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Telegraph Fire 2008
5. Midpines Community Features

5.1. Social and Political Setting

5.1.1. Cultural Resources

The Midpines area has, for generations, contained a substantial population of American Indians. The Yokut, Paiute, Miwok, Kesson and Chukchansi Peoples survived on the natural bounty that was provided by the Central California foothills’ soil. The contemporary members of these tribes have banded together, forming the Southern Sierra Miwok Nation. This cultural group currently strives to maintain language, identity, custom, and heritage along with forming an element essential in dealing with the various government agencies brought to the fore when California became a state in the United States of America.

The Southern Sierra Miwok have extensive spiritual, cultural and traditional ties to the land in Midpines. From the abundant local plant life, tribal members would gather not only food staples, but also plants and herbs used for medicinal purposes as well as the raw materials required for basketry. While useful plants are manifold, too numerous to mention here, the following represent some of the more prevalent and important of the flora gathered by the local tribes.

Food Staples

No plant was more important to the survival of the Indians of the greater Yosemite area than the Black Oak. Widespread burning by the Southern Sierra Miwok insured vast fields in which the black oak could thrive and bear that most important food staple, the acorn. This traditional food is still consumed today with the acorns, initially not safe for human consumption, prepared by drying them and ultimately leaching out their harmful tannic acid. Acorns keep extremely well when preserved correctly, so they have the historical benefit of being saved for lean times. In a similar manner, Buckeye was reported to be consumed by Southern Sierra Miwok, though at a lower priority as it contained higher levels of tannic acid than the trusty acorn. Wild Mushrooms are prevalent in the Midpines area and are sometimes collected as food by gatherers.

Medicinal and Traditional

The Southern Sierra Miwok collect a number of different herbs and plants to assist in maintaining their traditional heritage, and it is important that these plants are considered carefully should any change of land use occur. The majority of the usable flora can be found around the Red Willow, so stands of this tree in Midpines are areas of value and concern for the Southern Sierra Miwok. Indian tobacco grows throughout Midpines that is used for ceremonial smoking. Wormwood has valued cleansing properties, and parts of the elderberry are used for traditional ritual clapper sticks.

Basketry is an important element in the heritage of the Southern Sierra Miwok. The basket represents a longstanding historical tradition of taking to the hills and gathering the necessary materials to create useful and attractive utility baskets from the natural landscape. Contemporary basket making now represents some income, as the baskets can be made for sale. White root, Soap root, Redbud, and Willow are used in the actual weaving of the baskets, and they are stripped of their bark by the gatherers to get to the strips of useful core material, which has the excellent tensile strength required for basketry. Various roots and bracken fern can be located in Midpines to be used for dyeing certain sections of basket weaving material. This makes for the intricate designs that are seen on the sides of the baskets, and thus, these plants too should be considered valuable by local interests.
These plants are being gathered currently in various areas of the Midpines area and so any work, especially around stands of willow, should be done with the Southern Sierra Miwok interests in mind. These plants are gathered often by stripping or holding the bark in the teeth, so any widespread application of herbicide could have lasting effects on sensitive areas.

Animals also play a specific role in the culture of the Southern Sierra Miwok. Bears and Coyotes are considered totem animals for the associated tribes. Meaning, specifically, that the tribes share kinship with them and traditionally venerate them as their spiritual progenitors. Salmon also had an important place in the lives of the Southern Sierra Miwok tribes as their run had been as far up the mountain to the base of Vernal Fall in Yosemite Valley. With the development of the river, however, heavy human activity adversely affected the numbers of salmon, eventually leading to the end of the Salmon run at the Crocker Huffman Dam, just above Highway 59. These fish were collected as offerings to the bear totem as well as providing a valuable food source for earlier generations of Southern Sierra Miwok.

Areas of Interest

Currently the Southern Sierra Miwok have been designated several Bureau of Indian Affairs administered allotments in the Midpines area. These allotments provide federally protected land for specific families of the Southern Sierra Miwok nation and, in the case of the Hearns allotment, contain post-European contact cemeteries for burial of family members. Along with these federal allotments, the tribe maintains a 137-acre contiguous mining claim which is reserved for mixed usage including mining, and traditional ceremony.

Midpines is very archaeologically diverse, with some nineteen Indian village sites within its modern boundaries. These can be found along Saxon Creek, including Felician, Timber and Carstens Road as well as a documented village site just below the location of the old Acorn Inn located at the convergence of Triangle Road and Highway 140. Another village site can be found in the area directly behind the Midpines Store.

Midpines is also home to a number of traditional burial locations for the member tribes of the Southern Sierra Miwok Nation. The Saxon Creek and Jones Creek areas were popular locations to bury the dead. The tribes would traverse the lands between village sites and gathering areas using an extensive network of trails, with one of the most important running perpendicular to the Merced River and crossing near Briceburg.

Due to the sensitive nature and archaeological value of these areas, their direct locations of burial, village and trail sites cannot be revealed in this report. While any major work will require permitting that will be viewed by the Mariposa Indian Council, it would be to great advantage to check with the Council before any extensive work is considered.

The following historical report of the history of Midpines represents an area large both in size and in time. Spreading out from the slopes of Mt. Bullion to nearly the ridge of Felician, this area has long been the site of human activity. Members of what is now known as the Southern Sierra Miwok Tribe took what they needed from the land and later miners of European descent took what their burgeoning industrial society needed from that same earth. Both of these groups of people maintained a close and special relationship to the area.

Fire has played an important role in Midpines as well. As the shock of the 2008, Telegraph Fire has slowly worn away, it is important to remember that fire and fire suppression have long been in use and consideration in the area. The American Indians would use it to clear patches of land so that their valuable plants could grow more freely, and, later, European-descended immigrants would do the same, as well as actively suppressing unintentional fire. It is the author’s sincere hope that anyone interested in embarking on any fire prevention work that might in any way alter the landscape, consider carefully the history below, present in a site by site basis, so that no elements of our shared past are lost to posterity.
Way Stations and Inns

At first, before White Americans came across the Yosemite Valley, the majority of Inns were catering to exhausted miners who required a place to rest after a hard day's travel or work. The communities of Sherlock and Whitlock both had places to provide this function in the years surrounding the mid nineteenth-century. Ultimately, as mining production wound down, the area would require inns and way stations that catered to a different kind of patron, the Yosemite tourist. The short list that follows represents this need.

Acorn Inn

Located at the junction of Highway 140 and Triangle Road. This tourist resort would begin as the brainchild of Fred Clark Sr. who broke ground just before the building of the all year SH140, or State Highway 140, in 1926. Though it has not functioned as a tourism venue for many years, the original main hall still stands.

The Midpines Resort

Established in the early 1920’s when Newell Chamberlain built camp Midpines on a 171 acre parcel he had recently purchased. This camp quickly became a tourist resort when California established all year highway 140 to Yosemite in 1926. Soon a Post Office was placed there and Midpines became the official name of the township, with Newell serving as its first postmaster.

The Summit Inn

Located on SH140 at the Midpines Summit. Another of the tourism operations related to the 1926 opening of all year SH140. Opened by the Millburn family, the remains of this operation were torn down because of the Midpines Summit Highway widening project.

The Midpines Store

Opening with the other tourism applications around SH140’s 1926 completion by the Carstens family. This store, located at the intersection of Carstens Road and SH140 still remains an economically viable operation.

Mining

The Story of Midpines cannot be separated from the story of mining. Existing outside the boundaries of John C. Fremont's famous floating land grant, the area consisting of the Sherlock, Whitlock and Western Feliciana mining districts, was a veritable free-for-all for mining claims and remained that way well into the twentieth century.

Described by a local historian as an area of "quieter," or "unrecorded" development, by the late 1850's, the area we now call Midpines was being populated at a very swift rate. While there were occasionally miners taking advantage of easily reachable placer deposits or gold that was obtainable by merely washing or panning, the majority of claims were for hard rock or quartz mining. Quartz mining was difficult and required the use of technology to make it feasible. Stamp mills, with the first in the state likely located at Fremont’s Mariposa Mine, bore the brunt of the work, smashing ore that miners had extracted from the area just east of the famous Mother Lode. These mills required lumber, and saw mills to make the lumber, and men to work the sawmills, and food to feed the men, and so on ad-infinitum. In this manner, mining drove the economy, populating and providing for the surrounding communities.
The following represents an incomplete list of the mines in the greater Midpines area. The ones chosen for inclusion benefit from a good paper trail and easily accessible information. Anyone interested in finding more sites of mining operations should be directed to *A Map of Mariposa County California Showing Mines and Prospects*. This map was published by the State of California Department of Natural Resources, Division of Mines, in 1957, and is available for purchase at the Mariposa County History Center. Another excellent list is provided on the website *Ghost Town USA's Guide to the Ghost Towns, Mining Camps and Other Formerly Inhabited Places in Mariposa, California*, by Gary B. Speck publications.

**Alabama Mine**
Located next to the Whitlock Mining operation approximately four and one-half miles from the town of Mt Bullion. This claim was eventually consolidated with those of the Whitlock Mining Operation and the Westward Mine.\(^{12}\)

**Buena Vista Mine**
This group mining operation includes the Ruech and Washington-Buena Vista Mines. It is located just south of the Sherlock and Telegraph Road intersection on Sherlock Road. This mine contained one of the first quartz mills built in 1851.\(^{13}\)

**Buffalo Mine**
Located approximately one mile from the confluence of Trabucco Creek and Bear creek and SH 140.

**Colorado Quartz Mine**
Located on the headwaters of Saxon Creek on Long Gulch, this hard rock lode mine had a ten stamp mill and was operated continuously until its closure in the 1940s.\(^{14}\)

**The Diltz Mine**
Thanks to John S. Diltz's autobiography, much is known about the founding and early operation of what was to be known as the Diltz Mine. Born in Illinois a sickly child, John Diltz cut his mining teeth in the Georgia gold mines around 1842.\(^{15}\) Later he found his way to Mariposa during the gold rush and eventually, by 1857, would end up working off the vein previously exploited by the southerly Whitlock Mine.\(^{16}\)

The mine Diltz founded was continuously worked for more than a century rewarding its owners handsomely. In the 1930s, it yielded a specimen weighing in at fifty-two pounds, fetching a price of over ten thousand dollars!\(^{17}\)

**Farmer's Hope Mine**
This mine was located somewhere very near to the town of Whitlock as it was described as such in the *Mining Bureau* publication.\(^{18}\)

**The Golden Key Group**
This Hard Rock Mining operation was to be found just over one mile west of the Sherlock and W, Whitlock Road junction. It was last worked in 1949.\(^{19}\)
The Nutmeg Mine

The remains of the mine are to be found on Nutmeg Road, which branches off of Mosher Rd., about three-quarters of a mile from the confluence of Sherlock Creek and W. Whitlock Road.

Schroeder Mine

This mine was discovered in 1878 by John Schroeder. The mine itself had rather unique beginnings due to the fact that the initial patent Schroeder applied for was for placer diggings in an area that was mined mostly for lode gold. Eventually Mr. Schroeder harnessed the power of water for hydraulic mining by digging a ditch some two and one-half miles to nearby Saxon Creek. This feat of engineering was made all the more amazing by noting that the ditch only rose one inch to the rod.

Later the Schroeder operation consolidated with the Rex Mining operation and remained active until 1949.\(^{20}\) The mining operation had a large stamp mill that remained in operational condition until it was burned in the Telegraph Fire of 2008.

The Whitlock Group Mining Operation

Located in the Whitlock mining district near the town of Whitlock about six miles from the town of Mariposa. This operation, originally simply labeled the Whitlock Mine, was originally scouted out by the man after whom everything in the area is named, Thomas J. Whitlock. According to Lafayette H. Bunnell, in the years following the Yosemite conflict of 1851, Whitlock and his men had been mining the area around the head of Sherlock Creek. Not finding any heavy strikes, the men headed in a southerly direction until they reached what is now Whitlock Creek. There, in the gulch, they found a rich lode deposit on a vein that now bears the name of its founder, the Whitlock vein.\(^{21}\)

By 1921, according to the Seventeenth Report of the State Mineralogist, the operation was composed of three patented claims, the Whitlock, Alabama and Westward claims, making for a very busy mine.\(^{22}\) This operation remained profitable with its last known haul being a respectable $500,000 in 1948.\(^{23}\)

Mining Camps and Towns

Bear Creek

This Mining camp is located along Bear Creek about three miles northeast of the town of Mariposa. A letter from this camp written by a man named Allsop was datelined September 14, 1852, making this an area of known settlement.\(^{24}\)

Bonnet Garden

A mining camp located along the Mariposa Creek 1.2 miles south of the town of Whitlock, now 1.5 miles north of the E. Whitlock and SH49 Junction.\(^{25}\)

Colorado

Located at the headwaters of Saxon Creek, Colorado was an area of intense action due to the bustle of mining activity that accompanied the gold rush. Called often by the name “Colorow,” the place name was thought to be derived from a native corruption of the Spanish word “rojo,” meaning red.\(^{26}\) It is known from the letters of Allsop that the area was “a very rich spot” as early as January of 1852.\(^ {27}\) A business directory from 1867 shows that this ramshackle mining camp had quickly become a town, with several stores, two saloons, a livery stable and a blacksmith.\(^ {28}\) At the height of its activity, a post office serviced the area from 1858-1860.\(^ {29}\)
**Drunken Gulch**

With mining beginning in this area around 1854, a small camp developed on the Eastern slope of Mt. Bullion about one mile above the confluence of Sherlock Creek and the Merced River.  

**French Camp**

Located at the headwaters of Mariposa Creek, nearly four miles northwest of the town of Mariposa. This camp was known to be in existence as early as 1861, due to its inclusion on the Las Mariposas map of that year.

**Mono Camp**

A mining camp three miles north of Mariposa and less than two miles southeast of Colorado.

**Sherlock Town**

Located deep in the Sherlock Gulch. With gold discovered in the area as early as 1849, rampant mining activity in the Sherlock Diggings, located activity would require an area of sustained settlement to keep up with the extraction of ore. The initial discovery of gold in the area, as recounted by one Daniel Woods, was made by two brothers Sherlock, who were promptly chased out of the area by miners and speculators after uncovering a find of nearly thirty-thousand dollars. Eventually ballooning in size, the town eventually acquired an Odd Fellows Hall, a schoolhouse, a hotel and a bakery. While being a site of rich archaeological promise and historical heritage, there are no remaining structures from this settlement.

**Whiskey Flat**

This Hard Rock mining camp is known due to the publishing of a store advertisement in the April 7th 1854 edition of the Mariposa Chronicle, the Gazette’s precursor. Let it be known that this camp, located about two miles north of Whitlock almost on Sherlock creek, had a store to be found under the sign of a ground hog.

**Whitlock**

As mentioned before, this mining area and town was founded by Thomas J. Whitlock as he drifted south from the “dried up” hard rock mining areas near the head of Sherlock Creek. Easily mined placer diggings were found on this section of what was eventually called Whitlock Creek, and a new vein of gold bearing quartz was exploited. According to the state register of 1859, in this camp area alone, there were three mills with twenty-six stamps in total operating. By 1963, according to the Annual Mining Review, a twelve stamp mill had been erected on the site. All this mining naturally led to the building of more permanent dwellings.

Located about three and one-half miles to the northwest of Mariposa along W. Whitlock Road in the Whitlock Gulch, the town of Whitlock had a number of permanent domiciles, a school, and a post office that operated from 1899 to 1910, further proving the importance of the town.

**Homes**

**Schroeder Homestead**

Located about one-half mile north on Sherlock Road from its intersection with Colorado Rd. The oldest surviving structure on the Schroeder homestead is a cabin built by miner and pioneer John Schroeder in 1868. This building survives to this day, along with another cabin on the property, built in 1903, due to the efforts of the Schroeder descendants. This includes the current occupant, John, the first
Schroeder’s great-grandson. The original 120 acres of this property was eventually owned outright under the Homestead Act in 1912 and is now a model for fire prevention measures.38

**Clark Home and Sawmill**

The home is to be found on the west side of SH140 where it intersects with Triangle Road and the millpond can be found across the street behind the old Acorn Inn on Triangle Road. Vermont Immigrant David Clark built the house in 1851 and the mill soon followed. Though boarded up, the house remains and it was often used as a rented residence after the closure of the Clark owned Acorn Inn.39

5.1.2. Population and Demographics

The population of Midpines according to the US Census Bureau is approximately 1150.40 There are 2.4 people per household in Midpines that live in approximately 840 single-family owner occupied homes.

**Demographics:**

The current demographics: (Bureau of Census region)

- White population: 89.51%
- Black population: 0.62%
- Hispanic population: 7.47%
- Asian population: 0.67%
- Hawaiian population: 0.14%
- Indian population: 3.07%
- Other population: 2.39%

The median income for a Midpines household is $37,030.00 (2007) compared to the rest of California which shows an average of $49,854.00.41 The average business in Midpines pays an average yearly salary of $24,334.49 and the average number of employees per business is 8.6.

5.1.3. Community Legal Structure and Jurisdictional Boundaries

Midpines is within Mariposa County, which governs the Community. There is currently a Town Planning Advisory Group that is developing a town plan. There are no local CC&R’s or homeowner associations in the Midpines planning area.

Laws governing natural resources (including forested landscapes, soils, water courses, air quality, view sheds, and wildlife) are in the Code of Federal Regulations (CFR), Public Resources Code (PRC), and the California Code of Regulations (CCR). The Z’berg-Nejedly Forest Practice Act of 1973 (FPA) is contained in PRC §4511. Forestry Boards in California develop district-specific Forest Practice Rules (FPRs) to protect public resources on non-federal lands in California. These laws apply to forests containing species with commercial value, generally defined as all conifers. Any property owner must comply with the FPA and FPRs to sell, trade or barter any wood from conifers. Compliance requires the property owner to obtain a timber harvesting plan (THP) prepared by a Registered Professional Forester (RPF) and submitted to CAL FIRE for review and approval, and to also secure a timber harvest permit, that demonstrates CEQA compliance.

CAL FIRE has mapped the state’s fire hazard severity zones, identifying land where a Very High Fire Hazard Severity is present. This work was done under authorities defined in PRC §4102 and GC 51175. Midpines is classified as in a Very High Fire Hazard Severity Zone.
All structures in mountainous or forest-covered land, no matter what fire hazard severity zone, are required to comply with provisions of PRC §4291. CAL FIRE implements and enforces these laws. USDOI-BLM has jurisdiction over any mining on Private, State, or Federal lands.

5.1.4. Infrastructure

Saxon Creek MPUD pumping station, an underground pipeline that extends from the Merced River to the Stockton Creek Reservoir. 1,000,000 gal capacity water storage that can be accessed to support a wildland fire. This pipeline is a source of drinking water for the town of Mariposa.

Midpines County Park, this is also the location of the Community Center and the Midpines Fire Station.

Midpines roads & bridges

State Highway 140- paved two lane highway and is a major route to Yosemite National Park

Primary access roads include Colorado Road paved and dirt, Oak Road (paved), Whitlock Road(paved), East Whitlock Rd(dirt and paved), Grosjean Rd (paved), Carstens Drive(dirt), Ponderosa Way (paved and dirt), Buffalo Gulch Road (dirt and barely if not impassable to type 3 engines).

There are bridges crossing Bear Creek on Colorado and Oak Roads as well as Highway 140.

Utilities

PG&E poles, lines & equipment: A this major transmission line bisects the planning and provides power to Yosemite National Park. 35 KV lines service Midpines’ homes and businesses.

Sierra Telephone lines & equipment; the phone lines are underground and are not considered vulnerable to wildland fire. They have equipment in cinder block sheds that have propane tanks located next to them that are vulnerable to fire.

Northland Cable lines & equipment. The lines are attached to PG&E utility poles

Cell phone towers. There are two cell phone towers in the Midpines area. Cell phone communication is not reliable due to the topography.

Other

The closest hospital and schools are in Mariposa, outside of this planning area.

Estimated Value of Infrastructure & Facilities: $44.7 million

5.2. Public, Tribal, and Industrial Lands Fire Management

5.2.1. Public Lands

USDA Forest Service: Sierra National Forest

The Sierra National Forest borders the east side of the Midpines planning area for approximately 3,200 acres and is part of the Bass Lake District. Much of this property is prime timber producing country. There has been some mining on the National Forest, cattle grazing has not occurred since the mid 1980’s. Recreational uses have been off highway vehicle riding, horseback riding, and hunting. The Sierra National Forest Fire Management Plan does not specifically mention Midpines but its general policy is to suppress all wildland fires in less than ten acres by 10:00 AM the following day after a fire starts. Their fuels and silviculture departments are aggressively mitigating the hazardous fuels build up and have treated approximately 1500 acres with an additional 450 acres to be

Mastication on Feliciana Mtn
done within the next five years. Treatments so far have been mastication of tree plantations and fuel breaks. In the near future, several prescribed fires will be done to augment the mastication. The Forest Service currently funds the Mariposa County Fire Safe Council’s Defensible Space Grants to create defensible space for local residents who cannot afford to meet compliance on their own. The Forest Service also plans on funding fuel breaks to be constructed on Buckingham Mountain and Ponderosa Way.

**USDI Bureau of Land Management: Folsom District**

The Bureau of Land Management is interspersed with private holdings that are approximately 11,280 acres of the Midpines planning area. The BLM lands are administered by the Folsom District. The BLM Merced River Fire Management Unit, CA-180-13, covers the Midpines planning area. BLM contracts initial attack on fires to CAL FIRE. Highlights of its plan are to limit all fires, prescribed or wild, to 500 acres per decade. They also specify that 90% of wildland fires are to be suppressed at 10 acres at a 90% success rate. For hazardous fuel reduction in this planning area the BLM is not going to: be conducted in wilderness areas or proposed wilderness areas, will not include the use of herbicides, not include the construction of roads or other infrastructure, will not sell vegetative material with the intent being to reduce fuel loading, will not exceed 1,000 acres for mechanical fuel load reduction or 4,500 acres for prescribed fires. Fuel reduction projects will only be conducted in wildland-urban interface or in Condition Class 2 or 3 in Fire Regime Groups I, II, or III outside of the wildland-urban interface. Currently the BLM is funding the construction of the Feliciana Fuel Break to be completed in 2011.

**California State Lands**

The state of California has no lands within this planning area. CAL FIRE does list Midpines in its 2010 fire plan under Battalion 2. Proposed projects include: Colorado Road Fuel Break, a Mariposa Fire Safe Council Project and is a 300 foot wide shaded fuel break along Colorado Road between Hwy. 140 and Whitlock Road. Treatment types will include mechanical mastication, hand brushing and tree limbing. Fuels reduction to be accomplished through the use of mechanized equipment, hand crews and wintertime pile burning. This project will protect residents along Colorado Road, Rancheria Creek Road and Davis Road. Awaiting a funding source. Midpines / Mt. Bullion Fuel Break; this is a 400-500 acre proposed shaded fuel break to follow a path of ridge tops and established fire line from Midpines to Mt. Bullion. Will use fire control and contingency fire lines used during the Telegraph Fire that were strategically appropriate. Treatment types will include mechanical mastication, hand brushing and tree limbing. Fuels reduction to be accomplished through the use of mechanized equipment, hand crews and wintertime pile burning. Midpines Interior Strategic Fuel Reduction Project: this is a proposed fuels reduction project bounded by Colorado Road, Runley Mine Road, Telegraph Road, Sherlock Road, East Whitlock Road, and Highway 140. Treatment types will include mechanical mastication, hand brushing and tree limbing. Fuels reduction is to be accomplished with mechanized equipment, hand crews and wintertime pile burning; Using California Forest Improvement Project (CFIP) funding on parcels meeting requirements and using of Fuel Hazard Reduction Emergency funding on parcels meeting requirements. Projects that have been accomplished include: Vanderau VMP that was a fuels reduction project on 180 acres of a 429-acre parcel located northeast of Mariposa adjacent to the Stockton Creek Watershed area. This area had a high dead to live fuel ratio present due to chemical treatment from property owner. Fuels reduction completed through mechanized equipment, crew brush clearance and pile burning. Wood for Seniors Program established. The Long VMP which is a 4,000-acre ranch southwest of Mariposa adjacent to the Stockton Creek Drainage. Several VMP burns have been conducted over the years with the last one in 2004.
Mariposa County

Mariposa County owns 312 acres of undeveloped timber and brush land. The determination of use for this property is being developed as of this writing.

5.2.2. Tribal Lands

The Sarah Priest allotment belongs to members of the Sierra Miwok. This allotment is approximately 160 acres and there is no fire management plan for this property.

5.3 Community Planning Context

Currently there is not a General Plan for Midpines. An advisory group is in the process of developing a General Plan working with the Mariposa County Public Works, Planning Department.

5.3.1 Land Use Goals and Objectives

Currently in the Midpines Planning area, the land use comprises of single-family dwellings, some ranching, with small businesses. Growth has been slow with parcel sizes limited to no less than 5 acres. Attempts to develop high-density neighborhoods have not been successful for many years. There is an inadequate water supply to suppress large-scale wildland fires a factor which has been historically problematic. There are no plans scheduled to improve the road system within the planning area. Any new construction will have to comply with county building codes and comply with California Public Resource Codes.

5.4 Community Infrastructure to Address and Implement Objectives

There is currently an ad hoc Vegetation Management Committee, to advise the Midpines Town Planning Advisory Group. There is the Davis Road Group which gets together to brush Davis Road. There is not a Fire Safe Committee in Midpines.

This CCWPP can be incorporated into a town plan and will serve as a CCWPP should Midpines decide to form a Fire Safe Committee, The Mariposa County Fire Safe Council can act as a fiscal sponsor should a Midpines FSC decide to apply for grants. Further, the information contained in this plan could be used, in part, in the development of a watershed plan, or a FEMA plan.

2 The following information was ascertained in an interview with Southern Sierra Miwok tribal chairman, Tony Brochini on August 5th, 2009.
3 This information is from a conversation with Southern Sierra Miwok tribal elder, Della Hearn on August 8th, 2009
5 From a Conversation with Leroy Radanovich on Oct. 2nd, 2008.
7 From a Conversation with Leroy Radanovich on Oct 2nd, 2008.
8 For a detailed description of how Fremont procured this land see Chamberlain, Call of Gold, 13.


13 Gudde, *California Gold Camps*, 78.


15 Chamberlain, *Call of Gold*, 93.

16 Ibid., 97.


19 Sargent, *Seven Tours*, 35.

20 From *Ghost Town USA’s Guide to the Ghost Towns, Mining Camps and Other Formerly Inhabited Places in Mariposa, California*, by Gary B. Speck publications. <http://freepages.history.rootsweb.ancestry.com/~gtusa/ca/mrp-co/s.htm>

21 Chamberlain, *Call of Gold*, 47.


24 Ibid., 29.


26 Sargent, *Seven Tours*, 34.

27 Gudde, *California Gold Camps*, 78.


29 From a Database of Mariposa County Post offices, compiled by Phillips, Tom on the Mariposa Historical Directories, <http://www.mariposaresearch.net/postoffices.html>.


