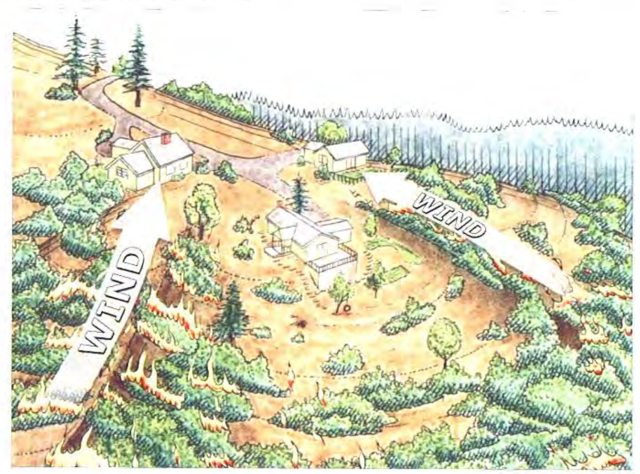

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April 2005

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FireSafe COUNCIL

Allstate
You're in good hands.

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A Homeowner's Guide to Fire Safe Landscaping

Grassland

The California Fire Safe Council's mission is to provide leadership and support that mobilizes all Californians to protect their homes, communities and environment from wildfire. We accomplish our mission through broad-based public/private partnerships that create community-wide change via education and action programs because we believe fire prevention and loss reduction are everyone's business.

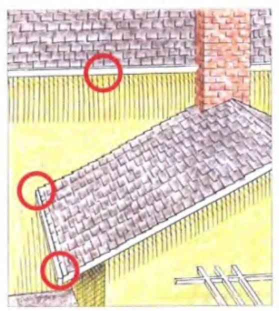
FireSafe COUNCIL

www.FireSafeCouncil.org

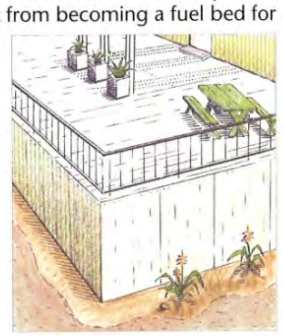
Home Ignition Zone

(The home plus 10 ft distance)

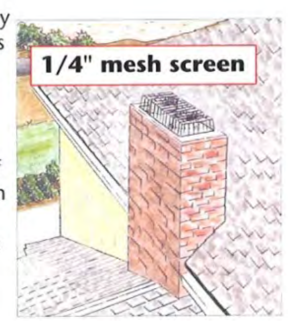
It's the 'little things' that will endanger your home. Just a little ember landing on a little pile of flammable material will burn it. Spend a morning searching out and getting rid of those flammable little things outside and your home will be much safer.



1. Keep your rain gutters and roof clean of all flammable material.
2. Get rid of dry grass, brush and other flammable materials around your home—and don't forget leaves, pine needles and bark walkways. Replace with well maintained (watered) landscape vegetation, green lawn and landscape rocks.
3. Clear all flammable materials from your deck. This includes brooms, stacked wood and easily ignitable patio furniture. Also enclose or board up the area under your deck to keep it from becoming a fuel bed for hot embers.



4. Move woodpiles and garbage cans away from your home. Keep woodpiles away from the home a distance of 2 times the height of the pile—more if lot size allows.
5. Use fine mesh metal screen (1/4" or less) to cover eaves, roof and foundation vents to prevent windblown embers from entering.
6. Inspect and clean your chimney every year. Trim away branches within 10 feet. Install a spark arrester with 1/4" or smaller mesh screen.



7. Got a propane tank? Get rid of any flammable materials within 10 feet of it and, if possible, position it at least 30 feet from any structures.
8. Window screens should be metal, not plastic or other flammable or meltable material.

Burning embers landing on wood shake roofs are one of the leading risk factors for losing your home to a wildfire. If possible, replace wood shingle roofs with non-flammable (Class-A) roofing materials, such as asphalt shingles, tile or metal roofing.