31 Ibid., 123.

32 Ibid., 221.

33 Ibid., 316.

34 Sargent, *Seven Tours*, 34-35.


36 Chamberlain, *Call of Gold*, 47.


38 From a Conversation with John Schroeder on Oct 2nd, 2009.


40 Estimate for 2007 provided by the US Census Bureau


42 <http://www.census.gov/hhes/www/income/income07/statemhi2.xls>
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6. Fire Protection Organizations

In Midpines, there is one local fire department:

Mariposa County Fire (MCF)

There are also a number of governmental fire agencies including:

- California Department of Forestry and Fire Protection, MMU Unit, CAL FIRE
- US Forest Service, Sierra National Forest
- US Bureau of Land Management, Folsom District

Fire Response

Quick suppression of a wildland fire is critical. The following response times given are considering that these are local resources with knowledge of the area, experienced drivers, weather and road conditions are not adverse.

**Nearest Fire Station** The Midpines Volunteer Fire Station (MCF): One Type 2 Engine (1,250 GPM pump, 750 gal), One Type 1 Water Tender (750 GPM pump, 3,800 gal), One Type 4 Patrol (100 GPM pump, 300 gal)

USDA Forest Service, Sierra National Forest: one type 3 engine and one type 4 patrol:

**Estimated Response Times**

From Midpines:
- 24 Minutes to the intersection of Whitlock and Mosher Roads
- 20 Minutes to the intersection of Whitlock and Sherlock Roads
- 15 Minutes to the intersection of Whitlock and Colorado Roads
- 3 Minutes to the intersection of Colorado Road and State Highway 140
- 9 Minutes to the intersection of Colorado Road and Davis Road
- 14 Minutes to the intersection of Colorado Road and Sherlock Road

**Next Fire Station**

From CAL FIRE, Headquarters:
- 15 Minutes to the intersection of Whitlock and Mosher Roads
- 19 Minutes to the intersection of Whitlock and Sherlock Roads
- 16 Minutes to the intersection of Whitlock and Colorado Roads
- 15 Minutes to the intersection of Colorado Road and Highway 140
- 21 Minutes to the intersection of Colorado Road and Davis Road
- 27 Minutes to the intersection of Colorado Road and Sherlock Road

**Response Resources**

Two Type 3 engines, 1 Dozer

In order to ensure that fire agencies operate in an efficient and cost-effective manner, "mutual aid" and "auto aid" agreements can be established. Mutual aid means that a fire department can request the services of another nearby fire department based upon predetermined agreements to provide such services. Mutual aid agreements exist among the major governmental agencies for back-up in large or multiple-fire scenarios and for general emergencies (CAL FIRE, USDA Forest Service (Sierra NF), USDOI Park Service (Yosemite National Park), and Mariposa County Fire). Auto aid means that the parties of an auto aid agreement will be dispatched to respond to incidents outside their regular district or jurisdiction to assist with suppression or other emergencies. These agencies are the only entities that have an auto aid agreement (with each other). This means that they are all automatically dispatched at the same time.

The following map shows local response area (LRA) boundaries (as defined by CAL FIRE), State (SRA), and Federal Response Areas (FRA). CAL FIRE is primarily responsible for wildlands in the
SRA as well as structure fires that threaten wildlands. The USDA Forest Service is responsible for wildlands in the FRA.

*Figure 1. Midpines Local, State, and Federal Responsibility Area Map*
6.1. Local Fire Agencies

Figure 2. Midpines Response Area

Mariposa County Fire Department

The Mariposa County Fire provides first-response fire and medical service to approximately 1150 residents in the Midpines Response Area.

Eleven local residents currently volunteer with Mariposa County Fire Department, approximately six of which are "active" firefighters. None are paid. The Mariposa County Fire Department has identified a need for more volunteers. The Mariposa County Fire Department is funded primarily through Mariposa County general funds and donations through fund raising events, totaling approximately $1.1 million annually. It also has an additional $11 million dollars from various FEMA grants they are using for capital improvements to existing stations and to construct four new stations. Mariposa County Fire Department has 13 fire stations located in Mariposa County. This includes the temporary substation located in Jerseydale.
The Fire Chief and Deputy Fire Chief are paid positions the rest are volunteers.

The following table shows the extent of equipment resources currently available to Mariposa County Fire. Five of the structural engines (those used for structure fires such as homes) are more than 20 years old and are in fair condition. All eleven of the wildland engines (those used for wildland fires) average 4 years old and are in good condition. They also have eight type 1 water tenders four of which are more than 7 years old and are in fair condition. Seven Command vehicles average 3 years old and are in good condition. Two service vehicles are 12 years old and need to be replaced.

**Figure 5. Mariposa County Stations, Midpines, and Equipment Resources**

<table>
<thead>
<tr>
<th>Agency Name</th>
<th>Station Address</th>
<th>Contact Name, Title, Email</th>
<th>Phone Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mariposa County Fire</td>
<td>6364 State Highway 140, Midpines, CA</td>
<td>Harv Dearing</td>
<td>(209) 966-4591</td>
</tr>
<tr>
<td>Station 21</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mariposa County Fire</td>
<td>5082 Bullion Street, Mariposa Ca.</td>
<td>Jim Wilson</td>
<td>(209) 966-4330</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Resources</th>
<th>Wildland Engines</th>
<th>Dozers and Tractor Plows Type/ID/Capacity</th>
<th>Miscellaneous Capacity (Tankers, Tenders, Aircraft, etc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structural Engines</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type/ID/Capacity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12-Type 1 750 gals</td>
<td>11-Type 6 300gals</td>
<td></td>
<td>8-Type 1 WT-3000 gals</td>
</tr>
<tr>
<td>5-Type 2 500-750 Gals</td>
<td></td>
<td></td>
<td>2 service</td>
</tr>
<tr>
<td>1 Type 1- Station 21*</td>
<td>1 Type 6-Station 21</td>
<td></td>
<td>7 C&amp;C</td>
</tr>
</tbody>
</table>

*Station 21 is included with the County totals and itemized for Midpines.

Residential and road requirements for this equipment are a minimum of 10 foot wide with 14 feet of clearance. A minimum of 80 feet diameter is required for a turnaround or a hammerhead turn. All equipment can hook up to 2.5 inch National Hose thread, many residences are equipped with this adaptor on their water storage tanks.

This department has on its roster:

**Structure**
- 2- Hazmat Tech
- 24- Hazmat Ops
- All members are FF1
- 140 of these are FF2

**Wildland**
- 1- Incident Commander Type 1
- 2- Training Specialist (NWCG)
- 1- Air Operations Branch Director Type 1
- 2- Safety Officers Type 2
- 1- Medical Unit Leader
- 1- Supply Unit Leader
- 2- Division Group Supervisors

In 2009, Mariposa County Fire responded to 85 incidents within the Midpines area. 

_Midpines Community Conservation and Wildfire Protection Plan, Fire Protection_
In addition to providing service within the Midpines area, Mariposa County Fire will respond outside their boundaries to incidents in Madera and Tuolumne County. Mariposa County Fire has mutual aid agreements with Madera County, Tuolumne County, as well as BLM, USFS, and Yosemite.

Mariposa County Fire, as of this writing, needs more volunteers, two replacement service vehicles, and a more comprehensive prevention education program. Additional funding would help solve some of the problems. Mariposa County Fire is an entirely volunteer department that depends on the local community to supply the demand for qualified members.

California Department of Forestry and Fire Protection (CAL FIRE) The California Department of Forestry and Fire Protection (CAL FIRE) provides wildland fire protection for private, industrial, county, state, and municipal forestlands. CAL FIRE provides wildland fire protection to approximately 48,955 residents in their 1,933-square-mile service area in Madera, Mariposa, Merced SRA. Midpines is in Battalion #2 which has 11,833 people and covers 340 square miles.

All CAL FIRE staff is paid. CAL FIRE’s MMU, located near the Midpines area has 270 staff members including: 72 Fire Captains, 5 Fire Prevention Captains, 119 firefighters, and 18 Battalion Chiefs. CAL FIRE is funded through the state. CAL FIRE’s Madera Mariposa Unit headquarters is at 5366 Hwy 49 N, Mariposa, Ca. 95338.

There is one fire station located near Midpines, as shown in the following table.

**Figure 4. CAL FIRE Stations and Equipment Resources**

<table>
<thead>
<tr>
<th>Agency Name</th>
<th>Station Address</th>
<th>Contact Name, Title</th>
<th>Phone Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAL FIRE</td>
<td>5366 Hwy 49 N, Mariposa, Ca. 95338</td>
<td>Kevin Smith Battalion 4212</td>
<td>209-966-3622</td>
</tr>
</tbody>
</table>

**Resources**

<table>
<thead>
<tr>
<th>Structural Engines Type/ID/Capacity</th>
<th>Wildland Engines</th>
<th>Dozers and Tractor Plows Type/ID/Capacity</th>
<th>Miscellaneous Capacity (Tankers, Tenders, Aircraft, etc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>13 Type3 engines</td>
<td>3 Type 2 Dozers</td>
<td>5 Type 1 Hand crews</td>
</tr>
<tr>
<td></td>
<td>3 in Battalion 2</td>
<td>1 Type 2 Dozer in Battalion 2</td>
<td></td>
</tr>
</tbody>
</table>

CAL FIRE does respond to more than just wildland fires. This is primarily when a structural fire threatens wildlands, and usually during fire season. The number of incidents responded to by CAL FIRE in 2009 and 2010 to the present.

- Total number of incidents in MMU 2009 & to date, 2010: 33,134
- Total number of incidents in Battalion II 2009 & to date 2010: 3,038
6.2. Federal Fire Agencies

BLM contracts Fire Suppression to CAL FIRE and does not have initial attack response resources in the Midpines area.

**USDA Forest Service**

Within Midpines, the USFS provides wildland fire protection on Forest Service lands and private in-holdings within the boundaries of the Sierra National Forest (NF). Sierra NF’s service area includes the community of Midpines. The Sierra NF provides wildland fire protection to all residents in their service area in Midpines. The Bass Lake District of the Sierra NF has 87 staff members, all paid through federal government funding. Sierra NF Bass Lake District office is located at 57003 Road 225, North Fork, CA 93643.

In 2009, the Sierra NF responded to 48 fires, the Bass Lake District responded to 25 fires.

*Figure 1. Sierra National Forest USFS Stations and Equipment Resources*

<table>
<thead>
<tr>
<th>Agency Name</th>
<th>Station Address</th>
<th>Contact Name, Title</th>
<th>Phone Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midpines</td>
<td>6440 Jerseydale Road, Mariposa, CA</td>
<td>Engine Captain 12</td>
<td>(209) 966-2477</td>
</tr>
<tr>
<td>Sierra National Forest</td>
<td>1600 Tollhouse Road Clovis, CA 93611-0532</td>
<td>Joe Reyes Chief</td>
<td>(559) 297-0706</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Structural Engines</th>
<th>Wildland Engines</th>
<th>Dozers and Tractor Plows</th>
<th>Miscellaneous Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type/ID/Capacity</td>
<td>Type/ID/Capacity</td>
<td>Type/ID/Capacity</td>
<td>(Tankers, Tenders, Aircraft, etc.)</td>
</tr>
<tr>
<td>1 Type 3- Midpines</td>
<td>10 Type 3</td>
<td>1 Type 2 Dozer</td>
<td>2-type 2 tenders 3 Type 1 hand crews 2 type 2 CWN hand crews 2 Type 1 helicopters 1 Type 2 Helicopter 1 Type 1 Air tactical</td>
</tr>
</tbody>
</table>
Yosemite National Park

Within Midpines, the NPS provides wildland fire protection by Mutual Aid agreement. Yosemite National Park has 46 staff members, all paid through federal government funding. Yosemite National Park Fire Management office: PO Box 577, Yosemite National Park, Ca 95389

Figure 2. Yosemite National Park Stations and Equipment Resources

<table>
<thead>
<tr>
<th>Agency Name</th>
<th>Station Address</th>
<th>Contact Name, Title,</th>
<th>Phone Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>El Portal</td>
<td>9742 Rail Road</td>
<td>Engine Captain</td>
<td>(209) 379-2847</td>
</tr>
<tr>
<td></td>
<td>El Portal, Ca 95318</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yosemite National Park</td>
<td></td>
<td>Kelly Martin Chief</td>
<td>(559)372-0325</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Structural Engines Type/ID/Capacity</th>
<th>Wildland Engines</th>
<th>Dozers and Tractor Plows Type/ID/Capacity</th>
<th>Miscellaneous Capacity (Tankers, Tenders, Aircraft, etc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Type 1</td>
<td>1 Type 3-El Portal</td>
<td>1 Type 1</td>
<td>1-type 2 tenders</td>
</tr>
<tr>
<td>3 Type 1</td>
<td>4 Type 3</td>
<td>1 Type 2 Dozer</td>
<td>1 Type 2 Hand crew</td>
</tr>
<tr>
<td>2 Type 2</td>
<td></td>
<td></td>
<td>1 Type 2 Helicopter</td>
</tr>
</tbody>
</table>

2 This table is adopted from: Texas Forest Service, Texas A&M University, A Guideline for Developing Community Wildfire Protection Plans, tfsfrp.tamu.edu/training/cwpp/assets/pdf/CWPPTemplate.pdf
7. Risk Assessment: Identifying and Evaluating Assets at Risk

7.1. Assets at Risk in Midpines

7.1.1. Structures and Other Development Assets

7.1.2. Infrastructure Assets

7.1.3. Cultural Assets

7.1.4. Natural Assets

7.1.5. Conflicts between Natural Assets and Human Occupation

7.2. Assessing Risks in Midpines

7.2.1. Community-Identified Risk and Hazard Assessment Summary

7.2.2. Summarizing Risks in the Midpines

7.2.3. Developing Community Priorities
7. Risk Assessment: Identifying and Evaluating Assets at Risk

Assets at risk should not only include immediate impacts on homes, resources and watersheds, but also subsequent flooding and potential heavy metal contamination of drinking water. It is appropriate to distinguish conifer forests, which have income potential, from other vegetation types that do not. Revenue from commercial products can fund mitigation efforts in those locales.

7.1. Assets at Risk in Midpines

Midpines has a multitude of natural and manmade values (assets) that are at risk when major wildfires occur. Fires can wreak havoc not only on homes, recreational and commercial values, but also on nature in general by destroying fragile habitat and threatening rare and endangered species. Commercial and residential property is destroyed by wildfires within Midpines each year. Water, telephone and power utility companies have lost millions of dollars through both the direct and indirect effects of wildland fires. Wildfires also cause damage to scenic and aesthetic values in rural areas and directly impact the tourist trade.

7.1.1. Structures and Other Development Assets

7.1.2. Infrastructure Assets

Saxon Creek MPUD pumping station, an underground pipeline that extends from the Merced River to the Stockton Creek Reservoir. 1,000,000 gal capacity water storage that that can be accessed to support a wildland fire. This pipeline is a source of drinking water for the town of Mariposa. Midpines County Park, this is also the location of the Community Center and the Midpines Fire Station; Midpines CALTRANS maintenance facility.

Roads & bridges

State Highway 140- paved two lane highway and is a major route to Yosemite National Park. Primary access roads include Colorado Road paved and dirt, Oak Road (paved), Whitlock Road(paved), East Whitlock Rd(dirt and paved), Gros Jean Rd (paved), Carstens Drive(dirt), Ponderosa Way (paved and dirt), Buffalo Gulch Road (dirt and barely if not impassable to type 3 engines). There are bridges crossing Bear Creek on Colorado and Oak Roads as well as Highway 140.

Utilities

PG&E poles, lines & equipment: A this major transmission line bisects the planning and provides power to Yosemite National Park. Several 35 KV lines service Midpines’ homes and businesses. Sierra Telephone lines & equipment; the phone lines are underground and are not considered vulnerable to wildland fire. The equipment bunkers have propane tanks that vulnerable to wildland fire. Northland Cable lines & equipment: The lines are attached to PG&E utility poles. Cell phone towers. There are two cell phone towers in the Midpines area. Cell phone communication is not reliable due to the topography.
7.1.3. Cultural Assets

The Midpines area has, for generations, contained a substantial population of American Indians. The Yokut, Paiute, Miwok, Kesson and Chukchansi Peoples survived on the natural bounty that was provided by the Central California foothills' soil. The contemporary members of these tribes have banded together, forming the Southern Sierra Miwuk Nation. This cultural group currently strives to maintain language, identity, custom, and heritage along with forming an element essential in dealing with the various government agencies brought to the fore when California became a state in the United States of America.

The Southern Sierra Miwuk has extensive spiritual, cultural and traditional ties to the land in Midpines. From the abundant local plant life, tribal members would gather not only food staples, but also plants and herbs used for medicinal purposes as well as the raw materials required for basketry. While useful plants are manifold, too numerous to mention here, the following represent some of the more prevalent and important of the flora gathered by the local tribes.

Areas of Interest

Currently the Southern Sierra Miwuk have been designated several Bureau of Indian Affairs administered allotments in the Midpines area. These allotments provide federally protected land for specific families of the Southern Sierra Miwuk nation and, in the case of the Hearns allotment, contain post-European contact cemeteries for burial of family members. Along with these federal allotments, the tribe maintains a 137-acre contiguous mining claim which is reserved for mixed usage including mining and traditional ceremony.

Midpines is very archaeologically diverse, with some nineteen Indian village sites within its modern boundaries. These can be found along Saxon Creek, including Feliciana, Timber and Carstens Road as well as a documented village site just below the location of the old Acorn Inn located at the convergence of Triangle Road and Highway 140. Another village site can be found in the area directly behind the Midpines Store.

Midpines is also home to a number of traditional burial locations for the member tribes of the Southern Sierra Miwuk Nation. The Saxon Creek and Jones Creek areas were popular locations to bury the dead. The tribes would traverse the lands between village sites and gathering areas using an extensive network of trails, with one of the most important running perpendicular to the Merced River and crossing near Bricelburg.

Way Stations and Inns

Acorn Inn
The Midpines Resort
The Midpines Store

Mining

The following represents an incomplete list of the mines in the greater Midpines area. The ones chosen for inclusion benefit from a good paper trail and easily accessible information. Those interested in finding more sites of mining operations should be directed to A Map of Mariposa County California Showing Mines and Prospects. This map was published by the State of California Department of Natural Resources, Division of Mines, in 1957, and is available for purchase at the Mariposa County History Center. Another excellent list is provided on the website Ghost Town USA's Guide to the Ghost Towns, Mining Camps and Other Formerly Inhabited Places in Mariposa, California, by Gary B. Speck publications.

Alabama Mine
Golden Key Group
Colorado Quartz Mine
Diltz Mine
Buena Vista Mine  
Buffalo Mine

Nutmeg Mine
Schroeder Mine

**Mining Camps and Towns**
- Bear Creek
- Bonnet Garden
- Colorado
- Drunken Gulch
- French Camp
- Sherlock Town
- Whiskey Flat
- Whitlock
- Mono Camp

### 7.1.4. Natural Assets

#### Timber
In Midpines, there are approximately 64,000 acres of commercial timberland. Many small landowners own commercial timberland that do not harvest their timber. Much of the Midpines planning area were timbered prior to the 1920's. The USFS is the largest government owner of timberland in the Midpines.

#### Recreation and Scenic
Recreation is a major industry in the Midpines. Camping, hunting, fishing, and many other Yosemite bound tourist activities account for a large percentage of the revenue generated in this area. Wildfires may influence these activities in several ways. First, they may destroy the recreational facilities and the surrounding forest vegetation. Second, these facilities may be temporarily closed while fires are actively burning in and around these areas. Third, once a fire burns in an area, the public is once positive perception of the area may be slighted.

The Sierra Nevada foothills offer the public unsurpassed scenic landscapes that people from all over the world come to visit. Highway 140 leads to the middle entrance of Yosemite National Park and provides a substantial view shed east of the Merced River Canyon.

#### Air Quality
Midpines lies within the Mariposa County Air Pollution Control District the Mountain Counties Air Basin within its boundaries. During fire season, prevailing southwest winds tend to blow the smog generated in the valley and Bay Area into the Mountain Counties Air Basin. Smoke generated from wildfires that occur in the County adds to the already stagnant air conditions. Low inversion layers reduce the air quality further by trapping the smoke closer to the ground.

Prescribed burn projects minimize the negative effects that wildfires have on the air quality. Prescribed burning is performed when the weather conditions will allow quick dispersal of the smoke generated by the burn. These burns are aimed at reducing the amount of heavy brush and dense forest fuels. The lighter fuels that exist after a prescribed burn produce considerably less smoke when burned by a wildfire.

### 7.1.5. Conflicts between Natural Assets and Human Occupation
Throughout this entire planning area, human development has placed every habitat at risk of a stand replacing fire. Fire suppression over the last one hundred years has created stand-replacing conditions as was seen in the Telegraph fire of 2008. The entire hydrology either is compromised by
over stocking of vegetation or has been burned out by uncontrolled fire. A five-acre minimum parcel size keeps development less dense. Reducing the fire risk for a parcel is costly, labor intensive, and difficult for the average resident to maintain. At the lower elevations, around Rancheria Road for example, the brush fire regime was approximately once every seven years. Some areas have not been burnt in a hundred years and this has resulted in stand replacing, large-scale fires. People have built their homes above the fuel bed and are prone to be at risk from the resulting fire that will come.

7.2. Assessing Risks in Midpines

7.2.1. Community-Identified Risk and Hazard Assessment Summary

The following lists are perceived risks and hazards identified by residents. These features are not necessarily accepted by the Mariposa County Fire Safe Council or any Plan collaborators. They are provided here to identify community concerns.

7.2.1.1. Midpines Community-Identified Risks and Hazards

The information listed below was generated at the Midpines community meetings, over from 2005 through the present.
- Highway 140 Corridor
- Sarah Priest Allotment
- Illegal Marijuana gardens
- Power transmission lines
- Recreational users in the Merced River Canyon and Bear Creek

Additionally, two surveys 2005 and 2009 were conducted by the Mariposa County Fire Safe Council, Mariposa County High School ROP Grizzly Fire Department, Mariposa County Fire, CAL FIRE and the USDA Forest Service from residents in this planning area. These surveys identified; where the homes are, what they are constructed of, occupant special needs, and driveway accessibility.

7.2.2. Summarizing Risks in the Midpines

Based on the assets at risk and community-generated information above, and the analysis done in Appendices 4, 5, and 6, the following list documents assets and associated risks.
### Figure 1. Assets and Associated Risks

<table>
<thead>
<tr>
<th>Community, Structure, or Area at Risk</th>
<th>Fuel Hazard</th>
<th>Risk of Wildfire Occurrence</th>
<th>Structural Ignitability</th>
<th>Firefighting Capability</th>
<th>Overall Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rancheria Road</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Davis Road</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Colorado Road</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
<td>Moderate</td>
<td>High</td>
</tr>
<tr>
<td>Sherlock/Rumley Mine Road</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Ponderosa Way</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Colorado/Lakeside</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>East Whitlock</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Highway 140</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Foran/Penny Royal Rd</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Triangle/Buckingham Mtn</td>
<td>Medium</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>Grosjean/Lakeview</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
</tbody>
</table>

7.2.3. Developing Community Priorities

### Figure 2. Assets, Risks, and Priorities

<table>
<thead>
<tr>
<th>Community, Structure, or Area at Risk</th>
<th>Overall Risk</th>
<th>Community Value</th>
<th>Cultural Value</th>
<th>Overall Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acorn Inn</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>Hwy 140 View Shed</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Bear Creek Watershed</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Saxon Creek</td>
<td>Low</td>
<td>High</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>Midpines Community Park</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>PG&amp;E Transmission line to Yosemite</td>
<td>Medium</td>
<td>Medium</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td>Timber</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
</tbody>
</table>

---

1. The following information was ascertained in an interview with Southern Sierra Miwuk tribal chairman, Tony Brochini on August 5th, 2009.
2. Hazards are the potential fuel that can start a fire, while risks are the potential for the fuel to ignite.
3. These comments, risks, and hazards (and those identified for the other community planning areas) are made by meeting participants.
4. This table comes from Step 5a of the CFA Simplified CWPP Template, p. 5. [cafirealliance.org/cwpp/](http://cafirealliance.org/cwpp/).
5. From section 7.1 above.
6. This table comes from Step 5b of the CFA Simplified CWPP Template, p. 6.
7. From Section 7.1 and Figure 1 above.
8. Meeting Your Objectives: Midpines Fire Safe Action Plan

8.1. Summary of Objectives

8.2. Community-Identified Potential Projects

8.2.1. Midpines Community-Identified Potential Projects

8.2.2. Summary of Community-Identified Priority Projects

8.3. Existing Projects and Actions

8.3.1. Fire Safe Council, Homeowner's Associations, Community Organizations

8.3.2. Public Lands

8.4. Proposed Actions

8.4.1. Designation of Wildland-Urban Interface Areas

8.4.2. Designation of Communities at Risk

8.4.3. Defensible Space

8.4.4. Fuel Reduction

8.4.5. Reducing Structural Ignitability

8.4.6. Utilization

8.4.7. Education

8.5. Project Prioritization and Timing

8.6. Action Plan Summary

Shaded fuel break done by a masticator
8. Meeting Your Objectives: Midpines Fire Safe Action Plan

8.1. Summary of Objectives

Objectives include minimize ignitions, decreasing wildfire intensity and damage, and increasing wildfire permeability and resiliency.

- To prioritize and coordinate the grants process.
- Empower our community by affirming safe and healthy children, families, and individuals.
- Build and improve partnerships with all public and private entities; and
- Fire is part of the natural ecology of the Sierra Nevada. In contrast, wildfire damage to structures and human improvements needs to be minimized.
- Allow fire to play its natural role without loss. This describes the concept of permeability, whereby fire can spread through a community with minimal negative impact. The perfect situation will be one in which vulnerable resources are protected while fire burns under its normal regime.
- Rebound quickly after a wildfire burns through a community. Fires of small size or limited damage support a more rapid recovery. Communities with greater preparation for wildfires (rehearsed evacuations, established communication protocols, etc.) also have greater resiliency.

8.2. Community-Identified Potential Projects¹

8.2.1. Midpines Community-Identified Potential Projects

The information listed below was generated at Midpines community meetings, commencing in 2004 through the present.

- Identify and implement fuels reduction strategies on landscape scale
- Brushing back of roads in residential areas for safety and fire/emergency vehicle access.
- Reduce the risk of fires starting along the Highway 140 corridor.

8.2.2. Summary of Community-Identified Priority Projects

From the information generated and discussed above, the following actions have been identified as community priorities through the public process.

Figure 1. Community-Identified Priority Projects²

<table>
<thead>
<tr>
<th>Community, Structure, or Area at Risk</th>
<th>Type of Treatment</th>
<th>Method of Treatment</th>
<th>Overall Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midpines Interior</td>
<td>Hazardous fuel reduction/timber stand improvement</td>
<td>Mastication/ hand cutting</td>
<td>1</td>
</tr>
<tr>
<td>Colorado Road</td>
<td>Fuel Break</td>
<td>Mastication/ hand cutting</td>
<td>3</td>
</tr>
<tr>
<td>Rancheria Road</td>
<td>Fuel Break and hazardous fuel reduction</td>
<td>Mastication, hand cutting, prescribed fire</td>
<td>2</td>
</tr>
<tr>
<td>East side of Hwy 140</td>
<td>Fuel Break</td>
<td>Mastication/ hand cutting</td>
<td>4</td>
</tr>
</tbody>
</table>
8.3. Existing Projects and Actions

8.3.1. Fire Safe Council, Homeowner’s Associations, Community Organizations

The following projects were identified by the Mariposa County Fire Safe Council as being undertaken to further the goals of this plan.

*Figure 2. Mariposa County Fire Safe Council Existing Projects*

<table>
<thead>
<tr>
<th>Community, Structure, or Area at Risk</th>
<th>Project Name</th>
<th>Method of Treatment</th>
<th>Funding Needs</th>
<th>Acres Treated</th>
<th>Expected Completion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hwy 140 East Side</td>
<td>Feliciana Strategic Fuels Treatment</td>
<td>Mastication and chipping</td>
<td>$145,000</td>
<td>165</td>
<td>Dec 2011</td>
</tr>
<tr>
<td>Midpines</td>
<td>Defensible Space Homeowner assistance</td>
<td>Hand Crew</td>
<td>$25,000</td>
<td></td>
<td>On going</td>
</tr>
</tbody>
</table>

8.3.2. Public Lands

The following projects were identified by USDA Forest Service, Sierra NF as being undertaken to further the goals of this plan.

*Figure 3. USDA Forest Service Existing Projects*

<table>
<thead>
<tr>
<th>Community, Structure, or Area at Risk</th>
<th>Project Name</th>
<th>Method of Treatment</th>
<th>Funding Needs</th>
<th>Acres Treated</th>
<th>Expected Completion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midpines</td>
<td>Plumbar Creek</td>
<td>Mastication</td>
<td>34</td>
<td>2011</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Feliciana Mountain</td>
<td>Mastication</td>
<td>129</td>
<td>2013</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Feliciana Mountain</td>
<td>Prescribed Fire</td>
<td>130</td>
<td>2015</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Carstens Road</td>
<td>Prescribed Fire</td>
<td>96</td>
<td>2015</td>
<td></td>
</tr>
</tbody>
</table>
8.4. Proposed Actions

➢ Action items are identified with this arrow throughout this chapter.

8.4.1. Designation of Wildland-Urban Interface Areas

The wildland-urban interface (WUI) is a general term describing the area where homes and wildland meet. It also has a federal definition as the “line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuel as defined in the Federal Register.” It is within the WUI that specific federal management actions take place in order to reduce fuel risks based on guidelines established by the Healthy Forest Restoration Act (HFRA). According to HFRA, “the HFRA provides administrative procedures for hazardous-fuel-reduction projects on [USFS] and BLM lands in the WUIs of at-risk communities. The act encourages the development of Community Wildfire Protection Plans under which communities will designate their WUIs, where HFRA projects may take place.” At the same time, federal agencies are charged with developing WUI designations for the properties they manage.

In 2001, the Sierra Nevada Forest Plan Amendment (also known as the Framework for Conservation and Collaboration) identified two specific zones of treatment near communities, or WUI areas. The “Defense Zone” consists of a ¼-mile buffer around a community. The “Threat Zone” consists of a 1 and ¼ mile buffer beyond the Defense Zone. These buffers apply to areas adjacent to federal lands that are settled to a minimum density of one home per five acres.

8.4.2. Designation of Communities at Risk

Midpines has already been designated as a Community at Risk, either by federal or state designation.

8.4.3. Defensible Space

Through this process, several areas in Midpines have been identified as being either especially hazardous, with high fire risk, or both. It makes sense to focus enforcement of existing regulations in these Target Areas (see below) as well as to place stricter regulations on any new developments there.

The following statement from the California Attorney General’s office provides the legal framework for local governments to take action to ensure local fire safety:

The Legislature of the State of California hereby finds and declares that the unrestricted use of grass-, grain-, brush-, or forest-covered land within the State is a potential menace to life and property from fire and resulting erosion.... Counties, cities and counties, cities, and districts may adopt ordinances, rules, or regulations to provide fire prevention hazard conditions.

Target Areas in Midpines for Defensible Space, Fire Safe Construction, and Alternate Access Programs:

- Rancheria Creek
- Colorado Road
- Davis Road
- Grosjean Road

➢ Focus fire safety efforts in the Target Areas listed above, including defensible space, fire-resistant building, and providing for alternate access routes.
8.4.3.1. Defensible Space in New Developments

Development pressures are increasing in Midpines. This can be seen especially in the interface between wildlands and residential areas. The Midpines area has examples of development that do not meet adequate fire safety standards.

As more lands are being developed, the risk to existing homes generally increases. Mariposa County has a responsibility to current residents to minimize the impact on them from future development. One way to do this is to ensure that all new development adheres to accepted fire safety standards.

8.4.4. Fuel Reduction

Reducing hazardous fuel is a challenge for most communities in the western United States. The amount of accumulated fuel is far greater than most communities can afford to handle, hence the need to prioritize projects. The research is still unclear regarding the most effective and efficient way to reduce fuel without compromising ecosystem health. Research by Mark Finney at the Fire Science Lab challenges current theories in landscape-level fuel treatments and models strategic locations for fuel reduction treatments. That said, it is generally agreed that such treatments should be focused first around communities in the wildland-urban interface. Many residential areas in Midpines quality for such treatments, and thus were identified at the community meetings and are listed in this document.

Fuel reduction treatments need to begin within the Wildland Fuel Reduction Zone (see Background C). Beyond this, strategic locations around neighborhoods and communities should be identified and prioritized for creating shaded fuelbreaks. “Fuelbreaks are never designed to stop fires but to allow suppression forces a higher probability of successfully attacking a wildfire.”¹⁹ The combination of home construction modifications with effective defensible space and shaded fuelbreaks around communities is one of the best-known strategies to protect communities from wildfire.

There is no “one size fits all” prescription for shaded fuelbreaks. For example, the width can vary widely, ranging from 50 to 300 feet. “A shaded fuelbreak is created by altering surface fuel, increasing the height to the base of the live crown, and opening the canopy by removing trees.”¹⁹ Sample prescriptions are described in Background C. In addition to initial implementation, maintenance of fuelbreaks is often costly. Maintaining the shade helps to reduce these costs by slowing regeneration.

“Manual treatment is very expensive, and mechanical treatment is only feasible on gentle terrain. Prescribed fire can be effective (Schimke and Green, 1970) but there is potential for fire escape along the edges. Late winter burns, where the previous year’s production is cured, the perennials have not yet greened up, and the adjacent forest is not very flammable, may be a possible cost-effective treatment to avoid risk of escape from maintenance burns and achieve effective maintenance at low cost.”¹¹

A program should be developed in conjunction with CAL FIRE, BLM and the USFS to regularly burn shaded fuelbreaks where they are not in immediate proximity to residential development. This could be done in cooperation with local tribes, who have centuries of burning experience. To most effectively maintain fuelbreaks throughout Midpines, an “Adopt a Fuelbreak” program could be developed by the Mariposa County Fire Safe Council in cooperation with community or neighborhood groups, homeowner’s associations, and others whereby each group would be responsible for ongoing maintenance of their adopted fuelbreak. This should be done in cooperation with experienced fire professionals to ensure participant safety and fuelbreak effectiveness.

- Mariposa County Fire Safe Council develop an “Adopt a Fuelbreak” program for maintenance of fuelbreaks. Work with CAL FIRE, tribes, and other fire professionals to employ prescribed fire techniques where appropriate.

The following list includes the shaded fuelbreaks and other fuel-reduction projects that were prioritized for implementation in Midpines. These projects were generally identified at a community meeting, or otherwise resulted from this planning process. Projects were prioritized based on CAL FIRE threat levels, local resident priorities, and Federal Agency goals and objectives, with an emphasis on human population centers.
Mariposa County Fire Safe Council work with appropriate agency and community partners to fund and implement the following identified strategic fuelbreaks and fuel reduction efforts throughout Midpines.

Figure 4. Proposed Fuel Reduction Projects

<table>
<thead>
<tr>
<th>Community, Structure, or Area at Risk</th>
<th>Project</th>
<th>Treatment</th>
<th>Acres</th>
<th>Agency/ Landowner</th>
<th>Time Table</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feliciana Mtn.</td>
<td>Feliciana Strategic Fuel Treatment</td>
<td>Mastication/ Hand crew</td>
<td>115</td>
<td>BLM MCFSC</td>
<td>2011</td>
</tr>
<tr>
<td>Carstens Road</td>
<td>Timberlodge Strategic Fuel Treatment</td>
<td>Mastication</td>
<td>40</td>
<td>USFS MCFSC</td>
<td>2013</td>
</tr>
<tr>
<td>Triangle Road</td>
<td>Buckingham Strategic Fuel Treatment</td>
<td>Mastication</td>
<td>95</td>
<td>USFS MCFSC</td>
<td>2013</td>
</tr>
<tr>
<td>Colorado Road</td>
<td>Colorado Strategic Fuel Treatment</td>
<td>Mastication</td>
<td>106</td>
<td>CAL FIRE BLM/MCFSC</td>
<td>2014</td>
</tr>
</tbody>
</table>

8.4.5. Reducing Structural Ignitability

Reducing the chance that structures (our homes, businesses, etc.) will burn is an important component of any fire safety action plan. The following sections identify specific actions that will be taken to reduce structural ignitability.

8.4.5.1. Roofing

Efforts should be made to eliminate all untreated wood shake roofs. Shake roofs are a leading cause of home loss in wildfires. Research shows that homes with a non-combustible roof and clearance of at least 30 to 60 feet have an 85-95% chance of survival in a wildfire.¹²

Mariposa County Fire Safe Council, Mariposa County Fire, and CAL FIRE educate residents on the importance of replacing wood shake roofs.

8.4.5.2. Vent Openings

Provided that adequate defensible space is maintained, screening of vent openings with ¼” mesh corrosion-resistant steel screens will minimize the entry of embers (during the ember blizzard that comes with a wildfire) into attics (most important) and crawl spaces.

Mariposa County Fire Safe Council, Mariposa County Fire, and CAL FIRE educate residents on importance of steel vent screening.

8.4.5.3. Windows

Double-pane windows are far more effective in their ability to survive a wildfire, as well as being smart for energy conservation within your home.

Mariposa County Fire Safe Council, Mariposa County Fire, and CAL FIRE educate residents on need to have double-paned windows throughout their homes.

8.4.5.4. Decks
Provided that adequate defensible space is maintained, most solid wood decking is fire-resistant enough to withstand short-term heat load. The next greatest threat from decks is firefighter safety. Many new materials (synthetics) ignite more easily than wood and have a rapid structural collapse when subjected to high heat loads, creating a situation where firefighters could fall through.\textsuperscript{13} 

\begin{itemize}
  \item Mariposa County Fire Safe Council, Mariposa County Fire, and CAL FIRE educate residents on importance of fire-safe decking.
\end{itemize}

\subsection*{8.4.5.5. Outbuildings}

Outbuildings (e.g. storage, wood, and tool sheds) with less than thirty feet of separation from main structures place homes at a high risk of loss, because if they catch fire, they can more easily catch the house on fire.

\begin{itemize}
  \item Mariposa County Fire Safe Council, Mariposa County Fire, and CAL FIRE educate residents on need for separation of heat loads from their residence.
  \item CAL FIRE enforce clearing 30-100 feet around structures, as per State law.
\end{itemize}

\subsection*{8.4.5.6. Wood Piles}

Woodpiles with less than thirty feet of separation from structures often place homes at a high risk for loss.

\begin{itemize}
  \item Mariposa County Fire Safe Council, Mariposa County Fire, and CAL FIRE educate residents on need to have a minimum of thirty feet separation of firewood piles and woodsheds from their residence.
\end{itemize}

\subsection*{8.4.5.7. Propane Tanks}

Tanks with less than ten feet of clearance around them and thirty feet of separation from houses may place homes at a risk of loss.

\begin{itemize}
  \item Mariposa County Fire Safe Council, Mariposa County Fire, and CAL FIRE educate residents on need to have vegetative and flammable material clearance around propane tanks near their residence.
  \item Mariposa County Fire Safe Council, Mariposa County Fire, and CAL FIRE educate residents on need to keep propane tanks and other flammable materials at least thirty feet from homes and outbuildings.
\end{itemize}

\subsection*{8.4.6. Utilization}

Currently there is no revenue producing projects planned due to the lack of: Economical way to transport biomass or small diameter wood products to a processing facility. The closest facility is in North Fork, Ca. which is 70 miles from Midpines. There is not a local business utilizes other by products of fuel reduction or the demand for by products that would sustain those businesses as of this writing.

\subsection*{8.4.6.1. Small-Diameter Wood Products}

\begin{itemize}
  \item Mariposa County Fire Safe Council, and CAL FIRE, USDA Forest Service, timber industry, and economic development community work with local wood processing and manufacturing businesses to develop markets for small-diameter wood products. (Currently the Sierra Forest Collaborative Coalition is working on these issues.)
\end{itemize}

\subsection*{8.4.6.2. Biomass}

Currently the Sierra Forest Collaborative Coalition is researching existing regional biomass facilities and initiatives for possible models to implement in the planning area.

\subsection*{8.4.6.3. Signage of Roads and Structures (Addressing)}

Throughout Midpines, firefighters and other emergency personnel are faced with the challenge of finding homes quickly and safely during an emergency. At a minimum, existing California and Mariposa County...
standards that require streets and homes to be visibly addressed must be enforced. This enforcement action needs to be explored creatively.

- Law Enforcement, Fire Departments, CAL FIRE, and Mariposa County collaborate to enforce existing signage requirements for streets and residences.

### 8.4.6.4. Water

Water is critical for successful fire suppression. Minimum fire-fighting water requirements for developments not on a hydrant system are 3,500 gallons.

- **Encourage RAC-funded program to place water storage tanks on lands adjacent to federal lands.**
- **Mariposa County Fire safe Council explore funding for a water storage tank program on private lands not adjacent to federal lands.**
- **Mariposa County Assessor does not increase property values and taxes when water storage is added to private properties for fire protection.**

### 8.4.6.5. Evacuation Planning

A preliminary description of evacuation routes is contained in each community planning area map in Project File 2. However, a more detailed Midpines evacuation plan has been developed by CAL FIRE and the Mariposa County Sheriff’s Office. This evacuation plan has sensitive information that is not available to the public to review.

In terms of evacuation, gates can pose a serious obstacle. Automatic gates that do not open during power outages are especially dangerous.

- **Law Enforcement, Fire Chiefs, CAL FIRE, and Mariposa County Fire safe Council initiate informational programs to educate residents about the importance of easily passable gates during emergencies.**

Finally, are pet and livestock owners in the plan area prepared for emergencies and evacuation? Note that most shelters will not allow animals other than seeing-eye dogs. Are there locations for sheltering evacuated animals such as local fairgrounds? See [www.redcross.org/services/disaster/beprepared/animalsafety.html](http://www.redcross.org/services/disaster/beprepared/animalsafety.html) for more information.

### 8.4.6.6. Neighborhood Emergency Response Teams and Community Communication

A neighborhood or community emergency response team is a pre-planned group of people who will coordinate local efforts during an emergency. Responsibilities can include communication to agencies and outside entities, ensuring individual safety, delivery of first aid, or food and water services.

- **Midpines residents explore establishment of Neighborhood/Community Emergency Response Teams.**

Midpines would greatly benefit from having a neighborhood response team. Information is available from California’s Citizen Corps:

**Contact:** Sharron Leaon  
California Volunteers - Office of the Governor  
1110 K Street  
Sacramento, CA. 95814  
**Phone:** (916) 323-7646  
**Email:** citizencorps@CaliforniaVolunteers.ca.gov
8.4.7. Education

Many people are happy to create a fire-safe home if they understand why it is to their advantage. To this end, educational programs targeted at local residents are very successful.

Educational programs in the local schools are a great way to get the word out about fire safety and emergency preparedness. Several curricula exist and likely would only need minimal adjustments to be used in Midpines. Community projects such as fire safety education signs created by schoolchildren can be very effective. Informative signs could be created by local children and placed in high fire risk and hazard areas throughout the community.

- Mariposa County Fire Safe Council works with agencies and School District to implement fire safety curricula in all grade levels throughout the Midpines, in conjunction with community educational projects.
- Mariposa County Fire Safe Council works with insurance industry to fund and develop a service learning program in local high schools focused on fire safety and defensible space.

Trinity County Fire Safe Council has developed a “Big Red Truck Program.” In this program, they take a fire truck to homes as part of a defensible space assessment. This is a very graphic and effective way to show homeowners whether their home could be defended in a fire by first seeing if the truck can even safely make it to their home. This has also been a fundraiser for local fire departments, as they get paid for each assessment. A similar program in Midpines could be developed. It would be necessary to structure this with a set schedule to allow fire department volunteers to participate.

- Mariposa County Fire Safe Council works with Fire Chiefs to institute a “Big Red Truck Program” for defensible space education and assessments. Explore state and federal funding options for the program.

As stated elsewhere, development and real estate are healthy industries in Midpines. Through those ventures, new people are moving to Midpines, many of them from urban areas. These new residents often do not have experience with fire in a wildland-urban interface. Educational programs are needed targeting both the development and real estate industries, as well as their clients.

- Mariposa County Fire Safe Council, CAL FIRE, Mariposa County Fire, and Midpines Town Planning Advisory Group target fire safety educational efforts to new Midpines residents, especially those coming from urban areas and others with little experience with fire in the wildland-urban interface.

8.5. Project Prioritization and Timing

The following mitigations are prioritized based upon funding sources, value to risk ratio, and the ability to realistically complete these projects:
- Colorado Road Fuel Break
- Timberlodge Fuel Break
- Buckingham Fuel Break
- Midpines Defensible Space
- Midpines Interior Strategic Fuel Treatment
- Education and Outreach

This list and the priorities listed will be merged into the Mariposa Countywide Community Wildland Fire Protection Plan and prioritized with the other 17 Communities that listed. Once Midpines develops their own Fire Safe Committee they will be able to apply for grants without having to compete for priorities countywide.
8.6. Action Plan Summary

The following is the Action Plan for Midpines as identified through this fire planning process.

Figure 5. Plan Name Action Plan Summary

<table>
<thead>
<tr>
<th>Community, Structure, or Area at Risk</th>
<th>Project</th>
<th>Agency/Landowner</th>
<th>Funding Need</th>
<th>Funding Source</th>
<th>Time Table</th>
<th>Community Recommend?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carstens Ponderosa Way</td>
<td>Timberlodge Fuel Break</td>
<td>Private</td>
<td>$105,000</td>
<td>Grant</td>
<td>2013</td>
<td>Yes</td>
</tr>
<tr>
<td>Triangle Hwy 10</td>
<td>Buckingham Fuel Break</td>
<td>Private</td>
<td>$185,000</td>
<td>Grant</td>
<td>2013</td>
<td>Yes</td>
</tr>
<tr>
<td>Colorado Road</td>
<td>Colorado</td>
<td>BLM/Private</td>
<td>$164,000</td>
<td>Grant</td>
<td>2015</td>
<td>Yes</td>
</tr>
<tr>
<td>Midpines</td>
<td>Midpines Interior Fuel Treatment</td>
<td>CAL FIRE MCFSC/NR CS</td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Midpines</td>
<td>Defensible Space</td>
<td>MCFSC</td>
<td>$25,000</td>
<td>Grant</td>
<td>2012</td>
<td>Yes</td>
</tr>
</tbody>
</table>

1 These comments, and others identified at community meetings, are suggestions made by meeting participants. By listing them here we do not take a position on the statement. They are listed solely to demonstrate community concerns.
2 The table formats used in this chapter were taken from the California Fire Alliance Simplified CWPP Template to ensure consistency among plans. CFA CWPP Simplified Template, Step 6a, p. 7, cafirealliance.org/cwpp/.
3 Adapted from CFA Simplified Template, Step 7 and USFS Six Rivers National Forest project summary table.
5 Healthy Forests Initiative and Healthy Forests Restoration Act (February 2004). Interim Field Guild, Title I, Wildland-Urban Interfaces Within or Adjacent to At-Risk Communities, FS-799.
8 www.firelab.org/index.php?option=com_content&task=view&id=43&Itemid=82. outreach.cof.orst.edu/resilientfire/finney.htm
10 Agee et al. (2000). p. 56.
11 Agee et al. (2000). p. 60.
13 Further information on this available through the California State Fire Marshal’s Building Materials Listing, osfm.fire.ca.gov/bmlisting.html.
14 RAC is the Resource Advisory Committee. Most National Forests have an appointed RAC. Contact your local Forest Service for more information.
15 Adapted from CFA Simplified CWPP Template, Step 7, p. 9.
9. Facilitating Midpines Fire Safety in the Long Term ................................................................. 2
   9.1. Monitoring ......................................................................................................................... 2
   9.1.1. Strategic Planning and Projects .................................................................................... 2
   9.1.2. Project-Specific Ecological Monitoring ....................................................................... 5
   9.2. Project Maintenance ......................................................................................................... 5
   9.3. Updating This Plan .......................................................................................................... 5
   9.4. Resources Needed to Support Ongoing Efforts ............................................................... 5

A community plan is needed to reduce the impacts of a wildland fire!
9. Facilitating Midpines Fire Safety in the Long Term

9.1. Monitoring

A critical outcome related to the Midpines CCWPPs is related to the change in fire behavior, as affected by the number and type of fuels treatments that occur because of priorities identified within the CWPP. The HFRA (Section 102(g)(5)) instructs the USFS and DOI to establish a collaborative multiparty monitoring, evaluation, and accountability process when significant interest is expressed in such an approach. This, however, will be subject to the participating agencies having the people and budget to do so.

Multiparty monitoring gives communities an opportunity to assess environmental, social, and economic outcomes related to fuels reduction projects. Multiparty monitoring also builds trust and provides an opportunity for residents to learn about fire-adapted ecology. The USFS Collaborative Forest Restoration Program in the Southwest offers a set of guidelines for monitoring community-based forest restoration. Communities engaged in ecological monitoring of hazardous fuels reduction projects can use these guidelines. They provide an overview of the multiparty monitoring process, ecological and socioeconomic goals and indicators, and examples of measures, data sources, and tools that can be used in conducting this kind of monitoring. The CFRP program also developed a series of handbooks to help communities conduct this monitoring. These resources can be downloaded directly at http://www.fs.fed.us/r3/spf/cfrp/monitoring/index.shtml.

9.1.1. Strategic Planning and Projects
<table>
<thead>
<tr>
<th>Start Year</th>
<th>Project Title &amp; Description</th>
<th>Proposed Funding Source</th>
<th>Current Status (Date)</th>
<th>Current Funding Required</th>
<th>Year 1 Project Status &amp; Update</th>
<th>Year 2 Project Status &amp; Update</th>
<th>Project Completed Date</th>
<th>Out-year Maintenance Required?</th>
<th>Responsible Party</th>
<th>Funding Source(s)</th>
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<tbody>
<tr>
<td>2010</td>
<td><strong>Feliciana Fuel Break</strong></td>
<td>Mariposa County Fire Safe Council</td>
<td>Started 2010</td>
<td>$145,000</td>
<td>Environmental Study and clearances</td>
<td></td>
<td></td>
<td>Yes, Mariposa County Fire Safe Council</td>
<td>BLM</td>
<td>VMP</td>
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<tr>
<td>2011</td>
<td><strong>Buckingham Fuel Break</strong></td>
<td>Mariposa County Fire Safe Council</td>
<td></td>
<td>$148,000</td>
<td></td>
<td></td>
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<td>USFS</td>
<td></td>
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<tr>
<td>2011</td>
<td><strong>Timberlodge Fuel Break</strong></td>
<td>Mariposa County Fire Safe Council</td>
<td></td>
<td>$117,000</td>
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<td></td>
<td></td>
<td></td>
<td>USFS</td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td><strong>Midpines Interior Strategic Fuel Treatment</strong></td>
<td>CFIP,EQIP Mariposa County Fire Safe Council</td>
<td></td>
<td>TBD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>NRCS CAL FIRE BLM</td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td><strong>Colorado Road Fuel</strong></td>
<td>Mariposa County</td>
<td>TBD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>BLM SNC</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Break</th>
<th>Fire Safe Council</th>
<th></th>
<th></th>
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<th>CAL FIRE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013 Mt Bullion to Midpines Fuel Break</td>
<td>CAL FIRE SNC</td>
<td>$800,000</td>
<td></td>
<td></td>
<td>CAL FIRE Prop 84</td>
</tr>
<tr>
<td>2013 Fuel Break Maintenance</td>
<td>Midpines Residents</td>
<td>TBD</td>
<td></td>
<td></td>
<td>Mariposa County Fire Safe Council</td>
</tr>
</tbody>
</table>
9.1.2. Project-Specific Ecological Monitoring

As part of the CCWPP process, the Mariposa County Fire Safe Council should hold an evaluation meeting with partnering agencies, stakeholders, and collaborators to assess the effectiveness of the CWPP and to revise mitigations and priorities. This evaluation should take place in November to allow time to develop mitigations and apply for grants in a meaningful time frame.

9.2. Project Maintenance

Currently there is not a program or plan to maintain completed projects. One solution would be to start an “Adopt a Fuel Break” program to encourage local stakeholders to maintain fuel breaks. There is the “Davis Road” association that brushes back Davis Road. The Mariposa County Fire Safe Council can offer support to such groups in the form of a chipper, technical advice, and be a fiscal sponsor for grant applications.

9.3. Updating This Plan

No plan is ever permanent. This plan was written in 2010 based on current conditions and best available information. The field of fire safety is rapidly changing. It is likely that new developments will occur in the coming years. Therefore, it will be important to review this plan at least every year and update it as needed. Copies of this plan will be available for public review at Mariposa County Fire Safe Council Office.

9.4. Resources Needed to Support Ongoing Efforts

Because of this process, the need for the community to continue its fire safety efforts over time will need the support of the following resources:

Mariposa County Agriculture Commission- Identification of invasive plant species and their eradication.

CAL FIRE- CFIP and VMP project funding

NRCS-To assist with EQIP grants.

USDA Forest Service-Technical assistance and grant funding through HFRA

USDOI BLM-Technical assistance and grant funding

Sierra Nevada Conservancy-Assistance with watershed areas, technical assistance, and possible grant funding

Mariposa County Fire Safe Council-Assist with grant funding, grant administration, and project management. The Council may also act as a fiscal sponsor for local Midpines Fire safe Committee.
Reference A—Glossary

1-Hour Fuel: Fuels that are less than ¼ inch in diameter. These fuels will only take about an hour to lose or gain two-thirds of the equilibrium moisture content of their environment.

10-Hour Fuel: Fuels that range in diameter from ¼ inch to 1 inch, and take about ten hours to lose or gain two-thirds of the equilibrium moisture content of their environment.

100-Hour Fuel: Fuels that range from 1 inch to 3 inches and take about 100 hours to lose or gain two-thirds of the equilibrium moisture content of their environment.

20-Foot Wind Speed: The speed of wind, measured 20 feet up, in miles per hour.

90th Percentile: Weather observations that are among the most extreme—only 10% of the observations are more extreme under 90th percentile conditions.

Access Roads: Roads that allow entrance into and out of a property.

Adaptive Management: An approach to managing the environment/property that is based on a “learn by doing” technique that adjusts to changing conditions. Adjustments in management change over time as new information is learned.

Age Classes: A way of classifying the age range of trees or forests, usually divided into 20-year age classes.

Aloft Winds: Upper winds that occur in the atmosphere above the surface level, generally 2,000 feet and higher.

Anchor Point: The point at which firefighters begin fire line construction, usually blocked from the spreading fire to protect firefighters from harm.