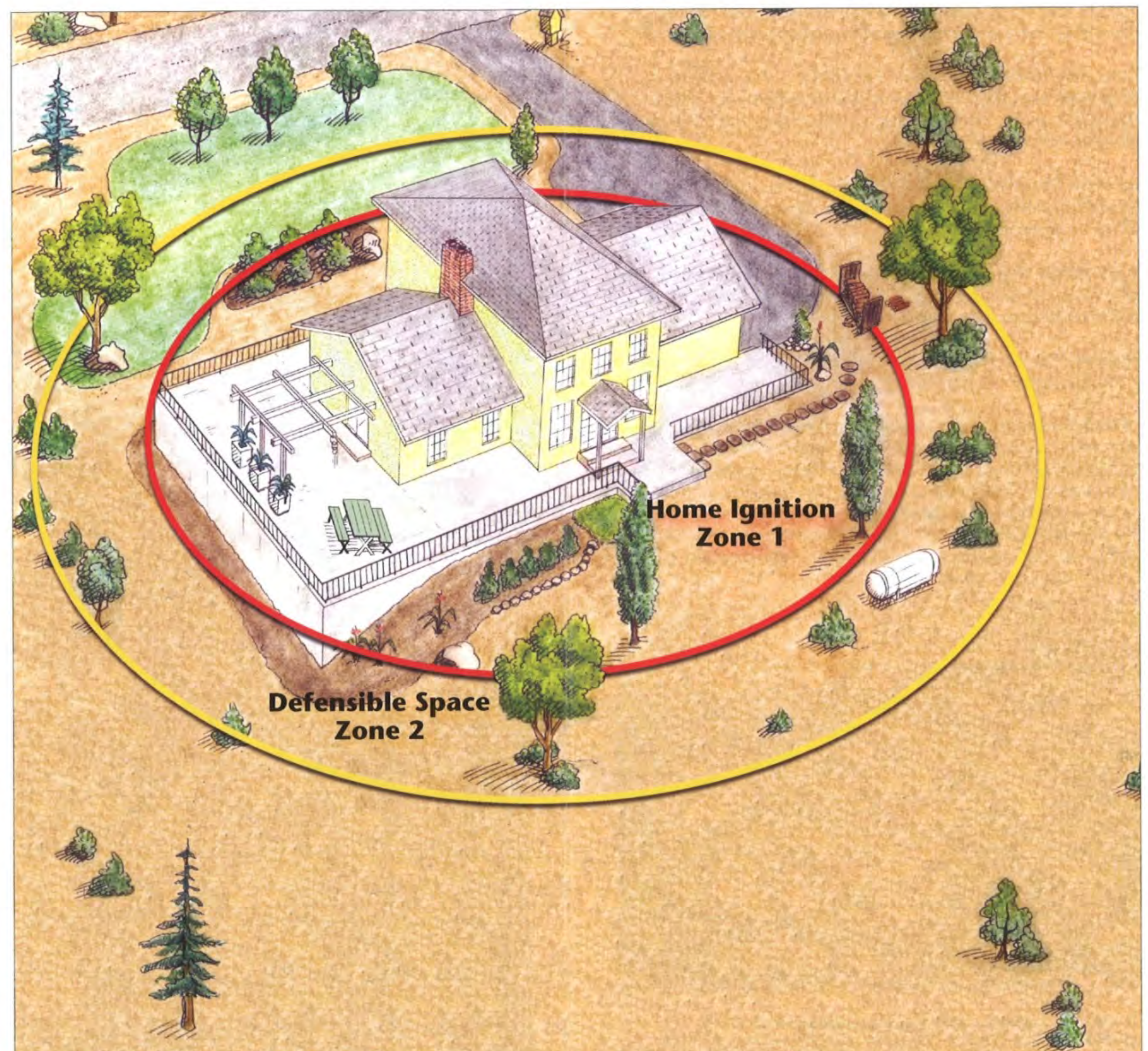
Defensible Space Zone (100 feet or more distance) • Keep this area lean and green!

Your "*defensible space*" is the area that is a minimum of 100 feet from your home (as required under State Public Resources Code 4291 or other local ordinances). This is the area where you've modified the landscaping to allow your house to survive on its own—greatly improving the odds for firefighters who are defending your home.

If your home is on a slope or subject to high winds, extend the distance of this zone based upon the "**X-Factor.**" For instance, this zone may increase, then, to 150 feet (1.5 X 100 feet).

Create a *Defensible Space Zone* by keeping in mind the three R's of defensible space:

- **Remove**—dead and dying grass, shrubs and trees.
- **Reduce**—the density of vegetation (fuel) and ladder fuels, those fuels extending from the ground to the tree canopies.
- **Replace**—hazardous vegetation with less flammable, irrigated landscape vegetation including lawn, or other low growing groundcovers and flowering plants.



Find out more ways to make your home fire safe: www.FireSafeCouncil.org

Are you doing the right thing—the wrong way?

Getting rid of the hazards around your home is a good idea—but you need to do it properly or you could accidentally start a wildland fire.

Each year fire departments respond to thousands of fires started by people using equipment the wrong way. Whether working to create defensible space around your home, just mowing dry grass, or pulling your dirt bike over to the side of the road, if you live in a wildland area you need to use all equipment responsibly. Lawnmowers, weedeaters, chainsaws, grinders, welders, tractors and trimmers can all spark a wildland fire. Do your part, the right way, to keep your community fire safe.

Here's how to do it the RIGHT WAY:

- Mow before 10 a.m. If it's too hot for you, it's too hot to mow. **REMEMBER, DON'T MOW DURING THE HEAT OF THE DAY OR WHEN THE WIND IS BLOWING!**
- **Beware**—Lawn mowers are designed to mow lawns, not dry grass, weeds or rocks! A grass-hidden rock is enough to start a fire when struck by a metal blade. Remove rocks from the area before you begin mowing.
- **In wildland areas**, spark arresters are required on all portable gasoline powered equipment. This includes tractors, harvesters, chainsaws, weedeaters and mowers.
- Keep the exhaust system, spark arresters and mower in proper working order and free of carbon buildup. Use the recommended grade of fuel and don't top off.
- **In wildland areas**, grinding and welding operations require a permit plus 10 feet of clearance, a 46-inch round point shovel, and a backpack watertype fire extinguisher—all ready to use.
- Hot exhaust pipes and mufflers can start fires you won't even see—until it's too late! Don't drive your vehicle onto dry grass or brush.
- Keep a cell phone nearby and call 911 **immediately** in case of fire.

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