Anthropogenic: The result of human activities or the influence of humans on nature.

Aspect: The direction that a slope faces—north, south, east, west, etc.

Backfire: A technique used in certain locations to direct fire spread against the wind while doing prescribed burns.

Bare Mineral Soil: The exposure of a layer of inorganic earth below the litter and duff layer that is composed of sand, silt, and clay and has little combustible materials.

Benches: Flat landscape areas that occur along foothill and mountainous slopes. These “benches” can be the result of natural land formations through slope movement and sluffing, or can be the result of land alteration by previous resource extraction activities such as logging.

Biodiversity: The abundant variety of plant, fungi, and animal species found in an ecosystem including the diversity of genetics, species, and ecological type.

Biomass: The total weight of living matter in a given ecosystem. May also be defined as the total weight of plant debris that can be burned as a fuel.

Blackline: Preburning of fuels adjacent to a control line before igniting a prescribed burn.

Broadcast Burning: A controlled burn, where the fire is intentionally ignited and allowed to proceed over a designated area within well-defined boundaries for the reduction of fuel hazard after logging, for site preparation before planting and/or for ecosystem restoration.

Broadcast Patch Burning: A controlled burn, where the fire is intentionally ignited and allowed to proceed over a designated smaller area for site specific management of fuels or plant community enhancement for certain groupings of vegetation or patches.

Broadcast Underburning: A method of burning where a prescribed fire is allowed to burn in the understory of a designated area to reduce fuel hazards or as a silvicultural treatment, or both.

Brush: To control and/or clear small woody debris.

Brushing: The act of removing brush such as dead materials, shrubbery, and branches.
Reference A—Glossary

BTU: British Thermal Units (heat)/feet/second.

Burn Plan: Detailed document with specific information on prescribed burns. Used by the burn boss for implementing specific prescribe burn projects.

Burn-Out Time: The length of time in which flaming and smoldering phases occur in a given area or for the whole fire.

Cambium: The growing layer of a tree located between the bark and wood of the stem.

Canopy: The top layer of a forest or tree, which is formed by leaves, needles, and branches creating a continuous cover.

Cavities: A hole or opening, usually in a decayed area of a tree, where birds and animals may live.

Chunked: Completing the pile burning process by turning in, or placing the unburned woody material ends into the fire ring.

Closed-Canopy: Occurs when the canopies of trees touch and blend together enough so that light does not reach the floor of the forest.

Codominant: Species that share dominance or are of equal importance. For example, a fir-pine forest may be dominated by both firs and pines.

Colonize: The act of establishing populations in new sites, such as burned areas, by seed.

Compact: To pack closely or tightly together, as in the fragments of soil being compacted from heavy equipment, thereby limiting the ability of oxygen or water to pass freely.

Composition: The percentage of each species that comprise a given area.

Conks: Shelf-like mushrooms that grow on trees, stumps, and downed wood. They are known for their wood decaying characteristics.

Containment: The process of completely surrounding a fire with natural or man-made fuel breaks.

Contour Falling: A treatment that utilizes positioned logs to control erosion from water flow. Logs are offset on the contour of the slope so the logs slow the water by creating a meandering path of travel.

Control: The act of managing a fire, which generally entails a completed control line around the fire.

Convection Column: Heat generated from a fire into a column that rises into the air at varying heights, depending on the size of the burn.

Cover: Any plants or organic matter that holds soil in place or grows over and creates shade that provides wildlife with an area to reproduce and find protection from predators and weather.

Crop: The amount of fruits a group of plant yields in one growing season.

Crown Density: A measurement of the thickness or density of the foliage of the tree crown in a stand.

Crown Fire: A fire that spreads from treetop to treetop, and is characteristic of hot fires and dry conditions. Crown fires are generally more complex to control than fires on the surface.

Crown Scorch: When a fire or a convection column burns a portion or the entire crown of a tree.

Crown Structure: The structure or arrangement of the uppermost branches and foliage of a tree.

Dappled Light: When the forest canopy has small openings where filtered sunrays project through the tree tops onto the forest floor.

DBH: Diameter at Breast Height, a measurement of a tree’s diameter at the level of an adult chest (approximately 4.5 feet above the ground.)

Dead Out: When a fire has completely burned out or been entirely extinguished.

Decay Classes: Decomposing wood is categorized based on the level of decomposition, broken into five classes.
Reference A—Glossary

Defensible Fuel Profile Zone: Defensible Fuel Profile Zones: a term used by federal and state land management agencies to describe a larger shaded fuelbreak normally 0.25 mile in width. The object of these measures are to reduce the fuel ladder and add space between the tree top canopy in order to keep the fire out of the canopy on the ground.

Defensible Space Zone: The one-hundred foot zone around the home.

Defensible Space: An area around a home/structure that has been cleared of flammable materials to act as a barrier between wildfires and property, thereby decreasing the risk of damage or loss. This space is now defined as 100 feet around a structure in California.

Dicing: Cultivating or roto-tilling the soil.

Disturbance Factor: The aspects that influence changes to the environment, both human-caused and natural occurrences, such as logging or development, and fire, wind, or floods.

Disturbance Regime: The characteristic and usually historical pattern of disruptions to the environment (such as fire or flood or drought, for example) in a given area.

Disturbance: Various activities that disrupt the normal state of the soil such as digging, erosion, compaction by heavy equipment, etc.

Diurnal: Belonging to or active during the day.

Doghair: An excessively dense stand of trees. An example is an acre with 35,000 trees, all smaller than seven inches DBH.

Dominant: The species that is the most abundant or influential on an ecosystem. For example, a dominate tree is one that stands taller than the rest and receives full sun.

Downed Woody Debris: The remains of dead trees, branches, and various woody brush that sit on the forest floor—generally refers to trunks of trees.

Draft: Using the forces of suction to draw water from ponds, swimming pools, or other bodies of water. This technique utilizes a partial vacuum formed by a suction pump and atmospheric pressure. The water is then moved where it is needed.

Draw: A channel that is shallower than a ravine.

Drip Torch: A device held by hand to ignite fires by dripping flaming liquid fuel on the materials to be burnt.

Drip-Line Thinning: Clearing ladder fuels under the drip-line circumference of a leave tree.

Drip-Line: The boundary of a tree’s canopy, generally estimated by the extent of the tree’s outermost limbs and the circular moisture line formed when rainfall drips from the limb tips.

Duff: A layer on the forest floor that is made up of decomposing organic matter such as leaves, needles, and small branches.

Ecosystem: A community of organisms including plants, animals, and fungi and the non-living aspects of the physical environment that make up a specific area. Examples of ecosystem types include a pond or a forest.

Ecotone Edge: The boundary between two or more ecosystems. The change in ecosystems may be due to elevation, soil type, disturbance, or other factors.

 Ember Attack: Embers blown by the wind during a firestorm that accumulate at intersections between horizontal and vertical members on the outside of your house, igniting debris and combustible materials. Embers can also enter into openings (e.g., attic vents and other wall openings), igniting debris on the inside of your home.
Reference A—Glossary

Embers: A piece of wood or a coal that is hot and glowing from fire activity, often dispersed by wind ahead of a fire. Also called firebrands.

Endemic: A plant that is native to a certain limited area and found nowhere else.

Ephemeral Stream: A stream or watercourse that does not flow all year round, only during rainy season.

Ephemeral: Meaning short duration or life, as in an ephemeral stream that only exists after a rainstorm or during the rainy season.

Erosion: The removal of soil over time by weather, wind and/or water such as rain or water runoff from roads.

Escape Route: A path or road that has been preplanned to get out of harm’s way in a fire situation. The route should be well understood by all participants, and if there is any unclear direction, the path should be marked.

Escapes: Wildfires that cannot be contained with the first attempts at suppression.

Excessive Stems: Stems (tree or shrub main trunks) in high density.

Extension Agent: An employee from the government or a university who provides information to rural communities about agriculture, land management and/or resource management. In California, the University of California Cooperative Extension (UCCE) provides this service. For more information on UCCE, see: http://ucanr.org/.

Extinction Moisture: The moisture level in fuels when fires tend to stop burning.

Faculative Sprouter: A species of plant that can resprout after a fire from the rootstock, although this may not be its usual method of reproduction in the absence of fire. The ability to resprout may be dependent on the intensity of the fire.

Feathering: A process that reduces the appearance of change between treated and untreated sites by gradually softening the transition.

Fire Adapted: The ability of organisms or ecosystems to make long-term genetic change for the most advantageous response to fire-prone environments.

Fire Behavior: The combination of fire spread, heat output, flame length intensity, etc. as the fire responds to weather, topography, types of fuels, etc.

Fire Climax: The stage of vegetation that is sustained with frequent fire.

Fire Free Zone: A five-foot minimum zone around the home that is free of all fuels.

Fire Ignition: The act of setting fire or igniting a fire.

Fire Intensity: A measurement of the heat released in an area during a specific amount of time (btu/ft/sec). Intensity has a large influence on an ecosystems' recovery from fire.

Fire Prevention: Actions taken by homeowners and community members to lessen wildfires and damage caused by wildfires. Includes education, enforcement, and land management practices.

Fire Regime: The characteristic patterns of fire in a given ecosystem. May include fire behavior, distribution, frequency, size, and season.

Fire Resiliency: The ability of an ecosystem to maintain its native biodiversity, ecological integrity, and natural recovery processes following a wildland fire disturbance.

Fire Return Interval: A period of time between fires in a specific region or area.

Fire Safe Council: Public and private organizations that comprise a council intended to minimize the potential for wildfire damage to communities and homeowners, while also protecting the health of
Reference A—Glossary

natural resources. Goals are achieved by distributing fire prevention materials, organizing fire safety programs, implementing fuel reduction projects, and more.

**Fire Safe Practices:** Activities such as creating defensible space, firebreaks, access to your home, fire-resistant landscapes, changes to your home in terms of material and design, etc., that make your home/property safer in wildfire situations.

**Fire Weather:** The various types of weather that affect how a fire ignites, behaves, and is controlled.

**Fire-Adapted Ecosystem:** A local mix of mature natural vegetation (ideally native species but often found in combination with exotic species) that maintains its ability to survive and regenerate, and perhaps even to thrive, with regular disturbance from wildfire. Some species may actually require fire to trigger seed maturation, such as the giant sequoia. Opportunistic species benefit from fire and the openings it can create in a woodland; this is part of their adaptation.

**Firebrands:** A piece of wood or a coal that is hot and glowing from fire activity, often dispersed by wind ahead of a fire. Also called embers.

**Firebreak:** A strip of land that has been cleared of vegetation to help slow or stop the spread of wildfire. It may be a road, trail, or path cleared of vegetation or other burnable materials. A firebreak could also be a stream.

**Fire-Resilient Landscape:** A natural landscape featuring plants that have adapted to local wildlife conditions, or a domestic outdoor space where appropriate actions have been taken to make it less vulnerable to wildfire and certainly less prone to causing one.

**Fire-Resistant Building Materials:** Materials used in the construction of a house that are resistant to ignition when exposed to radiant heat or flames. Examples include clay tile roofs, metal roofs, and stucco siding.

**Fire-Sensitive:** A species of tree that is more susceptible to fire damage. Sensitivity may be due to thin bark or easily ignitable foliage.

**Fireshed:** An area or areas with similar fire management, fire history, and risk of wildland fire issues.

**First Entry Thinning Treatment:** The Initial Entry first stage of tree thinning performed in a fuels reduction treatment.

**Flame Length:** The span of the flame from the tip to the base.

**Flammable:** A quantity of a substance that makes it likely to catch fire, be easily ignited, burn quickly, and/or have a fast rate of spreading flames.

**Flanks:** Slope areas on both sides below a ridge top.

**Flasy Fuel:** AKA fine fuels, such as grass, leaves, pine needles, ferns, moss and some kinds of slash which ignite readily and are consumed rapidly when dry.

**Foehn Events:** A wind that blows warm, dry, and generally strong, creating extremely dry fuel and dangerous fire potential.

**Forest Stand Density:** The amount of trees in a forest per unit area. Can be measured in terms of basal area and crown cover.

**Forest Stand Enhancement:** A combination of both silvicultural thinning practices and other forest restoration activities such as prescribed fire, which aim to increase the health, resiliency, and vigor of tree communities within a forest ecosystem.

**Fragment:** Used as a verb, the transformation of forests or vegetation into one or more patches of smaller size than the original area. Can also refer to one of the patches.
Reference A—Glossary

**Fragmentation**: The transformation of forests or vegetation into one or more patches of smaller size which can occur by natural means such as fire, disease, etc., or by management practices such as timber harvesting.

**Fuel Bed Height**: A measurement of the height of fuel composition on the forest floor.

**Fuel Complex**: The volume type, condition, arrangement, and location of fuels.

**Fuel Continuity**: The amount of continuous fuel materials in a fire’s path that allows the fire to extend in vertically towards the crowns of trees or horizontally into the forest or other fuels.

**Fuel Ladder**: A ladder of vegetation from the forest floor into the canopy (or upper branches) of the trees that allows fire to climb upwards.

**Fuel Load Conditions**: The amount of combustible material (dead and live fuels), which relates to the fuel model of a given site, the slope, aspect, and the fuel’s moisture content.

**Fuel Modification**: The management of fuels for fire safety. Examples include prescribed burns and creation of firebreaks.

**Fuel Treatment**: The act of removing burnable materials to lower the risk of fires igniting and to lessen the likelihood of damage to property and communities. Treatments may include creating a defensible space, developing fuelbreaks, initiating prescribed burns, and thinning vegetation.

**Fuel Volumes**: The quantity of fuel in a specified area that is susceptible to fire consumption.

**Fuel**: All burnable materials including but not limited to living or dead vegetation, structures, and chemicals that feed a fire.

**Fuelbreak**: A strategic area where fuel volumes have been intentionally reduced to slow down a fire and reduce its flame lengths and intensity; as distinguished from fire breaks where all fuels are removed to bare mineral soil for fire suppression.

**Future Desired Condition**: The short-term and long-term goals desired from activities on a property. It is important to keep Conservation Principles in mind.

**Generalist**: A species with the ability to utilize a wide variety of resources and tolerate various environmental situations.

**Girdling**: A technique used to kill trees by cutting through the cambium and sapwood layer around the circumference of the tree. The flow of water and nutrients is broken and the tree eventually dies.

**Global Positioning System**: A hand held navigational device that uses satellites to determine positions on the earth.

**Green Islands**: Patches of live tree and plant communities retained within a mosaic thinning prescription.

**Ground Fuels**: The layer of combustible materials that exists below the layer of surface litter. This layer includes plant roots, duff, etc., which will combust without a flame.

**Ground-Disturbing Activities**: Actions that interrupt the natural condition of the ground, such as digging and compaction from heavy equipment.

**Growth/Vigor**: The ability of plants to exhibit healthy natural growth and survival.

**Hammerhead Turnout**: A “T” shaped roadway that allows for large emergency vehicles to turnaround. This space allows for a three-point turnaround and should be as wide as other surrounding roads.

**Hand Pile and Burn**: The act of gathering slash into piles by hand and then burning the pile.

**Hand Pile Burning**: Hazardous fuels piled by hand for burning in a manner that will not damage surrounding trees or soil.
Reference A—Glossary

Heat Output: The total amount of heat a fire released in a specific area during the passage of the flaming front.

Heat Per Unit Area: The amount of heat produced by burning fuels in a given unit area through the entire duration of the fire.

Herbaceous Overstory Vegetation: The vegetation layer that forms the uppermost canopy layer and is partly composed of non-woody plants that die back in the winter.

Herbaceous Understory Vegetation: The layer of vegetation under the forest canopy that is composed of non-woody plants that die back in the winter.

High-Pruning: Cutting of both the dead and live branches ten to fifteen feet from the base of the tree (height to live crown). This is done on larger trees to separate the fuel connectivity from the ground to the crown of a tree.

Historic Natural Conditions: The natural condition of a property/area that occurred in the past before fire suppression and industrial activities. Old photos, settler’s journals, elder’s oral history, and clues on the property such as old stumps may be helpful in identifying the historical natural condition of and area.

Home Ignition Zones: Includes the home and a 100 to 200 foot area around the home.

Hydrology: A science that deals with the waters of the Earth including movement, distribution, seasonal patterns, and conservation.

Hydrophobic: Literally meaning “water-fearing” as in a substance such as oil, which does not mix well with water. Also refers to a soil that will no longer absorb water.

Ignition Specialist: A trained professional who specializes in ignition and prescribed fire techniques and management. Ignition specialists are certified through the National Wildfire Coordinating Group and have years of experience in wildland fire suppression and prescribed fire use, and have met all necessary requirements to perform firing applications.

Ignition Zones: The zone where combustion is initiated.

Ingress-Egress: Roads and other avenues to enter and leave your property. The act or right to come in, or go through as in entering a property (ingress). The act or right to, depart or go out as in exiting a property (egress).

Ingrowth: The trees that grow large enough in a season to be considered a sapling or pole timber.

Initial Data Assessment: Information gathered from initial site assessment based on a series of questions.

Initial Entry: The first stage of vegetation and tree thinning performed in a fuel reduction treatment.

Initial Site Assessment: The preliminary steps of a site assessment where fuel hazards and health conditions of a property are determined. Information is gathered to help plan a fuel hazard reduction treatment.

Invasive Weeds: Undesirable plants that are not native and have been introduced to an area by humans. These plants generally have no natural enemies and are able to spread rapidly throughout the new location. Some examples include Himalayan Blackberries, English Ivy, and Scotch Broom.

Jack Pots: Generally, small pockets of dense fuels which could allow a fire to flare up and burn more intensely.

Key Ecosystem Component: An important piece of an ecosystem such as soil, native species, or mature/rare habitats, which are essential to the stability of an ecosystem.

Ladder Fuel Continuity: The amount of continuous fuel materials in a fire’s path that allows the fire to extend in a vertical direction towards the crowns of trees.
Reference A—Glossary

Ladder Fuels: Materials such as shrubs or small trees connecting the ground to the tree canopy or uppermost vegetation layer. In forests, this allows fire to climb upward into trees.

Layout: In this case, defining and designating forest operations for a specific location.

Leading Edge: The foremost part of a fire that is guiding the fire in the direction of travel.

Leave Trees: Trees that have been selected to remain standing in an area of thinning or harvesting.

Leave-Patches: Swaths or clusters of trees or other vegetation that have been selected to remain standing in an area of fuel treatment.

Limb Up: To remove the lower branches from a woody plant to create a defined space between the forest floor and the canopy.

Limbing: Removing selected branches of a standing or fallen tree.

Live Crown Percentages: The proportion of the height of the tree on which live branches and foliage are present.

Lop and Scatter: The act of cutting and evenly spreading branches over the ground to reduce fire hazard and erosion potential while promoting the decomposition of branches via their close proximity to the ground.

Mast: Nuts or fruits of trees and shrubs such as acorns, walnuts, or berries that collect on the forest floor and are a food source for animals.

Merchantable: Timber that is viable for sale under the current economic situation. This is generally determined by the part of the stem (trunk) that is suitable for timber products.

Mesic: The condition of being normally moist, as in vegetation or ecosystems.

Mixed-Structural Thinning: Practice of selectively eliminating multi-stemmed species to achieve a variety of densities where either one stem is retained or groupings of stems are retained.

Modify Fire Behavior: Using fire-safe practices such as fuel treatments, thinning, creating firebreaks, etc., to change the way a fire will behave, with a goal of slowing it down and/or suppressing it more easily.

Moisture Content: The dry weight of a material, such as wood or soil, compared to the wet weight of the same material. It is not unusual for live material to have moisture content greater than 100% because it could contain more water than solid material by weight.

Monitor: To watch, keep track of, or check regularly for changes - in this case, to the environment.

Montane: A mountainous region of moist cool upland slopes that occurs below the tree line and is predominately composed of evergreen trees. It is also described as the lower vegetation belt on mountains that is composed of montane plants and animals.

Mosaic Thinning Regimes: A system of thinning to create patches and openings that emulate the structural composition created by a wildfire.

Mosaic Thinning: A style of vegetative thinning that creates openings and patches of vegetation to increase the potential variety of habitat types.

Mycorrhizal: The mutually beneficial relationship between plant roots and fungi “roots,” AKA mycorrhizae, where the fungus receives sugar from the tree while helping the tree with water and nutrient uptake. The majority of plants depend on this relationship.

Natural Disturbance: Disturbances, like fire and floods, which occur in the environment without the intervention of humans.

Natural Place Community: A simple term describing a specific type of ecosystem.
Reference A—Glossary

Natural Range of Conditions: The normal assortment of circumstances under which an organism or group can survive.

Niches: A species or population’s role/function within an ecosystem. Includes resource use, interactions, etc.

Nurse Log: A tree that has fallen, died, and started to decompose. The decaying log is rich in moisture and nutrients and provides a germination spot for plants, as well as habitat for insects.

Obligate Seeder: A plant that reseeds itself after fire as a means of recovery and regeneration.

Obligate Sprouter: A plant that resprouts after fires as a means of recovery and regeneration.

Offshore Flow: The flow of wind blowing from the land to the water, or in other words wind blowing offshore.

One-Way Transport Route: A hauling trail used during tree extraction activities where one entry pass is made.

Overstory Trees: Trees that form the uppermost layer of the canopy in a forest.

Understory: The topmost trees in a forest which compose the upper canopy layer; compared to the understory, which is the lower woody or herbaceous layer underneath treetops.

Patch Burning: A method of prescribed burning where patches are burnt to prepare an area for planting or to form an obstruction to future fires.

Patch Under-Burns: A designated area, or vegetation patch, where fire is utilized to consume surface fuels but not trees and shrubs.

Patch-Retention Thinning: A silvicultural thinning practice where patches of trees and vegetation are retained in a given area while other parts of the treatment area are thinned (selectively cut) at intermediate levels.

Perennial Stream: A stream or watercourse that has water all year round.

Perennial: In reference to water, a stream that holds water year-round during a typical year. May have some flux in a drought year.

Permeability: Where fire can spread through a community with minimal negative impact.

Pilot Ignition Piles: Small piles of primarily small fine fuels such as branches and dead materials organic matter.

Pistol Butts: Trees within a forest stand that have a crooked sweep beginning at the base of the tree, then growing straight toward the sky. A “pistol butt” tree indicates erosive soil movement on the slopes of a particular area.

Plant Community: A group of plants that are interrelated and occupy a given area.

Plant Succession: In ecology, progressive change of the plant and animal life of an area.

Pole-Sized: Generally younger trees with a trunk diameter between four and eight inches.

Precautionary Principle: A concept that promotes a cautious approach to development and managing the environment when information is uncertain or unreliable. Erring on the side of caution and conservation is encouraged, along with a “Better safe than sorry” attitude.

Prescribed Fire: A forest management practice that uses fire to improve habitat or reduce hazardous fuels. A plan for the prescribed burn must be written out and approved, and specific requirements must be met.

Present Condition: The conditions that occur on a property at the present time.

Productive: A term used for land or forests that are growing efficiently and in a vigorous manner.
Reference A—Glossary

**Pump Chance**: An area where water can be pumped from a pond or creek for fire-suppression purposes.

**Rate of Spread**: The speed of an advancing fire. May be measured by the growth in area or by the speed of the leading edge of the fire.

**Regeneration**: The renewal of trees or forests by planting seedlings or direct seeding by humans, wind, birds, or animals after large disturbances like fire. “Regeneration” also refers to the young trees that were naturally seeded or planted.

**Registered Professional Forester (RPF)**: A person licensed in California to manage state or private forestlands and advise landowners on management of their forests. For more information, see: [www.bof.fire.ca.gov/licensing/licensing_current_docs.aspx](http://www.bof.fire.ca.gov/licensing/licensing_current_docs.aspx).

**Release**: Using thinning techniques to free a tree or group of trees from competition for nutrients, sunlight, and water by removing the competing small trees and shrubs.

**Repeating Skips and Gaps**: The forest structure throughout a treatment area following a variable density treatment where some areas are retained and not thinned (skips) and other portions of the stand are heavily harvested (gaps). The range of size of the skips and gaps are from a few hundred square feet to up to an acre where site conditions dictate.

**Residence Time**: How long the flaming front burns in any one location.

**Resilient, Resiliency**: The ability of an ecosystem to return to its balanced state after a disturbance.

**Retention Patch**: A clump of vegetation that has been isolated from contiguous fuels and retained for wildlife habitat and/or native plant species diversity.

**Rhizome**: An underground stem that has the ability to send out roots and shoots. Grasses and irises are two plants that exhibit rhizomes.

**Riparian**: A strip of land along the bank of a natural freshwater stream, river, creek, or lake that provides vast diversity, and productivity of plants and animals.

**Salvage Logging**: Logging and removing merchantable trees after a fire to capture economic potential. This is a very controversial subject.

**Saturated**: The broad meaning is “full.” Saturated soil refers to the point at which the soil is so full of water that no more water can get into (be absorbed by) the soil, and therefore must run off.

**Scalping**: The act of removing the surface layer to expose the bare mineral soil.

**Scratch Line**: An incomplete control line in beginning stages that is constructed as an emergency backup for spreading fires.

**Sediment**: Particles of topsoil, sand, and minerals that come from soil erosion or decomposing plants and animals. Wind, water, and ice carry these particles; when the sediment collects in waterways it can destroy fish and wildlife habitat.

**Seed Bank**: A repository of dormant seeds found buried in the soil.

**Seep**: An area where water rises from an underground source to the surface and creates a wet area.

**Sensitive Species**: A plant or animal species that can tolerate a small range of resources and environmental situations. These species raise concerns about population numbers and may be recognized locally as rare.

**Shade Tolerant**: Attribute of a species that is able to grow and mature normally in and/or prefers shaded areas.
Reference A—Glossary

**Shaded Fuelbreaks**: A fire-suppression technique using fuelbreaks in forested areas. Vegetation is reduced and/or modified to reduce fire risk, but an adequate amount of crown canopy remains intact, thus inhibiting weedy undergrowth.

**Shaded**: Blocked from light with shade or shadows.

**Shape**: The act of pruning a tree to a desired form or appearance.

**Sheltered Connectivity**: Contiguous areas within a thinning treatment that are retained for wildlife cover and to support wildlife movement.

**Silvicultural**: The practice of caring for forest trees in a way that meets management objectives. For example, foresters may control the composition and quality of a forest stand for goods such as timber and/or benefits to an ecosystem.

**Site Specific**: Applicable to a specific piece of land and its associated attributes and conditions (e.g. microclimate, soils, vegetation).

**Size Class**: The division of trees by the size of their diameter, sometimes split into three categories—seedlings, pole, and saw timber—or by diameter in inches.

**Slash Paper**: Paper used to cover slash piles before ignition with the intention of keeping the slash dry or allowing it to dry. Paper is more environmentally appropriate than plastic.

**Slash**: The wood debris left on the ground after pruning, thinning, or brushing—may include branches, bark, chips, or logs.

**Slope Stability**: The degree to which a slope is susceptible to erosion and slides, or the measure of how stable a slope is.

**Slope**: A percentage or degree change in elevation over a defined distance that measures the steepness of a landscape.

**Snag**: A standing dead tree that has usually lost most of its branches. Snags offer essential food and cover for a host of wildlife species.

**Soil Type**: Refers to the different combinations of soil particles and soil composition. Soil can vary greatly within short distances.

**Spatial Distribution**: The manner in which plants are arranged throughout an area.

**Spot Fire**: A smaller fire outside the boundary of the main fire, started by airborne sparks or embers.

**Spur**: A road branching off the main road to provide access to a designated area.

**Stacking Function**: The act of accomplishing several goals with one activity.

**Stand Structure Model**: The spatial arrangement of the forest stand, describing the density and connectivity of the understory, mid-story, and overstory vegetation.

**Stand**: A group of trees with similar species composition, age, and condition that makes the group distinguishable from other trees in the area.

**Steady State Climax**: The stage of vegetation that is self-sustained without disturbance.

**Stem and Poles**: The trunk of a tree or a piece of wood that is long and slender.

**Stemwood**: The wood of the main stem or trunk of a plant

**Stocking Levels**: The density and calculation of tree seedlings, saplings, and poles in a given area.

**Strip Patch**: In prescribed burning, a narrow section or area where the fuel is burnt while the surrounding area is left untreated.

**Structural Protection Zone**: Immediate thirty-foot buffer zone around the home.
Reference A—Glossary

Structure: The composition of a forest or vegetation, specifically looking at the density, cover, size or diameter, and arrangement.

Stump-Sprout: The ability of a tree to resprout from its cut stump.

Submerchantable: Trees that cannot be sold for timber products due to disease, deformities and/or size.

Surface Fire: A fire on the forest floor that consumes debris and smaller plants.

Surface Fuels: Materials on the ground like needles or low-growing shrubs that provide the fuel for fires to spread on the ground. Surface fuels are generally considered all fuels within six feet of the ground.

Surface or Crown: The distinguished location that a fire burns. Surface refers to the forest floor while crown refers to fires in the top of trees.

Suspended Dead Material: Typically composed of pine needles that are draped on living brush. Made up of dead fuels not in direct contact with the ground, consisting mainly of dead needles, foliage, twigs, branches, stems, bark, vines, moss, and high brush. In general, these fuels easily dry out and can carry surface fires into the canopy.

Swamper Burning: A method of prescribed fire where fuel is added gradually and continually to a burning pile over the course of a day.

Thermal Cover: Vegetation cover that modifies unfavorable affects of weather for animals. For example, elk may move to a fir forest with trees at least 40 feet tall and a crown closure of 70% to protect themselves from bad weather.

Thicket: A thick area of brush containing close-growing plants. Provides habitat to wildlife but may be difficult for humans to pass through.

Thinning Away Contiguous Fuels: The practice of cutting back fuel loads from the edge of a desired leave-tree or patch in an effort to separate fuel connectivity.

Thinning From Below: Silvicultural practice where smaller understory trees are selectively removed below overstory trees. This method is also called “low thinning.”

Tillering: The process by which these new aerial shoots emerge from the base of the plant.

Tip Sprout: The ability of a shrub to resprout from a cut limb.

Torching: A rapid and intense burning of a single or small group of trees/shrubs, causing the upward movement of fire; a.k.a. crown fire initiation or flare-up.

Touch-Off: A prescribed fire operation performed by a forestry or fire crew where large quantities of forest treatment slash that are arranged in hand piles are ignited with drip torches at one time by multiple crew members.

Treatment: An action or controlled technique that is applied in a specific process. Refer to “Fuel Treatment” for a more specific definition.

Underburn: A prescribed fire method where burning is conducted in the understory of the forest below the dominant trees.

Understory: Generally herbaceous or shrubby vegetation that makes up the layer of forest under the tree canopy layer.

Uneven-Aged Treatment: A treatment that deals with three or more age-classes of trees.

Unstable: Land that is lacking stability, or liable to change with activity, such as in the case of steep slopes or crumby soils.

Untreated: Not altered from a natural or original state; unprocessed, e.g. no fuel reduction or defensible space activities.
Reference A—Glossary

Variable-Density Thinning: Thinning or selectively cutting trees in a manner to restore repeating variability or redundancy in a forest. This technique ensures diversity in stand density and canopy cover.

Variable-Density Treatments: Silvicultural thinning practice where some portions of a stand are left lightly or completely unthinned (“skips”), providing areas with high stem density, heavy shade, and freedom from disturbance; while other parts of the stand are heavily cut (“gaps”), including removal of some dominant trees to provide more light for subdominant trees and understory plants. Intermediate levels of thinning are also applied in a typical variable-density prescription. This practice is also known as “free thinning.”

Vertical and Horizontal Structure Diversity: Describes the configuration of trees within a forest stand that create a variation of structure where trees stand straight up and down (vertical) or grow at an angle (horizontal).

Vertical Fuels: Those fuels (brush, small trees, decks, etc.) that provide a continuous layer of fuels from the ground up into the top fuel layers (i.e. tree canopy).

Watershed: All of the land that drains water runoff into a specific body of water. Watersheds may be referred to as drainage areas or drainage basins. Ridges of higher elevation usually form the boundaries between watersheds by directing the water to one side of the ridge or the other. The water then flows to the low point of the watershed.

Weed Eater: A hand-held tool that utilizes a gas or electric motor and a rotating nylon string or metal blade to cut down vegetation.

Wick: A combustible material that allows fire to travel along a confined path to larger fuel sources. An example would be a wooden fence connected to your home.

Wildlands: An area of land that is uncultivated and relatively free of human interference. Plants and animals exist in a natural state, thus wildlands help to maintain biodiversity and to preserve other natural values.

Windthrow: Trees that are uprooted by wind events. May occur in logged areas or in stands of shallow-rooted trees such as white pines. Formerly protected stands whose edges are opened up become vulnerable to this effect.

WUI: Wildland Urban Interface, the area where wildlands and communities converge, often assumed to be at high risk of wildfire.

Yarding: A technique for moving felled trees, limbs, and brush by hauling them to the road with a cable and tractor.
Reference B – Internet Links for Further Information

**GENERAL INTEREST WEBSITES**
cafirealliance.org/cwpp/, California Fire Alliance, CWPPs.
fire.ca.gov/education.php, CAL FIRE, Fire Safety Education.
www.cafirealliance.org, California Fire Alliance homepage.
www.fire.ca.gov/education_homeowner.php, California Department of Forestry and Fire Protection (CAL FIRE), Homeowner’s Responsibility.
www.firesafecouncil.org, California Fire Safe Council homepage.
www.firewise.org, Firewise homepage.
www.firewise.org/resources/homeowner.htm, Firewise Homeowners Resources.
www.wildfireprograms.usda.gov, National Wildfire Programs Database, provides information about policies and programs that seek to reduce the risk of loss of life and property through the reduction of hazardous fuels on private lands.

**APPENDICES**

1. **MIDPINES COMMUNITY CONSERVATION AND WILDFIRE PROTECTION PLAN INTRODUCTION**

1.4. **Introduction to Midpines, California**

1.5. **Midpines Communities at Risk**
cafirealliance.org/communities_at_risk/, California Fire Alliance, “Communities at Risk.”

1.7. **Introduction to Mariposa County Fire Safe Council**
www.dneco.org/downloads/DNFSPFinal.pdf, Del Norte Fire Safe Plan, see section 1.5 for example of text.

2. **MIDPINES FIRE SAFE PLANNING PROCESS**

2.1. **Planning Area Boundaries**
cwp.resources.ca.gov/browser/, California Watershed Portal, searchable by subregion.
mattole.org/pdf/UMFP_final.pdf, Upper Mattole Fire Plan, an example of neighborhood-level planning.
wildfire.cr.usgs.gov/fireplanning/, Fire Planning and Mapping Tools.

2.2. **Process and Plan Development**
jsfp.fortlewis.edu/collaboration2.asp, Joint Fire Sciences, “Enhancing Community Collaboration and Building Community Capacity.”

3. **WILDFIRE: CURRENT ENVIRONMENT AND BEHAVIOR**
Reference B – Internet Links for Further Information

www.lomakatsi.org/ A great example of a group doing fire hazard reduction work while improving basic watershed and ecosystem function in southern Oregon. They have created a list of ecological principles to use in implementing fuel reduction projects.

3.1. Introduction: Defining the Wildfire Problem

3.2. Fire Behavior Characteristics
fire.boi.noaa.gov. The National Fire Weather website on fire weather.
raws.wr noaa.gov/cgi-bin/roman/past.cgi. University of Utah, Mountain Meteorology Group. One of the best fire weather data sources.

3.3. General Wildfire Environmental Description
cdec.water.ca.gov/snow_rain.html. Information on precipitation and snow levels in California.
cwp.resources.ca.gov/browser/. Watershed information.
jfsp.nfpc.gov/projects/01B-3-3-28/01B-3-3-28_Final_Report.pdf. Fire Effects on Rare Flora and Fauna in Southern California National Forests.
plasma.nationalgeographic.com/mapmachine/. National Geographic satellite maps, street maps, theme maps and more.
water.usgs.gov/waterwatch/?m=real&w=map&r=ca. USGS Water Watch site.
watersupplyconditions.water.ca.gov/. California Department of Water Resources “Drought Preparedness.”
watersupplyconditions.water.ca.gov/hydrologic.cfm. Department of Water Resources “Hydrologic and Water Supply Conditions.”
www.calflora.org/. Information on wild California plants.
www.fs.fed.us/database/feis/, Information on how wildfire affects specific wildlife species.
Reference B – Internet Links for Further Information

www.topozone.com/. Interactive topographic maps, orthophoto maps, and aerial photos of the entire US.
www.water.ca.gov/. CA Department of Water Resources.
www.water.ca.gov/nat CfM?_topic=Water_Conditions&subtopic=Water_Conditions_and_Forecasts. CA Department of Water Resources, river conditions and forecasts.
www.wrcc.dri.edu/summary/Climsmnca.html. Western Regional Climate Center, California climate information.

3.4. Fuel: Description of Fuel Through Fuel Models
gisdata.usgs.net/website/landfire/. Fuel models mapped by the USGS Landfire program.

3.5. Fire History
frap.cdf.ca.gov/projects/fire_data/fire_perimeters/. CAL FIRE FRAP fire history from fire perimeters.
www.ceres.ca.gov/snap/pubs/web/v1/ch04/v1_ch04_03.html. Sierra Nevada Ecosystem Project, Effects of Human Activity Beginning in the Mid-1800s.

3.6. Fire Hazard
frap.cdf.ca.gov/data/fire_data/fuel_rank/index.html. FRAP Fuel Rank Maps and Data.
frap.cdf.ca.gov/data/fire_data/fuels/fuelsfr.html. FRAP surface fuels maps and data.
frap.cdf.ca.gov/data/fire_data/hazard/mainframes.html. FRAP Hazard Maps and Data.
www.fs.fed.us/fire/fuelman/. USFS, spatial data for wildland fires and fuel management.

3.7. Fire Regime
gisdata.usgs.net/website/landfire/. USGS Landfire, Fire Regime Condition Class data throughout Sierra Nevada.

3.8. Fire Threat
frap.cdf.ca.gov/data/frapgismaps/output/fthreat_map.txt. FRAP fire threat data.

3.9. Changing Fuels in the Wildland Urban Interface

4. Fire Ecology and Management of Sierra Nevada Vegetation Types
www.fire.ca.gov/rsrc-mgt_pestmanagement_socalbeetle.php. CAL FIRE, Information on Southern California beetle infestation and integrated pest management.
www.fire-ecology.org/. Western Fire Ecology Center, fire ecology research in Sierra Nevada forests, the California shrublands, and the Mojave and Sonoran deserts.
Reference B – Internet Links for Further Information

www.lomakatsi.org, Lomakatsi Forest Restoration.
www.werc.usgs.gov/fire/, USGS Western Ecological Research Center.

5. MIDPINES COMMUNITY FEATURES

www.grayback.com/applegate%2Dvalley/fireplan/, The Applegate (Oregon) Fire Plan: Balancing Act, Living with Fire in the Applegate, Chapter II is a great example of a community description.
yosemitewest.org/wfa50225.htm, The Draft Yosemite West CWPP; a simple but effective approach to writing this section.

5.1. Social and Political Setting

gis.ca.gov/, California Spatial Information Library (CaSIL).
www.assembly.ca.gov/acs/defaulttext.asp, Assembly member information, and maps of districts.
www.census.gov/, Local planning and tourism departments, US census data.
www.ceres.ca.gov/org/edu/list.html, A comprehensive list of educational institutions, Schools by type.
www.leginfo.ca.gov/, State of California official legislative information website, to get background and/or updates on any relevant legislation.
www.my.ca.gov/state/portal/myca_homepage.jsp, State agencies’ public information on current fires and fire conditions.
www.senate.gov/, State senator information and district maps.

5.2. Public, Tribal, and Industrial Lands Fire Management

www.fs.fed.us/r5/, US Forest Service, California.
www.nps.gov/, National Park Service.

5.3. Community Planning Context

www.ceres.ca.gov/planning/, LUPIN, California Land Use Planning Information Network.
www.ceres.ca.gov/planning/countylists/county_gov.html, LUPIN County and City Governments by County.
www.communityviz.com/, “CommunityViz is advanced yet easy-to-use GIS software designed to help people visualize, analyze, and communicate about important land-use decisions.”
6. FIRE PROTECTION ORGANIZATIONS
www.calchiefs.org, California tribal fire chief association.

6.2. California Department of Forestry and Fire Protection (CAL FIRE)
www.fire.ca.gov/ CAL FIRE’s homepage.

6.3. Federal Fire Agencies
www.fs.fed.us/r5/, US Forest Service, California.

7. RISK ASSESSMENT: IDENTIFYING AND EVALUATING ASSETS AT RISK
cdfdata.fire.ca.gov/fire_erp/fpp_planning_cafireplan, Introductory and background information on assets at risk, California Fire Plan, Chapter 4: Assets at Risk, and Appendix C: Assets at Risk and their Role in the Fire Plan.

7.1. Assets at Risk in Your Planning Area
cwp.resources.ca.gov/browser/, California Watershed Portal, watershed information.
www.arb.ca.gov/spd/district/adstat.htm, Air Districts Program Approval Status.
www.arb.ca.gov/spd/district/district.htm, Air Resource Board, Smoke Management Programs.
www.arb.ca.gov/spd/spm.htm, California Air Resources Board.
www.ca.nrcs.usda.gov/, Natural Resource Conservation Service (NRCS), California.
www.calcattlemen.org/, California Cattlemen’s Association.
www.californiahistoricalsociety.org/programs/ced.html, California historical Society, cultural directory page.
www.carcd.org/frameset.htm, California Association of Resource Conservation Districts. Allows you to contact any local conservation organizations to inquire about other groups in the area who may be addressing fire-related issues.
www.consrv.ca.gov, CA Dept. of Conservation.
www.dfg.ca.gov/whdb/html/enddb.html, CA Department of Fish and Game (DFG) Natural Diversity Database.
www.dfg.ca.gov/whdb/index.html, DFG Wildlife and Habitat Data Analysis Branch.
www.dwr.water.ca.gov/, CA Department of Water Resources.
www.epa.gov/airnow/, For US Environmental Protection Agency, air quality information PA.
www.fb.com, Farm Bureau.
www/firesafecouncil.org/ca/attachments/OSB_FSC.doc, A great Orleans-Somes Bar Fire Safe Council survey to get information from local residents on local fire conditions.
www.kryfiresafecouncil.com/, For a more complex, GIS-based assessment, see the Kern River Valley Fire Safe Plan, p. 20.
www.kstrom.net/isk/maps/ca/california.html, Map of federally recognized tribes, list and contact information for California tribes and other useful maps.
Reference B – Internet Links for Further Information

www.tuolumnefiresafe.org/fire_tuo_county_cwpp.html, An example of a simple approach to identifying and evaluating assets at risk, Tuolumne County CWPP, p. 18.

7.2. Assessing Risks in the Planning Area
firecenter.berkeley.edu/toolkit/, Fire Information Toolkit analysis.
gis.ca.gov/, California Spatial Information Library.
mattole.org/pdf/UMFP_final.pdf, Upper Mattole Fire Plan, an example of neighborhood planning areas.
www.edcfiresafe.org/edc_wildfire_protection/appendix_c.htm, El Dorado County CWPP, South Fork American River assessment.
www.tuolumnefiresafe.org/fire_tuo_county_cwpp.html, Tuolumne County CWPP, p. 44.

8. MEETING YOUR OBJECTIVES: MIDPINES FIRE SAFE ACTION PLAN

8.3. Existing Projects and Actions
www.fs.fed.us/r5/, US Forest Service, California.
www.nps.gov/, National Park Service.

8.4. Proposed Actions
frape.cdf.ca.gov/projects/wui/, FRAP WUI map.
groups.ucanr.org/HWMG/Garage_Doors/, University of California information on “Garages.”
groups.ucanr.org/HWMG/roof/, University of California information on “Roofs and Gutters.”
groups.ucanr.org/HWMG/vents/, University of California information on “Vents.”
http://www.citizencorps.gov/cert/, Information on starting a Community Emergency Response Team or CERT.
nature.berkeley.edu/7Effbeall/firemit.html, Fire mitigation information from UC Berkeley.
osfm.fire.ca.gov/bmllisting.html, CA Fire Marshal, “Building Materials Listing Program.”
Reference B - Internet Links for Further Information

osfm.fire.ca.gov/WUIBS.html, Office of the State Fire Marshal Wildland Urban Interface (WUI) Building Standards Development
outreach.cof.orsst.edu/resilientfire/finney.htm, Presentation by Mark Finney on creating fire resilient landscapes.
training.fema.gov/EMIWeb/cert/dir.asp, List of Existing CERT Programs by State.
www.co.larimer.co.us/wildfire/access.pdf, Firefighter access.
www.co.larimer.co.us/wildfire/fwcroofing.pdf, Detailed page on fire-safe roofing materials, e.g. metal roofs.
www.fire.ca.gov/rsre-mgt_prop40.php, Proposition 40 Fuels Reduction Program
www.firelab.org/index.php?option=com_content&task=view&id=43&Itemid=82, Missoula Fire Sciences Lab, Mark Finney.
www.fs.fed.us/psw/biomass2energy/overview.shtml, USFS research to support biomass projects.
www.fs.fed.us/ssp7, US Forest Service State and Private Forestry page providing information about cost-share programs and other programs to support private forestland owners.
www.livingwithfire.info/beforethefire/accesszone/index.php, Diagram of home with proper access zones for entry into and out of rural properties.
www.redcross.org/services/disaster/01082_0_6_00.html, Red Cross, how to create an evacuation plan.
www.redcross.org/services/disaster/01082_0_601_00.html, Red Cross, how to do family disaster planning.
www.redcross.org/services/disaster/beprepared/animalsafety.html, Red Cross, how to prepare for your pets for emergencies.

9. FACILITATING MIDPINES FIRE SAFETY IN THE LONG TERM
www.co.josephine.or.us/SectionIndex.asp?SectionID=158, Josephine County Integrated Fire Plan. Chapter 10.

9.1. Monitoring
www.edcfiresafe.org/documents/ed_nv_mpp_appendix_m_2006-08-23.pdf, El Dorado County FSC example matrix for tracking projects.
www.fs.fed.us/pnw/pubs/gtr526/, PNW research stations photo point monitoring handbook, a great site for monitoring.
www.lcri.org/monitoring/, Information about from Chewaucan biophysical monitoring project.
Reference B – Internet Links for Further Information


9.4. Resources Needed to Support Ongoing Efforts

CONSERVATION AND WILDFIRE BACKGROUND MATERIALS

BACKGROUND A – CONSERVATION PRINCIPLES FOR COMMUNITY WILDFIRE PROTECTION IN CALIFORNIA’S SIERRA NEVADA

cetulomme.ucdavis.edu/newsletterfiles/Master_Gardener_Articles_20044858.doc, “Create a Wildlife-Friendly Yard.”

ewp.uoregon.edu/programs.html, Ecosystem Workforce Program.
firecenter.berkeley.edu/toolkit/homeowners.html, Fire Information Engine Toolkit.
firewise.org/resources/homeowner.htm, Firewise Resources – For The Homeowner.
groups.ucanr.org/HWMG/index.efm, University of California Homeowner’s Wildfire Mitigation Guide
www.audubon.org/bird/at_home/Explore.html, What is Your Ecological Address?
www.bcwildfire.ca/, Protection Branch.
www.cnrs.uidaho.edu/extforest/AfterTheBurnFINAL.pdf, Assessing and Monitoring: Your Forestland After a wildfire.
www.dfg.ca.gov/hcpg/species/t_e_spp/tespp.shtml, CA DFG Threatened and Endangered Species Program.
www.eri.nau.edu/cms/content/view/544/740/, Protecting Old Growth.
www.ext.colostate.edu/PUBS/NATRES/06308.html, Soil Erosion Control after Wildfire.
www.fire.ca.gov/about_content/downloads/Evacuation2006.pdf, CAL FIRE Evacuation
www.fire.ca.gov/education_100foot.php, CAL FIRE 100 Feet of Defensible Space is the Law.
Reference B – Internet Links for Further Information

www.fire.ca.gov/index.php, CAL FIRE.
www.fs.fed.us/psw/rl/projects/wild/verner/psw_37.html, California Wildfire and Their Habitats; Western Sierra Nevada.
www.laspiitas.com/classes/fire_burn_times.html, California Plants and Fire.
www.paws.org/about/emailnetwork/archive/wildagain/wild_2004_06_02.html, PAWS Conservation Program newsletter article, “Wild Again.”
www.projecttahs.org/pdf/firedepartment.doc, Working with your Local Fire Department.

BACKGROUND B – WILDLAND FIRE SAFETY AT HOME
firecenter.berkeley.edu/toolkit/homeowners.html, Tools for homeowners.
osfm.fire.ca.gov/fire safeplanning.html, Fire Safe Planning Program.
www.uri.edu/ee/healthylandscapes/tips/6.html, Healthy Landscapes, reducing soil erosion.

B.1. Before the Fire
cdfdata.fire.ca.gov/pub/fireplan/upload/wpgrundepdf99.pdf, Structural fire prevention field guide.
cecontracosta.ucdavis.edu/Wood%5FDurability/, Wood durability program.
firecenter.berkeley.edu/square/squarel.htm, Information on wood products subjected to wildfires.
groups.ucanr.org/HWMG/index.cfm, University of California’s Homeowners Wildfire Mitigation Guide.
nature.berkeley.edu/~fbeall/firemit.html, Frank Beall, UC Berkeley Fire Mitigation, excellent reference site.
osfm.fire.ca.gov/bmllisting.html, “Building Materials Listing Program.”
osfm.fire.ca.gov/structural.html, Structural fire prevention field guide.
www.audubon.org/bird/at_home/SafeMisc.html, Audubon Society information on how to keep wildlife safe on your property.
www.bhtank.com/fire_water.asp, Information on fire safety water storage solutions.
www.blueprintforsafety.org/wildfire/wfintro.aspx, Blue Print for Safety provides information on wildfire safety.
Reference B – Internet Links for Further Information

www.bof.fire.ca.gov/pdfs/Copyof4291finalguidelines9_29_06.pdf California Board of Forestry.
www.bof.fire.ca.gov/pdfs/DefensibleSpaceRegulationsfinal12992_17_06.pdf. Board of Forestry
defensible space guidelines.
www.cdc.gov/hasd/docs/d000801-d000900/d000896/d000896.html. NASD information on creating fire
safe zones around your home.
www.ceres.ca.gov/foreststeward/html/tensimple.html. “10 simple things you can do to increase your fire
safety.”
www.co.larimer.co.us/wildfire/access.pdf. Information on firefighters accessing your home with ease in
fire prone areas.
www.co.larimer.co.us/wildfire/prepared_for_wildfire/sld001.htm. Be Prepared for Wildfire, information
on firescapes, firewise construction, etc. Note: Information from Colorado State Forest Service but
customs still apply in California.
www.co.larimer.co.us/wildfire/water_supply.pdf. Information on making your water supply accessible
in emergencies.
www.dnr.state.mn.us/firewise/50things.html. List of 50 Firewise things you can do to protect your
home, range from no cost to high cost actions.
www.edcfiresafe.org/fire_safe_vegetation.htm El Dorado County Fire Safe Council, Resistant
Landscape.
www.fire.ca.gov/education_100foot.php. Information on the 100-foot defensible space law.
www.fire.ca.gov/education_bumpermits.php. CAL FIRE Burn Permit information by county.
www.firesafecouncil.org/education/checklist.cfm. A homeowner’s checklist of fire-safe practices inside
and outside your home.
www.firesafecouncil.org/education/questionnaire/index.html. An interactive website offering a brief test
to see if your house is fire safe. Note: CA regulations have changed the 30-foot defensible space
minimum to 100 feet.
www.leginfo.ca.gov/cgi-bin/waisgate?WaisdocID=32907529051+0+0+0&WaisSection=retrieve. PRC
4291.
www.leginfo.ca.gov/cgi-bin/waisgate?WaisdocID=32917929386+0+0+0&WaisSection=retrieve PRC
4290.
www.livingwithfire.info/beforethefire/accesszone/index.php. Diagram of home with proper access zones
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Reference B – Internet Links for Further Information

www.oasidisdesign.net/greywater/. Information on greywater and its uses.
www.pioneertanks.com, Australian made water storage tanks.
www.sierraclub.org/forests/fires/home_fire_safety.pdf, Sierra Club tips to protect your home from wildland fires.
www.westernshastarcd.org/FireSafe.htm, Information from Shasta County on how to make your home more fire safe.

B.2. During the Fire

pnwfireprevention.com/LWF/Livingwithfire.pdf, Pacific Northwest Wildfire Consulting Group, Living with Fire, When Wildfire Approaches Checklist
redcross.org/services/disaster/keepsafe/wildfire.html, Information on wildfires by Red Cross.
training.fema.gov/emiweb/IS/is11.asp, “Animals in Disaster: Community Planning.”
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www.edf.ca.gov/ahfss/ah/disaster_prep_Brochures.htm, Information on birds, domestic pets, horses, and livestock.
www.nicsinfo.org/SIP%20Center.htm, Shelter in place information.
www.oes.ca.gov/Operational/OESHome.nsf/1/OpenForm, Governor’s Office of Emergency Services.
www.preparenow.org, Prepare Now, “Supporting the needs of vulnerable people in disaster preparedness and response.
www.redcross.org/services/disaster/beprepared/animalsafety.html, Information on “Pets and Disaster: Be Prepared.”
www.redcross.org/services/disaster/beprepared/evacuation.html, Information on evacuation plans by Red Cross.
www.redcross.org/static/file_cont258_lang0_123.pdf, Red Cross, “Are You Prepared?”

B.3. After the Fire

earth.google.com/ Google Earth, use satellite imagery to explore places on the earth.
Reference B – Internet Links for Further Information

www.cnrl.uidaho.edu/extforest/AftertheBurnFINAL.pdf. After the Burn; Assessing and Managing Your Forestland After a Wildfire.


www.redcross.org/services/disaster/0.1082.0_578_00.html. “What to do after a wildfire.”

Background C – Wildland Fuel Hazard Reduction

C.1. What is Ecological Fuel Reduction?


cb.humboldt.ca.us/planning/fire_safe_council/local_fsc/orleans/STATEFSC.PPT. Orleans Somes Bar Fire Safe Council, presentation on integrating fire safety and ecological fuels treatments.

cb.humboldt.ca.us/planning/fire_safe_council/local_fsc/orleans/STATEFSC.PPT. The Orleans-Somes Bar Fire Safe Council is a great example of an FSC doing ecologically based fuel reduction.


www.ceres.ca.gov/foreststeward/html/protectforest.html. “Protect your forest from wildfire.”


www.lomakatsi.org/. Includes a list of ecological principles to use in implementing fuel reduction projects.
Reference B – Internet Links for Further Information


C.2. What to Do with Thinned Materials
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sustainablehardwoods.net/, Sustainable Hardwoods Network.
www.arb.ca.gov/capcoa/dismap.htm?362,53, Find out to which Air Quality Management District your community belongs to.
www.arb.ca.gov/smp/district/adstat.htm, For air district program approval status.
www.arb.ca.gov/smp/district/district.htm, For local air district.
www.arb.ca.gov/smp/smp.htm, Air Resource Board, Smoke Management Program.
www.fire.ca.gov/about_content/downloads/DebrisBurning2006copy.pdf CAL FIRE Debris Burning Guidelines
www.fire.ca.gov/education_burnpermits.php, CAL FIRE Burn Permit information by county.
www.fs.fed.us/psw/biomass2energy/overview.shtml, USFS research to support biomass projects.
www.fuelsforschools.org/, Fuels for schools and beyond.
www.fungi.com/kits/index.html Utilize the chips in creative ways like creating your own mushroom patch.
www.fungi.com/kits/outdoor.html, Outdoor mushroom patches that can turn your dry chips into fertile soil and a tasty snack!
www.grayback.com/applegate-valley/fireplan, Applegate Fire Plan, “What you should know before burning debris or slash.”
www.lomakatsi.org/ Lomakatsi, information on burning and ecological fuels treatments.

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firesafecouncil.org/education/attachments/Homeownerchecklist.pdf, California Fire Safe Council (CFSC) Homeowner’s Checklist
firesafecouncil.org/education/attachments/landscapinggrassland.pdf, CFSC Landscaping Guides: Grassland.
groups.ucanr.org/WMG/index.cfm, Homeowner’s Wildfire Mitigation Guide.
osfm.fire.ca.gov/pdf/regulations/summareofwuicodes.pdf, Summary of California WUI Codes.
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www.bof.fire.ca.gov/pdfs/AB242010_28_05.pdf, Board of Forestry, Forest Fire Prevention Exemption Language.

www.bof.fire.ca.gov/pdfs/Copyof4291finalguidelines9_29_06.pdf, Board of Forestry Defensible Space Guidelines.

www.edcfiresafe.org/documents/edc_firesafe_news_spring_2006.pdf, EL Dorado County Fire Safe Council, Air Quality Burning Regulations

www.edcfiresafe.org/fire_safe_vegetation.htm EL Dorado County Fire Safe Council, Fire Resistant Landscape.


www.fire.ca.gov/education_100foot.php, CAL FIRE, Why 100 Feet?


www.fire.ca.gov/education_homeowner.php, California Department of Forestry and Fire Protection (CAL FIRE), Homeowner’s Responsibility.

www.firewise.org/resources/homeowner.htm, Firewise Homeowners Resources.

www.loginfo.ca.gov/cgi-bin/waisgate?W AISdocID=4051777136+0+0+0&W AISaction=retrieve, PRC 4290

www.loginfo.ca.gov/cgi-bin/waisgate?W AISdocID=4052207349+0+0+0&W AISaction=retrieve, PRC 4291

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Conservation Principles for Community Wildfire Protection in California’s Sierra Nevada

“Fire always has been and always will be an ecological force in the Sierra Nevada. Decades of fire suppression have changed this role, allowing stands to thicken and fuels to accumulate, especially in the foothills and lower montane zone, where developments are increasing. We either manage fire and live with fire on our terms or let fire dictate the terms. The choice is ours.”

— Jan W. van Wagendonk, Wildfire (2006)

Most Sierra Nevada residents choose to live here because of the natural beauty. What many of us don’t realize is that living within these forests and wildlands carries a responsibility. We need to be good stewards of the land, learning to live in balance with the natural world, of which fire is a significant part. This document summarizes what residents can do to coexist with fire in the Sierra. It will show you how to provide a positive balance among fire prevention, conservation, and wildlife protection at your Sierra Nevada home. You’ve chosen to live here, and with your choice comes a stewardship responsibility.

For more information on fire safety in general, please contact your local Fire Safe Council, or go to
www.fire.ca.gov/education_homeowner.php
www.firesafecouncil.org/homeowner/index.cfm
firewise.org/resources/homeowner.htm

Some Basic Concepts to Remember for Living with Fire in the Sierra Nevada

- **Fire is a dynamic element of the Sierra.** Your property has likely burned before and will burn again. The landscape where you live today may seem “natural.” In fact it has changed drastically over the last 150 years as we have attempted to manage fire. In preparing your property for fire, you can help restore it to a more ecologically appropriate state. In doing so, you will learn how to be prepared for wildfire—it is not only possible, it’s smart. While it is rarely practical to completely “fire proof” your property, there are many steps you can take to survive inevitable wildfire. For more information see http://www.fire.ca.gov/education_content/downloads/live_w_fire.pdf.

- **One size does not fit all in terms of homeowner fire safety.** Every place is unique. Work with your local Fire Safe Council, fire department, Cooperative Extension Agent, Registered Professional Forester, and/or contractors to design the appropriate fire-safe practices and defensible space for your

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1 Montane: A mountainous region of moist cool upland slopes that occurs below the tree line and is predominantly composed of evergreen trees. It is also described as the lower vegetation belt on mountains that is composed of montane plants and animals.

2 Wildlands: An area of land that is uncultivated and relatively free of human interference. Plants and animals exist in a natural state, thus wildlands help to maintain biodiversity and to preserve other natural values.

3 Fire Prevention: Actions taken by homeowners and community members to lessen wildfires and damage caused by wildfires. Includes education, enforcement, and land management practices.

4 Fire Safe Council: Public and private organizations that comprise a council intended to minimize the potential for wildfire damage to communities and homeowners, while also protecting the health of natural resources. Goals are achieved by distributing fire prevention materials, organizing fire safety programs, implementing fuel reduction projects, and more.

5 Extension Agent: An employee from the government or a university who provides information to rural communities about agriculture, land management and/or resource management. In California, the University of California Cooperative Extension (UCCE) provides this service. For more information on UCCE, see: http://ucanr.org/.

6 Registered Professional Forester (RPF): A person licensed in California to manage state or private forestlands and advise landowners on management of their forests. For more information, see: www.bof.fire.ca.gov/licensing/licensing_current_docs.aspx.

7 Fire Safe Practices: Activities such as creating defensible space, firebreaks, access to your home, fire-resistant landscapes, changes to your home in terms of material and design, etc., that make your home/property safer in wildfire situations.

8 Defensible Space: An area around a home/structure that has been cleared of flammable materials to act as a barrier between wildfires and property, thereby decreasing the risk of damage or loss. This space is now defined as 100 feet around a structure in California.
property. See www.fire.ca.gov/education_100foot.php and www.firesafecouncil.org/homeowner/index.cfm for more information.

- **Your home exists within a larger watershed.** It is located in the midst of a much larger landscape. Think about where your property is on the slope. Are you on top of a ridge, where fire will easily burn toward your home? Is your slope steep or gentle? Fire moves quickly up steeper slopes, which means that you may need to treat a larger area to create your defensible space. What is below and above you? What direction, or “aspect,” does your property face? Generally, south-facing properties are hotter and drier; they can therefore be more susceptible to fire. Are there any natural firebreaks around you such as streams, rivers, or rocky outcrops where a fire might naturally go out? Do wildlife use or move through your property to get to food, shelter, or water? In what watershed are you located? Do the roads in and out of your property follow ridges or rivers? Look beyond your property lines to understand the ecological perspective of your place. See www.audubon.org/bird/at_home/Explore.html for more information.

- **Fire can behave both predictably and unpredictably.** We can generally predict fire direction and behavior; it will go the way the wind is blowing and burn as much fuel as is available. Predicting the exact time and place where fire will burn is less obvious. As fire moves across the landscape it can climb up into your trees. A key fire safety objective is to prevent that spread. Dead leaves and branches on the ground (surface fuels) act as a wick to move fire horizontally across the land. Shrubs, small trees, and live branches (ladder fuels) can carry fire vertically into the larger trees. Too much of these surface and ladder fuels can cause the overstory trees to burn up in what is called a “crown fire”—when fire spreads from tree to tree in the forest canopy (or tree tops). One of the main principles in creating defensible space and reducing hazardous fuel conditions is to create physical space between vegetation layers (both vertically and horizontally) so a fire cannot climb easily from the ground into the trees or to your home. See www.fore.gov.bc.ca/protectsuppression/behaviour.html#Behaviour for more information.

- **Timing is everything.** There are appropriate times for different actions on your property, much as there are different seasons of work in your garden. Do your defensible space and fuel reduction work well before fire season, to avoid having sparks from equipment start fires in dry vegetation. Avoid ground-disturbing activities in your forest or wildland when the ground is too wet or when birds and animals are nesting. Don’t try to do everything at once—think about your fire safety seasonally: plan your activities in

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9 Watershed: All of the land that drains water runoff into a specific body of water. Watersheds may be referred to as drainage areas or drainage basins. Ridges of higher elevation usually form the boundaries between watersheds by directing the water to one side of the ridge or the other. The water then flows to the low point of the watershed.
10 Slope: A percentage or degree change in elevation over a defined distance that measures the steepness of a landscape.
11 Aspect: The direction that a slope faces—north, south, east, west, etc.
12 Firebreak: A strip of land that has been cleared of vegetation to help slow or stop the spread of wildfire. It may be a road, trail, or path cleared of vegetation or other burnable materials. A firebreak could also be a stream.
13 Fuel: All burnable materials including but not limited to living or dead vegetation, structures, and chemicals that feed a fire.
14 Surface Fuels: Materials on the ground like needles or low-growing shrubs that provide the fuel for fires to spread on the ground. Surface fuels are generally considered all fuels within six feet of the ground.
15 Wick: A combustible material that allows fire to travel along a confined path to larger fuel sources. An example would be a wooden fence connected to your home.
16 Ladder Fuels: Materials such as shrubs or small trees connecting the ground to the tree canopy or uppermost vegetation layer. In forests, this allows fire to climb upward into trees.
17 Overstory: The topmost trees in a forest which compose the upper canopy layer; compared to the understory, which is the lower woody or herbaceous layer underneath treetops.
18 Ground-Disturbing Activities: Actions that interrupt the natural condition of the ground, such as digging and compaction from heavy equipment.
the winter and spring; start clearing when the ground begins to dry (when it’s not saturated\(^\text{19}\)) or when there is snow on the ground; finish treatments by early summer before the vegetation is dry; do your defensible space maintenance around and inside your home in the fall; and burn your piles after the rains begin in the winter.

**Your house is likely a fuel source.** Many Sierra homes are located in places where a fire can start and spread into surrounding vegetation. The more you prepare your house and other structures, the less you will have to treat the surrounding vegetation. The biggest improvement you can make to reduce your fire risk is to build or remodel your house to resist the millions of tiny embers\(^\text{20}\) created by ember-attack\(^\text{21}\) from wildfires. When wildfires burn in extreme conditions they send burning firebrands (embers) ahead of them; these firebrands ignite new fires. Using fire-resistant building materials\(^\text{22}\) and appropriately designed structures will give you the best chance to survive wildfire. Replace wood shake roofs with fire-resistant materials. Don’t let your home be part of the problem. An interactive source of information to reduce homeowner risk in the wildland-urban interface is provided by the University of California Center for Fire Research and Outreach; it’s called the Fire Information Engine Toolkit. See firecenter.berkeley.edu/toolkit/homeowners.html for details on how this web-based program can help you make better decisions to reduce your fire risk, and the related UC Extension’s Homeowner’s Wildfire Mitigation Guide groups.ucmg.org/HWMG/index.cfm. Consult your local fire marshal or see firewise.org/resources/files/wildfire2.pdf for more information.

If you are building a new home, consider slope, aspect, surrounding fuels, and your potential environmental impacts before deciding where to site your home. This may be more important than the view in the long term. Talk to your local planning department to learn about local fire-safe building regulations, or see osfm.fire.ca.gov/WUIBS.html, or edddata.fire.ca.gov/pub/fireplan/frplanUpload/frpguidepdf99.pdf for more information about state regulations.

**Know your legal obligations.** Learn the legal requirements regarding defensible space and fire-safe building and construction. Discover how to balance these with the ecological needs of your place.

**Firefighters need your help to protect your home.** Make it safe for them and their equipment to get to and from your house. Be sure they can find you with visible road and address signs. Remember that fire-safe landscaping and construction greatly improves firefighters’ ability to protect your home. See principle 4C below, and www.livingwithfire.info/beforethefire/accesszone/index.php for more information.

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19 Saturated: The broad meaning is “full.” Saturated soil refers to the point at which the soil is so full of water that no more water can get into (be absorbed by) the soil, and therefore must run off.

20 Embers: Small glowing or smoldering pieces of wood or other organic debris, often airborne in a fire.

21 Ember Attack: Embers blown by the wind during a firestorm that accumulate at intersections between horizontal and vertical members on the outside of your house, igniting debris and combustible materials. Embers can also enter into openings (e.g., attic vents and other wall openings), igniting debris on the inside of your home.

22 Fire-Resistant Building Materials: Materials used in the construction of a house that are resistant to ignition when exposed to radiant heat or flames. Examples include clay tile roofs, metal roofs, and stucco siding.
Conservation Principles

Consider the Conservation Principles below in how you approach your fire safety and defensible space. It's all about balance. It is possible to have an aesthetically pleasing landscape that is fire-safe, supports local plant and animal species, and still provides you with privacy and plantings.

1. Remember the Vegetation (Native Trees and Other Plants)
   a. Discover and monitor your forest and vegetation's dynamic changes.

   Plan for the future of your forest. Because you are the conservation steward of your land, your work in the forest will be ongoing. Watch the wild areas on your property and learn from them as they grow and change with your stewardship. Think both in the short term (what will happen this year) and the long term (what will happen over time). Document those changes as the years go by; keep notes and records. Learn how to monitor\textsuperscript{23} the ecological changes on your property and use that information for adaptive management\textsuperscript{24} of your wildlands. To live with wildfire we need to take the responsibility to manage, adapt, and guide the vegetation around our homes. For more information see www.dnr.state.mi.us/publications/pdfs/huntingwildlifehabitat/Landowners_Guide/Habitat_Mgmt/Planning/Evaluating_Land.htm.

   b. Act conservatively.

   We are manually recreating a more fire-resilient landscape\textsuperscript{25}. In doing this, we need to apply the general concepts of the precautionary principle\textsuperscript{26} while implementing fuel treatments\textsuperscript{27}: you can always remove more trees and vegetation at a later time, but you cannot immediately replace what you have cut. The vegetation you leave is ultimately most important. Be sure that what you remove is done with careful planning and consideration to ensure that what you leave standing is healthy and resilient.\textsuperscript{28} See www.mindfully.org/Precautionary/Precautionary-Principle-Common-Sense.htm for more information.

   c. Protect native species that share your home.

   Look at the native vegetation around your property—or ask a local plant or forestry specialist for help—to see what different plants share your home. There may be plants that are rare. If so, protect them by providing defensible space (while keeping in mind their needs, such as shade). Find out if those plants exist in other areas within your watershed and how they are being managed there. Watch for invasive weeds\textsuperscript{29}. Follow vegetation treatments with invasive weed removal. Minimize the

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\textsuperscript{23} Monitor: To watch, keep track of, or check regularly for changes—in this case, to the environment.

\textsuperscript{24} Adaptive Management: An approach to managing the environment/property that is based on a “learn by doing” technique that adjusts to changing conditions. Adjustments in management change over time as new information is learned.

\textsuperscript{25} Fire-Resilient Landscape: A natural landscape featuring plants that have adapted to local wildfire conditions, or a domestic outdoor space where appropriate actions have been taken to make it less vulnerable to wildfire and certainly less prone to causing one.

\textsuperscript{26} Precautionary Principle: A concept that promotes a cautious approach to development and managing the environment when information is uncertain or unreliable. Erring on the side of caution and conservation is encouraged, along with a “Better safe than sorry” attitude.

\textsuperscript{27} Fuel Treatment: The act of removing combustible materials to lower the risk of fires igniting and to lessen the likelihood of damage to property and communities. Treatments may include creating a defensible space, developing fuelbreaks, initiating prescribed burns, and thinning vegetation.

\textsuperscript{28} Resilient, Resiliency: The ability of an ecosystem to return to its balanced state after a disturbance.

\textsuperscript{29} Invasive Weeds: Undesirable plants that are not native and have been introduced to an area by humans. These plants generally have no natural enemies and are able to spread rapidly throughout the new location. Some examples include Himalayan Blackberries, English Ivy, and Scotch Broom.
introduction of exotic plant species near your home, especially those that can spread into adjacent wildland areas. Invasive species can change your fire hazard very quickly and be difficult to manage.


d. Keep the oldest and biggest trees.

Generally, most of the oldest trees in the forest are no longer present. If you have old or very large trees, create defensible space around them so they will survive wildfire. This may include raking away thick duff\(^{30}\) at the base of the trees. Notice that these trees often have thick bark so they are generally fire-resistant (they have evolved with fire). Think about their protection in terms of building a fire in your woodstove: A big log won’t start burning without a lot of smaller kindling (e.g. small trees, shrubs, branches, etc.). In your forest, make sure that the smaller kindling isn’t around the bottom of your big trees, and generally the trees will make it through a wildfire on their own. In some cases, you’ll need to remove smaller trees that touch the crown of the tallest trees. At the same time, you don’t want to remove all of the small trees in your forest. Small trees are the next generation of large trees. Keep enough regeneration,\(^{31}\) possibly in small patches, to provide for the future forest, while still providing adequate space between all the trees you keep standing. An additional benefit of keeping your biggest trees is that they can break up the wind as it’s moving through, which can slow down fire spread. See www.erl.nau.edu/cms/content/view/544/740/ for more information.

2. Remember the Wildlife

a. Provide local wildlife a place to live.

Become familiar with the animals that share your property. Talk to local wildlife experts and/or bird watchers. Learn what wildlife need in terms of shelter, food, water, and reproduction. Remember that your property is their home too. Find ways to balance your land management activities with their needs, and leave some areas untreated\(^{32}\) for the birds and wildlife using them. Protect them as you would your home by creating defensible space while still considering their needs for cover.\(^{33}\) If you watch quietly you may see animals using those areas. For more information, see www.fs.fed.us/psw/rsl/projects/wild/verner/psw_37.html and cetuolumne.ucdavis.edu/newsletterfiles/Master_Gardener_Articles_20044858.doc.

b. Provide access to food and water.

Protect and retain trees with nests and cavities, or where obvious wildlife feeding or nesting activities are occurring. Leave some plants that have berries or other fruit or mast\(^{34}\) used by wildlife. Act especially carefully and leave cover around streams, seeps,\(^{35}\) or other wet areas to keep those areas cool and wet; this will provide wildlife the protective cover they need when they are using those places or moving to and from them. Make sure all natural water supplies are clean by keeping any

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\(^{30}\)Duff: A layer on the forest floor that is made up of decomposing organic matter such as leaves, needles, and small branches.

\(^{31}\)Regeneration: The renewal of trees or forests by planting seedlings, or the direct seeding by humans, wind, birds, or animals after large disturbances like fire. “Regeneration” also refers to the young trees that were naturally seeded or planted.

\(^{32}\)Untreated: Not altered from a natural or original state; e.g. no fuel reduction or defensible space activities.

\(^{33}\)Cover: Any plants or organic matter that holds soil in place or grows over and creates shade that provides wildlife with an area to reproduce and find protection from predators and weather.

\(^{34}\)Mast: Nuts or fruits of trees and shrubs such as acorns, walnuts, or berries that collect on the forest floor and are a food source for animals.

\(^{35}\)Seep: An area where water rises from an underground source to the surface and creates a wet area.
poisons and sediment\textsuperscript{36} away from any water that could drain into them. \textit{For more information, see} 

c. Protect future generations of wildlife.

Find out when local species are nesting and/or breeding and avoid working in and around your wildlands during those times. Learn what kind of habitat local species might use for nesting and breeding, and be sure to protect those areas during your management activities. \textit{See} 
www.paws.org/about/emailnetwork/archive/wildagain/wild_2004_06_02.html and 
www.audubon.org/bird/at_home/SafeMisc.html for more information.

d. Value the standing dead trees.

Standing dead trees—or \textit{snags}\textsuperscript{37}—are especially important for wildlife. They provide both shelter and food to many birds and other animals. However, they can also be a wildfire hazard if they are near enough to fall on your home or fall and block an evacuation road during a fire. Balance the needs of wildlife with your need for fire safety. Think about your home within the landscape; if you’ve got snags in the area, you don’t need them next to the house. Take the time to find the most appropriate actions for your unique place. \textit{See} 
www.mwf.org/backyard/snags.cfm for more information.

e. Conserve rare and endangered species.

One of the bonuses—and responsibilities—of living in the Sierra is living with the many rare and endangered species with which you share habitat. Find out if there are rare or endangered species in your area by talking to your local Cooperative Extension Agent or Forest Service wildlife biologist. Plan your fuel reduction actions around the needs of these species. Often by a fairly minor refinement of your activities, such as timing, technique, or extent, you can protect species while realizing your fuel reduction goals. \textit{For more information, see} 
www.dfg.ca.gov/hcph/species/t_e_spp/tespp.shtm, 

3. Remember the Soil

a. Maintain the life in your soil.

There is as much or more activity below the ground on your property as there is above the ground. Keep this in mind in terms of what you do above ground. Talk to your Cooperative Extension Agent or local gardeners to find out what \textit{soil types}\textsuperscript{38} are on your property. Some soil types can tolerate much more \textit{disturbance}\textsuperscript{39} than others. Minimize activities that could \textit{compact},\textsuperscript{40} flood, or poison your soil. The health of your land is directly dependent on the health of your soil. As such, the soil is one of the most valuable assets of your property. \textit{See} 
managingwholes.com/new-topsoil.htm for more information.

\textsuperscript{36} Sediment: Particles of topsoil, sand, and minerals that come from soil erosion or decomposing plants and animals. Wind, water, and ice carry these particles; when the sediment collects in waterways it can destroy fish and wildlife habitat.

\textsuperscript{37} Snag: A standing dead tree that has usually lost most of its branches. Snags offer essential food and cover for a host of wildlife species.

\textsuperscript{38} Soil Type: Refers to the different combinations of soil particles and soil composition. Soil can vary greatly within short distances.

\textsuperscript{39} Disturbance: Various activities that disrupt the normal state of the soil such as digging, erosion, compaction by heavy equipment, etc.

\textsuperscript{40} Compact: To pack closely or tightly together, as in the fragments of soil being compacted from heavy equipment, thereby limiting the ability of oxygen or water to pass freely.
b. Ensure that your soil cover is fire safe.

Replace cover that burns easily (such as dry or dead vegetation) with cover that is less flammable\(^{41}\) (e.g., gravel, fleshy green plants, etc.). The objective is to ensure that if and when a fire comes through, it is not so hot that it kills the life in your soil. Rather, it should move through without a lot of fuel to consume in its path. For example, a very light layer of pine needles can help with soil erosion (see below), but too much can be a fuel problem. See [http://www.lasplitas.com/classes/fire_burn_times.html](http://www.lasplitas.com/classes/fire_burn_times.html) for more information.

c. Minimize erosion.

Protect your soil by keeping it covered. Cover helps to prevent erosion\(^{42}\), especially on ground that is not flat; it keeps the soil in place. Don’t let soil move across your property, most importantly not into streams or other natural water sources. Keep ground-disturbing activities away from unstable\(^{43}\) areas and riparian\(^{44}\) areas. Pay special attention on steep slopes. The steeper the slope, the faster the soil can move downhill if it’s disturbed, and the faster a fire can climb uphill under the right (or wrong!) conditions. See [http://www.uri.edu/ce/healthylandscapes/tips/6.html](http://www.uri.edu/ce/healthylandscapes/tips/6.html) and [http://www.pfmt.org/fire/topos_effect.htm](http://www.pfmt.org/fire/topos_effect.htm) for more information.

d. Protect your soil after a fire.

Soil can be most fragile after a wildfire. This is often exacerbated when winter rains come soon after a fire. The potential for erosion and loss of soil is huge with this combination of conditions. If you have experienced fire on your property, get cover onto your soil as soon as you can to prevent erosion. Remember, your soil is alive, so help it grow. See [http://ext.colostate.edu/PUBS/NATRES/06308.html](http://ext.colostate.edu/PUBS/NATRES/06308.html) and [http://www.cnrs.uidaho.edu/extforest/AftertheBurnFINAL.pdf](http://www.cnrs.uidaho.edu/extforest/AftertheBurnFINAL.pdf) for more information.

4. Remember the People

a. Plan your actions with your neighbors.

Talk to your neighbors. Find out what they are doing on their land. Find ways to cooperate in your land management actions. Your defensible space will likely impact your neighbor’s chances of surviving a wildfire and vice-versa. Talk about what to do in an emergency and how to most safely evacuate. Find out if there is a Fire Safe Council (FSC) in your community, and if so, get involved. Help make your community a Firewise community. Coordinated work amongst neighbors will have a greater impact on your individual fire safety. For more information, see [www.firesafecouncil.org](http://www.firesafecouncil.org), [www.fire.ca.gov/about_content/downloads/Evacuation2006.pdf](http://www.fire.ca.gov/about_content/downloads/Evacuation2006.pdf), and [www.firewise.org](http://www.firewise.org).

b. Find experienced workers and treat them well.

Forestry workers with chainsaws in hand are the actual decision-makers as to what stays or goes—what lives or dies—in your forest. If your objective is to reduce fuels while still maintaining ecological integrity and diversity on a site, your workers must have the knowledge and experience to help you achieve this. Involve the workforce in the design, planning, and monitoring of projects. Talk to your local FSC or neighbors and check references to find reputable contractors. Pay workers well and maybe even bring them chocolate chip cookies; this will achieve better ecological outcomes on the ground. Happy, respected people do the best work. See [exp.uoregon.edu/programs.html](http://exp.uoregon.edu/programs.html) for more information.

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\(^{41}\) Flammable: A quality of a substance that makes it likely to catch fire, be easily ignited, burn quickly and/or have a fast rate of spreading flames.

\(^{42}\) Erosion: The removal of soil over time by weather, wind and/or water such as rain or water runoff from roads.

\(^{43}\) Unstable: Land that is lacking stability, or liable to change with activity, such as in the case of steep slopes or crumbly soils.

\(^{44}\) Riparian: A strip of land along the bank of a natural freshwater stream, river, creek, or lake that provides vast diversity and productivity of plants and animals.
c. Work with your local fire department.

Talk to your local firefighters. Find out what they need to safely get to your house and back out. Make sure that your access roads\(^{45}\) are safe; maintain your fuel treatments along all roads, both for firefighter safety in protecting your home and your safety in case of evacuation. Let firefighters know where you live and what’s on your property; invite them out to see it. Have street and address signs visible so out-of-town firefighters can find you if there is a big fire. Make sure you have a water supply they can find and use. Know where and how to turn off any fuel sources such as natural gas or propane. See www.projecttahs.org/pdf/firedepartment.doc for more information.

These Principles were developed by the following Steering Committee members between September 2006 and June 2007 for the Sierra Nevada Community Conservation and Wildfire Protection Plan Guidebook:

- Warren Alford, Fire and Fuels Policy Coordinator, Sierra Forest Legacy
- Marko Bey, Lomakatsi Restoration Project
- Louis Blumberg, California Forest Initiative Director, The Nature Conservancy
- Susan Britting, PhD
- Kate Dargan, State Fire Marshal, CA Dept. of Forestry and Fire Protection (CAL FIRE)
- Rich Fairbanks, Forest and Fire Program Associate, The Wilderness Society
- Tracy Katelman, ForEverGreen Forestry
- Paul Mason, Legislative Representative, Sierra Club California
- Wayne Mitchell, Asst. Deputy Director, Fire Prevention and Planning, CAL FIRE
- Gary Nakamura, Forestry Specialist, University of California (UC) Cooperative Extension
- Christine Nota, Regional Forester’s Representative, US Forest Service Region 5
- Carol Rice, Wildland Resource Management
- Carl Skinner, Science Team Leader, US Forest Service Pacific Southwest Research Station
- Scott Stephens, Assistant Professor of Fire Science, UC Berkeley
- Craig Thomas, Director, Sierra Forest Legacy
- Jay Watson, Director, California Fire Safe Council
- Vicki Yorts, Executive Director, El Dorado County Fire Safe Council

For more information, see forevergreenforestry.com/SierraConservationCWPP.html.


\(^{45}\) Access Roads: Roads that allow entrance into and out of a property.
45B. Wildland Fire Safety at Home

B.1. Before the Fire
B.1.1. Defensible Space and Home Survival
B.1.2. Water Supply
B.1.3. Roads and Access

B.2. During the Fire
B.2.1. Evacuation
B.2.2. Shelter in Place
B.2.3. Safety Zones
B.2.4. Preparing Pets and Livestock

B.3. After the Fire
B.3.1. Assess Your Situation
B.3.2. Developing and Implementing a Restoration Plan
B.3.3. Make a Plan to Be Better Prepared Next Time
B. Wildland Fire Safety at Home

The general principle behind making an area fire safe (making it as safe as possible for when a fire might pass through) is to reduce the amount of fuel and modify the arrangement of fuel that a fire could consume. Three factors are required for fire, and are known as the fire triangle: fuel, oxygen, and heat. If any one of these elements is missing, a fire won’t start or, should it start, it won’t spread. In a wildland situation, the three factors that dictate the extent and severity of fire behavior are fuel, weather, and topography. Fuel is the one element of the three that we can significantly modify. When there is a lot of fuel, a fire can burn very hot and move very quickly. When there is little fuel present, fires tend to slow down and burn cooler. Cooler fires are much easier to control.

For example, in a forest environment, fires that stay on the forest floor—surface fires—tend to be cooler, and hence easier to put out. Ladder fuel (understory trees and brush) connect the surface fuel to the canopy and, once ignited, this combination can support a crown fire. Crown fires can move very quickly, burn very hot, and are much harder to put out. They also generate the most embers, and can create spot fires from a few feet to miles away depending on conditions. Embers and spot fires are often why homes burn and fires are difficult to control. One of the main objectives of being fire safe and creating defensible space is to minimize the chance of a fire becoming a crown fire, which will threaten your home, neighborhood, and community. Clearly, it is in your best interest to reduce the amount, type, and arrangement of fuel near your home to reduce the risk of a wildfire consuming it.

B.1. Before the Fire

B.1.1. Defensible Space and Home Survivability

Defensible space means creating a space around your structure so it can be defended from a wildfire. The US Forest Service defines defensible space as “an area either natural or manmade where material capable of causing a fire to spread has been treated, cleared, reduced, or changed to act as a barrier between an advancing wildland fire and the loss of life, property, or resources. In practice, defensible space is defined (in California) as an area a minimum of (100) feet’ around a structure that is cleared of flammable brush or vegetation.”

Firefighters sometimes use the terms “winners” and “losers” (preferable terms are “defendable” and “not defendable”) to distinguish between those houses with defensible space versus those that do not have it. In a larger emergency situation (where many homes are threatened), homes without defensible space may get passed over in favor of protecting those with defensible space, which have a greater chance of survival and offer firefighters a safer environment. (The safety of firefighters is critical in structure protection. Homeowners should provide an inviting condition, especially in the Sierra where many fire departments are volunteer based; firefighters may be your friends, neighbors, or family members.) If it is too dangerous for firefighters to get in and out of an area, they are instructed not to risk their lives and equipment to save a home that is not defensible.

The Plumas Fire Safe Council promotes the concept of home survived. It’s not just about “defending” your space or home, but being fire safe in such a way as to ensure its survivability from fire. This is the ultimate goal for conservation-based fuel reduction and fire safety efforts; living with wildfire.

Defensible Space and Fire-Resistant Landscaping Basics

There are many simple steps you can take to create your defensible space. Homes ignite because of the little things—things that are easily ignited by embers, even when the fire has not arrived, or has already passed. The basics include:

- Providing a minimum of thirty to one hundred feet of clearance of flammable materials around your home. As you’ll see later in this document, clearance does not mean dirt or gravel, it’s about flammability. If you live on a hill, you should extend this up to two hundred feet, depending upon the steepness of the slope and the presence of surrounding fuel. See B.1.1.3, Zones Practices Table, for more information.
• Landscape your defensible space zone with fire-safe plants. While no plant is immune to fire, certain plants do exhibit traits that can slow or reduce the spread of fire. Most deciduous trees and shrubs are fire resistant. They generally look green (not brown), healthy, and vibrant. In addition, fire-resistant plants have:
  o leaves that are moist and supple;
  o little dead wood, and they tend not to accumulate dry, dead material within the plant;
  o sap that is water-like (versus thicker or stickier) and does not have a strong odor. For more information on fire safe landscaping, please see “Fire-Resistant Plants for Your Landscape” and “El Dorado County Fire Resistant Landscaping” in Background D.

• Keep your gutters and roofs clean of vegetation and debris, especially pine needles.

• Move all flammable materials—especially firewood, propane tanks, etc.—at least thirty feet away from your home and any structures.

• Think about your home in terms of flammability. When you start a fire in a woodstove, small pieces of wood and paper are required to ignite the logs. The same is true for your home. Anything around your home that will ignite easily will threaten your home. It can serve as kindling for your house in the event of a fire. Look at your home and surrounding land with a new perspective. Shortly after removing dead vegetation and other flammable materials that may be adjacent to your home, you will begin to view the area with a different perspective. Objects that you didn’t notice before as being a threat to your home will jump out at you. Think about if you would be comfortable if someone threw a match at your house.

• Remember the other critters who share the land. Leave a vegetation buffer around streams and other wildlife corridors. (See the Conservation Principles, section 1.3 for more information.)

• Spend a few hours reviewing your home and property with the Homeowner’s Checklist (Background D). Identify where you are safe and what other steps you need to take to protect your home and family. You can get free help with identifying fire safety and defensible space issues around your home. Contact your local fire department 209-742-4360, California Dept. of Forestry and Fire Protection, CAL FIRE 209-966-3622, US Forest Service 559-877-2218, US Bureau of Land Management 916-941-3101, or local Fire Safe Council 209-966-7700. Any of these groups will gladly help you obtain a free fire-safety inspection for your home.

Background D contains more detailed information on defensible space and fire safety, including resources for further reading, and Public Resources Codes 4290 and 4291, which are explained below.

B.1.1.1. The Home Ignition Zone

The Home Ignition Zone is a concept introduced by Dr. Jack Cohen of the US Forest Service Rocky Mountain Research Station. Dr. Cohen’s research of fires from the 1960s to the present has revealed that more than eighty percent of homes with at least thirty feet of defensible space and a fire-resistant roof have survived wildfires. His research indicates that:

The potential for home ignitions during wildfires including those of high intensity principally depends on a home’s fuel characteristics and the heat sources within 100 to 200 feet adjacent to a home…. This relatively limited area that determines home ignition potential can be called the home ignition zone.

During a wildland-urban fire a home ignites from two possible sources: directly from flames (radiation and convection heating) and/or from firebrands accumulating directly on the home. Even the large flames of high-intensity crown fires do not directly ignite homes at distances beyond 200 feet. Given that fires adjacent to a home do not ignite it, firebrands can only ignite a home through contact. Thus, the home ignition zone becomes the focus for activities to reduce potential wildland-urban fire destruction. This has implications for reducing home ignition potential before a wildfire as well as implications for emergency wildland-urban fire response strategy and tactics….

Because of time constraints, most preparation has to come before a wildfire occurs. Major changes to the home ignition zone (the home and its immediate surroundings) such as replacing a flammable roof and removal of vegetation … cannot occur during the approach of a wildfire. Removal of firewood piles, dead leaves, conifer needles, dead grass, etc., from on and next to the
home should also occur seasonally before severe fire conditions. The ignition potential of the home ignition zone largely influences the effectiveness of protection during a wildfire. Given low ignition potential and enough time, homeowners and/or wildland-urban suppression resources can make significant reductions in the little things that influence ignition potential before wildfire encroachment. Then, if possible, homeowners and/or wildland-urban firefighting resources can suppress small fires that threaten the structure during and after the wildfire approach.19

The concepts forwarded by Dr. Cohen about the Home Ignition Zone are important to keep in mind when designing your defensible space and fuel reduction prescriptions.

**B.1.1.2. Fire Safety Zones for Your Property**

We can take the Home Ignition Zone and break it into four sub-zones. You can think of your property in terms of this set of zones. Use them to help you develop the appropriate treatment for each area around your property. See the table that follows this section for sample treatments organized by the Conservation Principles.

The concept of zones around your home has become popular recently. Several organizations have developed their own set of zones, such as: the California Fire Safe Council (firesafecouncil.org/education/attachments/landscapingtimberland.pdf), Firewise (www.firewise.org/resources/files/fw_brochure.pdf), and the California Board of Forestry (www.bof.fire.ca.gov/pdfs/Copyof4291finalguidelines9_29_06.pdf). All of these and the zones identified below follow the same basic concept of increasing the intensity of your fuel reduction efforts the closer you get to the home or other buildings. The following zones were developed to implement practices consistent with the Conservation Principles identified in Section 1.3.

The **Fire-Free Zone** is your home and five feet beyond. This is the zone immediately surrounding your home and should be made of concrete, gravel, or some other non-flammable surface. It can include irrigated plants if they are low-growing, well watered, and not touching your house. Remove any and all flammable materials in this zone. Paramount objectives of this zone are homesite protection and thorough fuel reduction activities.

The **Structural Protection Zone** extends from the Fire-Free Zone out to thirty feet. This is what CAL FIRE calls the “lean and green” zone. Remove flammable materials here as well. Keep all vegetation healthy and green. The objective in this zone is to keep all flammable fuels away from your home to facilitate fire protection. Similar to the Fire-Free zone, the paramount objective is to reduce or remove all fuels that could threaten your home.

The **Defensible Space Zone** extends from the Structural Protection Zone out to a distance of one hundred feet or more, or to your property line, whichever is greater. In this zone you will encounter more wildland characteristics and will need to begin to balance your fire safety and conservation goals. This area is the secondary fuel reduction zone. Both fuel reduction and forest health are objectives for this zone. Practices for this zone include: mowing grasses to three inches or less, keeping shrubs low and widely spaced (eighteen inches or less in height), and removing lower limbs at least ten feet off the ground or one-third the height of the tree (use the latter measure if the tree is less than thirty feet tall).

Finally, the **Wildland Fuel-Reduction Zone** is the last zone, extending from the Defensible Space Zone out an additional one hundred to two hundred feet or even much further. This is the zone where you will carry out wildland fuel treatment prescriptions; the objective is to aid in the health and productivity of your wildland while conserving natural values. Within this zone forest restoration work can be coupled with fuel reduction efforts for the long-term health, resiliency, and productivity of the more remote areas of your property.

See the Sierra Nevada Conservation Fire Zones Table on the following pages for a list of practices to apply to each zone based on the Conservation Principles. See Background C: Wildland Fuel Reduction for more details on the prescriptions for the areas further away from you home.
### B.1.1.3. Sierra Nevada Conservation Fire Zones Table

Once you learn some of the basic fire safe practices, you are ready to expand them to include the Conservation Principles. The table below will help you apply these principles to each of the four zones on your property as identified above. See the following sections, and Background C: Wildland Fuel Hazard Reduction for more information on techniques and terminology.

**Figure 1. Sierra Nevada Conservation Fire Zones Practices**

<table>
<thead>
<tr>
<th>Conservation Principle</th>
<th>Fire-Free Zone (House + 5 feet)</th>
<th>Structural Protection Zone (5-30 feet)</th>
<th>Defensible Space Zone (30-100 feet)</th>
<th>Wildland Fuel-Reduction Zone (100 feet to property boundary)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1A. Remember the Native Trees and Other Plants</strong></td>
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<tr>
<td>- Assess native tree and plant species types on site.</td>
<td>- Identify plant community types within your defensible space zone.</td>
<td>- Prior to treatments document the condition of the plant community.</td>
<td>- Learn the name and boundaries of your watershed.</td>
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<tr>
<td>- Identify natural fire breaks within this zone.</td>
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<td>- Clear dead branches and leaves on the ground, especially after windy days.</td>
<td>- Identify natural fire breaks on and nearby your property.</td>
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<td></td>
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<td>- Limb up or prune lower branches 1-2 times/year before fire season.</td>
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<td></td>
<td>- Perform regular or annual maintenance on stump-sprouting species, and invasive noxious weeds that may move into the site.</td>
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<td></td>
<td></td>
<td>- Return to previously treated areas every spring and repeat treatments as necessary.</td>
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<td>- Monitor and observe the previous work you have performed and evaluate the health and conditions of the forest.</td>
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<td></td>
<td>- Use the information you have learned and apply the lessons to other locations you may treat on your property.</td>
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<td></td>
<td></td>
<td>- Calculate the slope of your property to identify your recommended treatment area. For moderate slopes of 20-40%, treat 100-200 feet, for steeper slopes treat to 200 feet or beyond.</td>
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<tr>
<td><strong>1B. Act conservatively.</strong></td>
<td>- Rake leaves, clear roofs and gutters after windy days.</td>
<td>- Continually prune dead branches and leaves from all plants.</td>
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<tr>
<td><strong>1C. Protect native species that share your home.</strong></td>
<td></td>
<td>- Plant fire-resistant and drought-resistant native species.</td>
<td>- Learn what plants are on your property and how they would respond to fire.</td>
<td>- Learn what plants are in your watershed.</td>
</tr>
</tbody>
</table>
| Conservation Principle | Fire-Free Zone  
*House + 5 feet* | Conservation Practices and Considerations for Each Zone |
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<tr>
<td>1D. Keep the oldest and biggest trees.</td>
<td>- Remove all flammable objects from this zone, including brooms, woodpiles, garbage, etc.</td>
</tr>
<tr>
<td>2. Remember the Wildlife</td>
<td>- Clear most understory vegetation nearest to your home (ladder fuels). - Retain the healthiest and biggest trees in this zone. Thin understory trees very thoroughly to reduce ladder fuels.</td>
</tr>
<tr>
<td>2A. Provide local wildlife a place to live.</td>
<td>- Initiate fuel reduction treatments with sensitivity to the needs of wildlife. - Remove more fuels closer to the homesite. As you move further away wildlife considerations will be more paramount.</td>
</tr>
</tbody>
</table>

*Midpines Community Conservation and Wildfire Protection Plan, Wildfire Safety at Home*
<table>
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<tr>
<th>Conservation Principle</th>
<th>Fire-Free Zone&lt;br&gt;House + 5 feet</th>
<th>Structural Protection&lt;br&gt;Zone 5-30 feet</th>
<th>Defensible Space Zone&lt;br&gt;30-100 feet</th>
<th>Wildland Fuel-Reduction Zone&lt;br&gt;100 feet to property boundary</th>
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<tr>
<td>2B. Provide access to food and water.</td>
<td>- Keep food and other wildlife attractants away from your house.</td>
<td>- Provide pure, clean water in ponds or fountains. Don’t add any chemicals that could injure birds or wildlife.</td>
<td>- Leave forest cover around riparian areas for 50-100 feet from the water. - Retain as much canopy closure and vegetative cover as possible for ephemeral and perennial stream gulches. - Leave healthy hardwood trees and fruit-producing shrubs for food for local wildlife. - Retain sheltered connectivity and major game trails between selected vegetation retention areas.</td>
<td>- Leave green islands of tree or shrub thickets (e.g. doghair conifer patches) for wildlife habitat throughout the stand. - Create repeating gaps of varying sizes and shapes to retain and create a diversity of habitat types for wildlife. This is in line with the Precautionary Principle.</td>
</tr>
<tr>
<td>2C. Protect future generations of wildlife.</td>
<td>- Keep pets away from nests and other wildlife habitat.</td>
<td>- Avoid defensible space treatments during the nesting or breeding season of local birds and other wildlife. - Avoid the use of herbicides that are lethal to wildlife. - We recommend non-chemical methods for managing plants, but if you are to use herbicides, hire a certified professional who understands application ratios that may minimize impacts on newborn or young wildlife. (This may be suited for all zones.)</td>
<td>- If you have snags around your home reduce the height of these standing dead trees by removing all dead branches, leave the main trunk intact, and top the tree down to 10 ft. above the ground.</td>
<td>- Identify where snags are in the surrounding landscape to help you decide whether to keep or remove snags closer to your home. If there is an abundance of snags, remove the smallest, most decayed ones. For those you leave, create defensible space around them.</td>
</tr>
<tr>
<td>2D. Value the standing dead trees.</td>
<td>- If you have snags around your home reduce the height of these standing dead trees by removing all dead branches, leave the main trunk intact, and top the tree down to 10 ft. above the ground.</td>
<td>- Look at the size and proximity of snags to your home or other structures that you want to protect (such as large, old, live trees or wildlife nesting areas). Generally, the bigger the snag, the less likely it will ignite. If the snag were to fall, where would it land? If</td>
<td>- If you have snags around your home reduce the height of these standing dead trees by removing all dead branches, leave the main trunk intact, and top the tree down to 10 ft. above the ground.</td>
<td>- Identify where snags are in the surrounding landscape to help you decide whether to keep or remove snags closer to your home. If there is an abundance of snags, remove the smallest, most decayed ones. For those you leave, create defensible space around them.</td>
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<td>Conservation Principle</td>
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<td>Fire-Free Zone  House + 5 feet</td>
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<td>Structural Protection Zone  5-30 feet</td>
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<td>Defensible Space Zone 30-100 feet</td>
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<td>Wildland Fuel-Reduction Zone 100 feet to property boundary</td>
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<td>2E. Conserve rare and endangered species.</td>
<td>- Find out if there are rare or endangered species on your property and what precautions you need to take to protect them and their habitat.</td>
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<tr>
<td>3. Remember the Soil</td>
<td>- Keep water drainage away from your house. Don’t concentrate water flow in any one place.</td>
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<td>- Impervious surfaces (such as concrete) are great for fire but not great for water flow and erosion.</td>
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<td>- Don’t use pesticides or other poisons that will kill soil life.</td>
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<td>- When burning to dispose of slash, leave unburned areas. Protect soil resources by retaining some leaf litter, needles, and organic materials.</td>
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<td>- Retain scattered areas of ground fuels.</td>
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<td>- Retain coarse woody debris in selected locations.</td>
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<td>- Retain the large, downed-wood component.</td>
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<td>- Follow burning with the sowing of native grasses in the mineral-rich ashes and disturbed soils to reduce colonization by non-native species.</td>
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<td>Conservation Principle</td>
<td>Conservation Practices and Considerations for Each Zone</td>
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<td><strong>3B. Ensure that your soil cover is fire safe.</strong></td>
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<td><strong>3C. Minimize erosion.</strong></td>
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<td><strong>3D. Protect your soil after a fire.</strong></td>
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</table>
| Conservation Principle | Fire-Free Zone  
House + 5 feet | Structural Protection  
Zone 5-30 feet | Defensible Space Zone  
30-100 feet | Wildland Fuel-Reduction Zone  
100 feet to property boundary |
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<td></td>
<td>Use bark-chipped, native species organic mulch to cover disturbed soil.</td>
<td>Limit the use of non-native straw as it will introduce invasive annual grasses which over the long term will create a fire hazard.</td>
<td>Place coarse woody debris on the ground to protect soil. Small logs from 4&quot; - 8&quot; diameter are best suited.</td>
</tr>
</tbody>
</table>

4. Remember the People

4A. Plan your actions with your neighbors.

- Let your neighbors know about the locations of water and gas shut-offs, and the location of any domestic animals, in case of a wildfire.

- Cooperate on roadside fuels treatments where multiple neighbors share easement access routes.

- Collaborate and plan contiguous strategic fuels treatments with your neighbors that will benefit multiple residences during a fire.

- Collaborate with your neighbors on ecological considerations and conservation issues that cross property ownerships. As an example, you may share a stream course or animal trail, or sensitive habitat for plants or animals on multiple properties. Communicate about these issues and work together to perform responsible fuels management.

- Plan actions with your neighbors who may be located above or below you on a steep slope. Consider erosion that may be caused and affect your neighbors from your fuels work. Work together for solutions.

4B. Find experienced workers and treat them well.

- Research forestry contractors before hiring them. Ask your neighbors who they have used and like. Talk to local resource professional for references. Make sure the contractors know the site-specific ecological considerations for the vegetation type on your property.

- When hiring a forestry contractor, some questions you might ask are: Do the workers have workers compensation insurance in the event of injury on the job? What are the wages they earn? Do the workers get the legal on-the-clock breaks they are due? Do the workers have safety gear? Has the contractor ever been cited for workplace abuse issues?

- One method is to hire a crew for a one-day trial period to evaluate their work performance. Following the one-day contract, evaluate how they implemented the treatment. Did they leave enough vegetation? Was the thinning too heavy or too light? Were they sensitive to retaining diversity and conservation priorities?

- There are many forestry contractors; only some understand both fuel reduction and ecology. Be selective about who you hire.

4C. Work with your local fire department.

- Make sure local fire fighters know where your water and gas shut-offs are located. Take the time to show firefighters around your property outside of fire season, when there is little to no threat of wildfire.

- Keep important information such as emergency phone numbers and your location (latitude and longitude or township, range, section if you do not have a physical address), near the phone in case of wildfire.

- Let firefighters know about the location of any domestic animals and other important locations in this zone.

- Inform the fire department of the layout of your property. Highlight fire-suppression anchor points, spur roads, skid trails, snag locations. If you have the capability, you can use a GPS to outline this, then overlay it onto a map of your property. Keep this map near the phone in case of wildfire.

- Inform the local fire department about...
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<tr>
<th>Conservation Principle</th>
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<td>Fire-Free Zone</td>
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<td>Defensible Space Zone</td>
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<tr>
<td></td>
<td>30-100 feet</td>
</tr>
<tr>
<td></td>
<td>Wildland Fuel-Reduction Zone</td>
</tr>
<tr>
<td></td>
<td>100 feet to property boundary</td>
</tr>
<tr>
<td></td>
<td>any completed fuel reduction work.</td>
</tr>
</tbody>
</table>
B.1.1.4. Creating Defensible Space

The Fire-Free Zone, Structural Protection Zone, and Defensible Space Zone comprise the immediate one-hundred-foot buffer around the homesite. While ecological considerations regarding vegetation types will be considered, fuel reduction will be the paramount management objective here. The intention regarding treatment in these zones is to create a defensible perimeter around the home where a fire would decrease in intensity. These zones provide better opportunities for fire-suppression activities, thus maximizing the chances for protecting the home. Fuel treatments begin by reducing both live and dead fuels closest to the homesite and gradually feathering\textsuperscript{16} the treatment, by thinning less vegetation as you move away from the homesite. The reduction in surface and ground fuels is a key objective for this area. This can be accomplished by seasonal rotations of isolated patch under-burns.\textsuperscript{17} (See Background C.2.1 for more information on burning.)

Much of what you need to do comes down to common sense and an awareness of your physical surroundings. An important thing to know about fire in forested rural areas is the concept of fuel ladders,\textsuperscript{18} defined as a continuous line of vegetation from the forest floor into the canopy (or upper branches) of the trees. The concept of fuel continuity\textsuperscript{19} is similar and includes both vertical and horizontal directions. Vertical continuity is the fuel ladder concept; horizontal fuel continuity thus means a continuous horizontal line of fuel (usually on the ground). In the latter case, the fuel extends from something—like your house—continuously out into the forest. A good example of this is seen with decks on steep slopes, where the edge of the deck is next to the crowns or tops of the trees (forest canopy). If a fire started either at the house or in the forest, it would have a continuous line of fuel to spread from one to the other via the deck.

An example of a fuel ladder (and vertical continuity) in a forested setting is grass and/or brush on the ground climbing up or leading into smaller trees, especially via the dead limbs, which reach up into the canopy of the taller or dominant trees. With this continuous ladder of fuel into the forest canopy, it is easier for a fire to climb into the trees and spread quickly. To avoid this—especially near buildings and along roads—reduce or remove the fuel ladder. The same is true for non-forested landscapes, the main difference is the height of the different vegetation layers.

To reduce forest-type ladder fuels, start in the forests within one-hundred feet of your home and along your roads. Remove brush on the forest floor (but don’t scrape it clean or you could have erosion problems when it rains). Removing ground fuels does not mean removing everything growing on the ground. Rather, you can leave clumps of vegetation. The objective is to leave vertical and horizontal space between fuels (in this case, plants). Limb up\textsuperscript{20} or prune young trees (remove the lower limbs to create open space between the tree canopy and the forest floor) to a minimum of fifteen to thirty feet above ground, or at least six to ten feet above the nearest vegetation.

Young, short trees should be pruned higher incrementally to reduce the chance of shock. A rule of thumb when limbing\textsuperscript{21} trees is to leave at least one-half to two-thirds of the tree’s height in live canopy so you don’t harm the tree’s ability to grow. You can remove more later, do it in stages so the tree has a chance to adapt. If you leave clumps of shrubs, create at least three times the shrub height in space before the bottom branches of the trees. For example, if you have a three-foot-high bush, leave nine feet of open, clear space (no vegetation) below the bottom branches of the nearby trees. The table below shows how much space you need to have between your trees in your defensible-space area. The clearance suggested in this table is often too much canopy opening for wildland areas (because it will likely increase the amount of sun on the ground and encourage more shrub and herbaceous understory growth, increasing these fuels). See Background C for more information on appropriate practices in the Wildland Fuel-Reduction Zone.
Figure 2: Plant Spacing Guidelines for Structural Protection and Defensible Space Zones

<table>
<thead>
<tr>
<th>Trees</th>
<th>Minimum horizontal space from edge of one tree canopy to the edge of the next</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slope</td>
<td>Spacing</td>
</tr>
<tr>
<td>0% to 20%</td>
<td>10 feet</td>
</tr>
<tr>
<td>20% to 40%</td>
<td>20 feet</td>
</tr>
<tr>
<td>Greater than 40%</td>
<td>30 feet</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Shrubs</th>
<th>Minimum horizontal space between edges of shrub</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slope</td>
<td>Spacing</td>
</tr>
<tr>
<td>0% to 20%</td>
<td>2 times the height of the shrub</td>
</tr>
<tr>
<td>20% to 40%</td>
<td>4 times the height of the shrub</td>
</tr>
<tr>
<td>Greater than 40%</td>
<td>6 times the height of the shrub</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vertical Space</th>
<th>Minimum vertical space between top of shrub and bottom of lower tree branches:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3 times the height of the shrub</td>
</tr>
</tbody>
</table>

Adapted from: Gilmer, M. 1994. California Wildfire Landscaping

In some places it is adequate to only brush or clear or clean up an area. Brushing entails removing brush alongside a road or structure to keep the ground relatively open. Removal of all dead materials—shrubbery, branches, etc.—is especially important. The idea is to remove anything that is particularly flammable from anywhere near an ignition source, such as you, your kids, your car, or your house. When brushing or removing fuel ladders, focus on the fine or flashy fuel such as small sticks that will burn quickly.

If you remove the “kindling” around your larger fuel sources, chances are much greater those fuels will not ignite. When you are in your forest, make sure there are no concentrations of small sticks or brush right up against the trunks of trees.

Remember, defensible space and clearing does not mean that you denude or clearcut your property. Rather, your goal is to remove the most flammable materials. Balance your fire safety actions with general ecosystem health. Don’t disturb the ground around streams or you will cause erosion that will harm fish. If you have the good fortune to live along a stream or river with fish in it, make sure you stay at least 25 feet away from the stream in your clearing activities within these zones, further in the wildland zone. It’s OK to remove some or most dead vegetation there (like pruning in your garden). Don’t take out live vegetation, especially trees, near streams and rivers. Always maintain a dense shade canopy for the fish. Finally, many species of wildlife—such as bear, fox, bobcat, songbirds, and others—use streams as corridors in which to move from one area to another. Leave them some cover to be able to do this without disturbing you, or vice versa.

Defensible Space Fuel-Modification Treatment Prescription

- Increase the distance between the ground and the live crown of trees by limbing branches (both dead and live) on all leave-trees (i.e., “leave this tree”) within the circumference of the one-hundred foot defensible zone. For larger trees, limb the branches at least ten to fifteen feet up the tree. For smaller trees, don’t remove more than 1/3 of the live crown.
- When limbing larger branches, cut the limb in half, and then continue by cutting the remaining portion of the limb closer to the tree. Be cautious not to damage the tree trunk by cutting into the cambium layer. It is OK to leave branch stubs out from the tree. In some cases where aesthetics are not an issue, it is OK to leave portions of the branches sticking out as perches for birds. See pruning diagram in Background C.
- Reduce fuel connectivity and density in between individual shrubs and smaller trees by a minimum of ten feet. Thin from below within the drip-line areas of desired leave-trees to reduce ladder fuels.
- Reduce ground and surface fuels.
- In following all these steps, retain ecological integrity, and perform treatments in a manner that is sensitive to the landscape.

Much has been written on fire safety and defensible space issues. Several documents and/or references such as the Homeowner’s Checklist are contained in Background D. Remember, these treatments are for closer to your home. As you move further away from your home, your management objectives and actions will change. See Background C for more information on appropriate actions in the wildland.

B.1.1.5. Legal Requirements

California State Regulations

There are many legal regulations relating to fire safety and defensible space. Following are some of the most relevant and current state regulations.

Public Resources Code 4290

Public Resources Code (PRC) 4290 is a good summary of the basics of roads, driveway width, clearance, turnouts, turnarounds, signing, and water regulations related to fire safety. 4290 is usually enacted in legislation at the county level. Mendocino County has a good summary of 4290 regulations at [www.co.mendocino.ca.us/planning/PermitPlace/PermitPlace77.htm](http://www.co.mendocino.ca.us/planning/PermitPlace/PermitPlace77.htm). The following summary from the Sierra County Fire Safe Council and Community Fire Plan summarizes important actions for residents to take to meet 4290 requirements:

- Have proper identification of your home (street names and addresses) readable from a vehicle on the road.
- Maintain good access to your house for fire apparatus (wide enough for two vehicles to pass, built to carry at least 40,000 lbs., less than 15% grade, room to turn around, etc.).
- Provide adequate and reliable water storage (at least 2,500 gallons) with access for fire equipment.
- Use fire-resistant materials (metal, tile, or composition) for roofing.
- Enclose the underside of decks and balconies with fire resistive materials. 28

See Butte Fire Safe Council’s link: [buttefire.org/Fireprevention/protplan/PRC4290ininspectmast.pdf](http://buttefire.org/Fireprevention/protplan/PRC4290ininspectmast.pdf) for a good 4290 checklist.

Public Resources Code 4291

The State enforces basic fire prevention principles through PRC 4291. “4291” as it’s referred, regulates the amount of fuel you can have around your property. It is a good summary of the basics of fire-safing. It is the law that requires a minimum of 30 feet of defensible space. It was updated in September 2004 to expand some of the 30-foot defensible requirements to 100 feet. It states:

(a) Maintain around and adjacent to the building or structure a firebreak made by removing and clearing away, for a distance of not less than 30 feet on each side of the building or structure or to the property line, whichever is nearer, all flammable vegetation or other combustible growth....

(b) Maintain around and adjacent to the building or structure additional fire protection or firebreak made by removing all brush, flammable vegetation, or combustible growth that is located within 100 feet from the building or structure or to the property line or at a greater distance if required by state law, or local ordinance, rule, or regulation. 29

CAL FIRE is the agency that enforces 4290 and 4291. They have the legal authority to require you to meet these minimum standards. If you refuse to do so, they can do it for you and charge you for it. For many reasons, it is to your advantage to meet these minimum standards set forth in 4290 and 4291.

Government Code 51175

This code defines Very High Fire Hazard Severity Zones and discusses its implementation. This was a result of the 1991 Oakland Hills fire and the resultant “Bates Bill” (AB 337).
The purpose of this chapter is to classify lands in the state in accordance with whether a very high fire hazard is present so that public officials are able to identify measures that will retard the rate of spread, and reduce the potential intensity, of uncontrolled fires that threaten to destroy resources, life, or property, and to require that those measures be taken.\textsuperscript{30} CAL FIRE's FRAP is now using this information to:

"provide updated map zones, based on new data, science, and technology that will create more accurate zone designations such that mitigation strategies are implemented in areas where hazards warrant these investments. The zones will provide specific designation for application of defensible space and building standards consistent with known mechanisms of fire risk to people, property, and natural resources."\textsuperscript{31}

**Government Code 51189**

This code is a result of AB 1216 (Vargas) and directs the Office of the State Fire Marshal to create building standards for wildland fire resistance.

(a) The Legislature finds and declares that space and structure defensibility is essential to effective fire prevention. This defensibility extends beyond the vegetation management practices required by this chapter, and includes but is not limited to, measures that increase the likelihood of a structure to withstand intrusion by fire, such as building design and construction requirements that use fire-resistant building materials, and provide protection of structure projections, including, but not limited to, porches, decks, balconies and eaves, and structure openings, including, but not limited to, attic and eave vents and windows.\textsuperscript{32}

Information about Chapter 7A of the California Building Code (the WUI Building Standards) can be found at [osfm.fire.ca.gov/WUIBS.html](http://osfm.fire.ca.gov/WUIBS.html).

**Board of Forestry Regulations**

The Board of Forestry sets forestry and fire policy (overseeing CAL FIRE) for the State. In 2006, they adopted new defensible space guidelines.\textsuperscript{33} These guidelines implement PRC 4291 and are titled “General Guidelines for Creating Defensible Space.”\textsuperscript{34} A link to this document is found in Background D, or directly at: [www.bof.fire.ca.gov/pdfs/Copyof4291finalguidelines9_29_06.pdf](http://www.bof.fire.ca.gov/pdfs/Copyof4291finalguidelines9_29_06.pdf).

The Forest Fire Prevention Exemption (from AB 2420) allows exemption from Timber Harvesting Plans and other related permits for logging of merchantable\textsuperscript{35} trees for purposes of fire safety when several conditions are met, including potential projects identified in this plan. The link to this regulation is also found in Background D.

The harvesting of trees in compliance with PRC §4584(k), Forest Fire Prevention Exemption, is limited to those trees that eliminate the vertical continuity of vegetative fuels and the horizontal continuity of tree crowns, for the purpose of reducing the rate of fire spread, duration and intensity, fuel ignitability, or ignition of tree crowns....\textsuperscript{36}

The Mattole Restoration Council has a great summary and comparison of fire hazard reduction exemptions you can use for your fire-hazard-related forestry operations. See their “Forest Practice Rules for Thinning Exemptions,” at [mattole.org/pdf/Exemption_thinning_requirements.pdf](http://mattole.org/pdf/Exemption_thinning_requirements.pdf), and “Comparison of Thinning Exemptions,” at [mattole.org/pdf/fire_hzrd_exemption_comparisons.pdf](http://mattole.org/pdf/fire_hzrd_exemption_comparisons.pdf). They have also developed a model cost-share program to facilitate fuel hazard reduction on non-industrial private forestlands. For more information on that program, see [mattole.org/program_services/forestry/fuelsreduction.htm](http://mattole.org/program_services/forestry/fuelsreduction.htm).

**B.1.1.6. Fire Safe Building and Reducing Structural Ignitability**

How your house is constructed is equally important to creating defensible space. The law now requires fire-safe construction for new construction in communities in the wildland-urban interface.\textsuperscript{37} If you have a shake roof, your house is more likely to burn down from embers even if they have fire retardant; thus one of your first actions is to replace your roof. The roof is the most vulnerable part of your home to wildfires, during which firebrands\textsuperscript{38} can land in your roof's nooks and crannies and easily start a fire there. Once your roof covering ignites, chances are very good that the rest of your home will follow.\textsuperscript{39} Listed below are key issues of fire-safe structures:
• Shake siding on your house is much more prone to ignite than stucco or fiber or cement siding.

• Decks sticking out from your house act as kindling to your house for fires. If you have a deck, enclose the underside of it and your house (if it’s a post-and-pier foundation, but leaving screened ventilation). Do this either with solid building materials or with lattice and tight ¼” screen with green, fleshy, well-maintained plants. This will give you much more storage space as well, since it is unsafe to store anything (especially firewood or cardboard boxes) under your house if it’s open to the outside.

• If you have vents in your attic, make sure they are screened with ¼” non-corrosive metal (not vinyl). Enclose eaves, fascia, and soffits with screens. Embers can get into these places if they are not screened and burn your house down from the inside out.

• Make sure you have a ¼-inch mesh screen on all chimneys.

• Use double-pane or safety (tempered) glass on all windows.

For more information on making your home safe from wildfire, check out the University of California’s Homeowners Wildfire Mitigation Guide at groups.ucarr.org/IW MG/index.cfm, the new WUI regulations osfn.fire.ca.gov/WUBS.html, and “Is Your Home Protected From Wildfire Disaster? A Homeowner’s Guide to Wildfire Retrofit,” at www.firewise.org/pubs/is_your_home/WILDFR2.PDF.

The following information is taken directly from “Wildland-Urban Interface Ignition-Resistant Building Construction Recommendations,” generated by the 2004 Community Wildfire Protection Plan Workshops, the California Fire Alliance, and the California Fire Safe Council, compiled by Ethan Foote of CAL FIRE.

“One of the major objectives of wildfire control in general, and pre-fire management hazard reduction in particular, is to reduce the loss of life and property. The historical pattern of building loss during Interface fires indicates that vegetation fuel management must go hand-in-glove with ignition-resistant building construction to maximize the effectiveness of fire loss mitigation measures.

“Building loss and survival in the 1961 Bel Air fire, which destroyed 505 houses, was well documented. The report ‘Decision Analysis of Fire Protection Strategy for the Santa Monica Mountains’ found that 71% of the buildings with 26-50 feet of brush clearance survived the fire. However, the survival rate of buildings exposed to the fire increased to 95% for houses that had both brush clearance and ignition-resistant building construction (in this case non-wood roof covering). A similar pattern was seen on the 1990 Santa Barbara Paint fire.... (Source: California’s I-Zone: Urban-Wildland Fire Prevention & Mitigation, p. 120).

“On the Paint fire, which destroyed 479 houses and major buildings, the survival rate was 86% for houses with both non-flammable roofing and 30 feet of brush clearance. Only 4% of the 438 houses surveyed in the Paint fire survived where non-flammable roofing and 30 feet of brush clearance were absent. The modeling of structure loss and survival on the Paint fire revealed that brush clearance alone only ‘explained’ or accounted for 11% of the variation seen in the structure survival patterns. When brush clearance was combined with roof type in the model, and the effect of defensive actions was accounted for, the model explained 59% of the variability in structure loss.

“This is strong evidence that vegetation management alone will not be able to fully explain, nor mitigate, building loss on wildfires. Hence the need for the comprehensive approach in this plan, using a combination of vegetation management and addressing recommendations for ignition-resistant building construction. There is also strong evidence that this comprehensive approach will work to significantly reduce Interface losses. The Los Angeles Times (1 April 2004) reporting on the Southern California conflagrations of October 2003 clearly revealed the need for, and effectiveness of, combining vegetation management and ignition-resistant building construction for reducing building loss in wildfires:

‘Amid the ashes of the most costly wildfires in California’s history lies evidence of a crucial lesson: Fire-resistant construction and vigilant removal of flammable vegetation significantly improved the odds of a home’s survival, according to a Times analysis of fire records from more than 2,300 destroyed structures.
‘The impression left by an out-of-control fire racing through communities can be one of random destruction, with one house, or a whole block, burned to the ground and the next one spared for no apparent reason.

‘In fact, according to the Times analysis—which covered homes destroyed by the deadliest of the blazes, San Diego County’s Cedar fire—houses built since 1990 were far less likely to burn than those constructed in any previous decade. Houses built during the 1990s were damaged or destroyed at less than half the rate of houses built earlier.’

“The communities and homeowners covered by this plan have, for the past 40 years, had recommendations that can be (and have been) taken to reduce the ignitability of structures. An outcome of the 1961 Bel Air fire was publication of the ‘Fire Safety Guides for California Watersheds’ by the County Supervisors Association of California in 1965. These recommendations have been updated through the years. The current version of these ‘Fire Safe Guides’ is ‘Structural Fire Prevention Field Guide for Mitigation of Wildfires’ and can be found at osfin.fire.ca.gov/structural.html.

These recommendations for ignition-resistant building construction include:

- Roofing
- Eaves and Balconies
- Exterior Walls
- Rafters
- Windows
- Doors
- Attic Ventilation Openings
- Underfloor Areas

“In response to the persistent loss of life and property in wildfires, the most important of the recommendations is now a requirement. All new buildings, and significant re-roofing of existing buildings, in the communities covered by this plan are required to have ignition-resistant roofing (California Building Code §1503). The State of California is also in the process of promulgating changes to the state building code expanding the interface roof requirements and including new requirements addressing exterior wall construction, vents, and ancillary structures.”

These recommendations became law in 2003, work on the related Wildland-Urban Interface Building Standards have been completed and have recently been adopted by the California Building Standards Commission. For the latest information on these Standards, see osfm.fire.ca.gov/WUIBS.html.

B.1.2. Water Supply

The amount of water you have stored will have a significant impact on the ability to fight a fire at your home. 2,500 gallons of water storage for fire fighting is the minimum required for new construction. Storing water in the winter for use in the summer and fall and conserving water are both critical in this Mediterranean climate. There are many options available in terms of water tanks. Ideally, you should have a dedicated fire-fighting water tank, with a fire-ready standpipe, and a separate tank for domestic use. If you cannot do this, put your domestic water line out of your water tank in the middle of the tank, so you don’t accidentally drain your tank into the garden or elsewhere, keeping the bottom half for emergency use. Combined water storage is allowed as long as the minimum 2,500 gallons for fire department use is always maintained. Typically, this requires plumbing the domestic water flow line above the 2,500-gallon mark of your tank.

Your fire water line should be a two- or four-inch line, buried 12-18 inches below ground. An above-ground plastic water line will likely burn in a fire, but a full plastic water tank probably will not. Put a metal standpipe at the end of the water line with a 2½ inch fire hose threaded adapter so firefighters can quickly attach to your water source. Fire hose thread is known as national thread, national standard, NST, NSFH, NH, or FHT. All the local wild land fire agencies prefer NSHT fire hose.

Your water tank can be located anywhere on your property. However, the fire department connection must be located no closer than four feet and no further than twelve feet from the roadway. Make sure that your standpipe is somewhere a fire truck can access it and turn around to leave. If it’s not accessible, it’s not going to be very useful. The roadway must be wide enough to accommodate the fire apparatus without blocking it. Fire engines generally need 12 feet wide by 15 feet high clearance, and a 60-foot T or 40-foot circle to turn around for safe retreat. Finally, make sure your local firefighters know where your tank is exactly located, before any fires.
In an emergency, swimming pools and ponds provide a great source of water. Firefighters can draft directly from these sources if they can get close to them. If you are going to depend on this water as your first response to a fire, you will need a pump and a generator for back-up. Often when there is a large fire the power will go out. Therefore, the generator will be needed to pump water from your pool or pond.

While ponds are ideal for storing large amounts of water for fire fighting, they must be properly sited to avoid erosion. Ponds built on unstable ground can give way, leading to large washouts and gullying, choking streams with sedimentation, in turn harming fish habitat. Ponds should be built on stable ground, have adequate overflow protection, and should not be built across seasonal or perennial creeks. Also, please remember that ponds can breed nuisance species such as bullfrogs, mosquitoes, and non-native fish that can harm native salmon and steelhead.

There are more and more options for inexpensively storing water. Cisterns—a catchment to collect rainwater—are becoming increasingly popular. Several websites describe how to make one yourself—start with a search for “cistern.” Low-cost water tanks are also available. The easily transported Pioneer Tanks from Australia are now seen throughout the US (www.pioneertanks.com.au).

The use of gray-water systems is an alternative method for watering yards and vegetation to conserve your water. A gray-water system is where water is collected after a non-contaminating use such as the kitchen sink or washing machine, and stored and used for irrigation. For more information on safe and sanitary gray-water systems, see www.oasisdesign.net/greywater/ or www.greywater.com/.

### B.1.3. Roads and Access

Roads are critical components in the fire equation. They are a great place for a fuelbreak. They are also critical for evacuation and for firefighters to reach your home. As mentioned above, minimum clearance requirements along your roads for a fire engine to safely pass are 12 feet wide by 15 feet high, in addition to fuel reduction treatments of at least 15 feet on both sides of the road. You also need plenty of places on the road where vehicles can pass each other, i.e., adequate turnouts properly designed and spaced along your access road or driveway. If a wildfire is threatening and a fire engine is trying to get to your residence or business while you’re trying to evacuate, there need to be areas in the road wide enough to accommodate traffic from both directions. Remember, when a wildfire is threatening, chances are it will be very dark and smoky, thus very disorienting. Take the time now to make it easier on yourself should that event actually occur.

A fire engine needs to be able to turn around to leave. If they cannot safely get the engine in and out, that makes your home less defensible. As most firefighters will not and should not unnecessarily risk their equipment or lives to protect your property. Firefighters will almost always turn around immediately when they arrive to a fire for safer and quicker escape.

This is good advice for you too. Get in the habit of parking your vehicles facing out at home so you can leave quickly if necessary. If you have locked gates, they will very likely be cut by firefighters. If you don’t want to have to happen, make sure you leave your gates unlocked. If you have electric gates, make sure they have a back-up power source or other way to open when the power is out, which is likely during a large wildfire. Additionally, bridges need to be evaluated for safe fire truck passage as per PRC 4290. Generally, if a propane or other fuel or water truck can make it across the bridge, then a fire truck can. If you have a bridge that will not safely carry a fire engine, you must contact your local fire department and let them know. Don’t make their job any more dangerous than it already is. Instead, help them to help you.

Finally, many private dirt roads can become nearly impassable after a rough winter. Maintaining your dirt and gravel roads is important for many reasons, including not only keeping dirt out of streams, but ensuring a safe evacuation in an emergency. If several households share the same road, consider rotating the responsibility for coordinating road maintenance every few years. The identified coordinator can collect an agreed-upon annual assessment from all those who regularly use the road, and organize the maintenance.

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43 Fuel Treatments along Roads and Driveways

Fuel treatments along driveways and road systems should be considered a strategic high priority. While ecological concerns regarding vegetation types will be considered, fuel reduction will be the primary management objective. The main objective for ingress-egress corridors is to create a defensible perimeter along and adjacent
to all roads and driveways. These access routes are also where a fire would decrease in intensity and provide safer access opportunities for fire-suppression activities by firefighters.

Roads can be a potential ignition source for wildfires (from vehicles and people). When treated, they serve important functions as natural fuelbreaks, and also anchor points for tactical fire-suppression activities. Thus, treatment of these areas is a top priority in any fuel management strategy. Treatments along these driveways and road corridors will also benefit multiple landowners in the event of a wildfire; thus they provide an opportunity for community planning and collaboration. The neighbors who use these travel routes to access their homes can also be educated on the importance of fuel-reduction activities in the event of a wildfire evacuation scenario.

**Roads and Driveways Fuel Modification Treatment Prescription**

- Retain larger trees while aggressively thinning understory vegetation in the area 100 feet from roads and driveways.
- **High-Prune** all branches that are hanging over the road up to 15 feet above the ground.
- Reduce standing dead trees (snags) directly along roadways. Some dead standing trees may be retained by reducing the height of the snag to 12 feet, through tree surgery work; accomplished by climbing, topping, and chunking-down sections.

**B.1.3.1. Signage and Addressing**

Chances are firefighters are not going to know where you live, especially in the case of a large fire where out-of-town firefighters are present. Make sure you have a visible road and address sign. If you have a visible address sign on your house and/or driveway and a road sign at the street, emergency service personnel (fire, ambulance, police) will likely find it. If not, they may not. Work with your local fire department if you have specific questions regarding how to do this most effectively and to their standards. Your sign should be of reflective material so that it is visible at night and non-flammable (metal on metal post). If you want emergency personnel to be able to find you, do your part. In a medical emergency a few minutes may be the difference between life and death.

Not only is this a smart practice, it’s the law. In the California Code of Regulations, Section 1270 Title 14: SRA Fire Safe Regulations, Subsection 1274 states:

To facilitate locating a fire and to avoid delays in response, all newly constructed or approved roads, streets, and buildings shall be designated by names or numbers, posted on signs clearly visible and legible from the roadway. This section shall not restrict the size of letters or numbers appearing on street signs for other purposes.

It goes on to further say that the letters must be at least 3” high and 3/8 stroke, reflective, and of a contrasting color to the sign background. Additionally, they need to be visible from both directions for at least 100 feet.

A number of Sierra communities have already accomplished this easy, inexpensive, task to fix an existing problem. Often local fire departments buy the supplies and make the signs to sells to homeowners.

**B.2. During the Fire**

Fire can be extremely frightening. However, taking steps now to prepare you, your family, and your home will make it easier to survive a fire, and it will likely reduce panic and help you to effectively deal with the situation. Even the most organized of us will forget something when a crisis moment arrives. Create easy-to-follow checklists for your family to use to safely survive a wildfire.

Figure 3 on the following page, from “Living with Wildfire,” Pacific Northwest Wildfire Consulting Group (pnwfireprevention.com/LWF/Livingwithfire.pdf), can be copied and posted somewhere prominent in your home or with your emergency preparedness kit. It is a great summary of what to do when fire strikes.

*Figure 3. When Wildfire Approaches Checklist* (next page)
WHEN WILDFIRE APPROACHES

Should homes be threatened by wildfire, occupants may be advised to evacuate to protect them from life-threatening situations. Homeowners, however, do have the right to stay on their properties if they so desire and so long as their activities do not hinder fire-fighting efforts. If occupants are not contacted in time to evacuate or if owners decide to stay with their homes, these suggestions will help them protect their properties and families.

☐ Evacuate, if possible, all family members not essential to protecting the house. Evacuate pets as well.
☐ Contact a friend or relative and relay your plans.
☐ Make sure family members are aware of a prearranged meeting place.
☐ Tune into a local radio station and listen for instructions.
☐ Place vehicles in the garage, have them pointing out, and roll up windows.
☐ Place valuable papers and mementos in the car.
☐ Close the garage door but leave it unlocked. If applicable, disconnect the electric garage door opener so that the door can be opened manually.
☐ Place combustible patio furniture in the house or garage.
☐ Shut off propane at the tank or natural gas at the meter.
☐ Wear only cotton or wool clothes. Proper attire includes long pants, long-sleeved shirt or jacket, and boots. Carry gloves, a handkerchief to cover face, water to drink, and goggles.
☐ Close all exterior vents.
☐ Place a ladder near the house so firefighters have easy access to the roof.
☐ Make sure that all garden hoses are connected to faucets and attach a nozzle set on “spray.”
☐ Soak rags, towels, or small rugs with water to use in beating out embers or small fires.
☐ Inside, fill bathtubs, sinks, and other containers with water. Outside, do the same with garbage cans and buckets. Remember that the water heater and toilet tank are available sources of water.
☐ Close all exterior doors and windows.
☐ Close all interior doors.
☐ Open the fireplace damper, but place the screen over the hearth to prevent sparks and embers from entering the house.
☐ Leave a light on in each room.
☐ Remove lightweight and/or non-fire-resistant curtains and other combustible materials from around windows.
☐ If available, close fire-resistant drapes, shutters, or Venetian blinds. Attach pre-cut plywood panels to the exterior of windows and glass doors.
☐ Turn off all pilot lights.
☐ Move overstuffed furniture (e.g. couches, easy chairs, etc.) to the center of the room.
☐ Keep wood shake or shingle roofs moist by spraying water. Do not waste water. Consider placing a lawn sprinkler on the roof if water pressure is adequate. Do not turn on until burning embers begin to fall on the roof.
☐ Continually check the roof and attic for embers, smoke, or fire.

If a fire should occur within the house, contact the fire department immediately. Continue to inspect your house and property for embers and smoke.

Most importantly, STAY CALM!

Conserve your water. Save it for when the fire is at your house, or the fire has passed. This is when you may need it to put out any embers or sparks. Remember that if the power goes out and you use a well system with a pump, you won't have water unless you have a backup generator. Therefore, fill bathtubs and any available
containers to store water. Make sure that all backup generators have an approved crossover switch, installed by a Licensed Electrician so that when the power company is fixing downed lines, you don’t kill a lineman with your generator.

If you have any experience or training in fighting fire, create a fire-fighting tool area that is easily accessible. Keep this in a non-flammable structure, such as a metal shed or your garage. Your collection should include tools such as shovels, hoes, Pulaskis, McLeods, etc. Keep a set of fire-fighting clothes there as well, including heavy cotton or wool clothing and leather boots and gloves. Put a fire hose at your water source and mark it well so you, your neighbors, and/or firefighters can easily find and use it.

Another very important thing you can do to protect your property in the case of a fire is to be fully prepared for the eventualty of fighting a fire at your home. Create a map of your property that shows where the most valuable structures and other resources are. Mark on your map the location of your water sources, where your gas/propane/diesel tanks and shut-offs are located, and any other highly flammable or explosive materials. Include locations of any locked gates and the combinations to those gates. Also include locations of any pets or livestock. Put your name, phone number (and/or CB handle), street address, and parcel number or GPS® coordinates on this map. Put a copy on the wall by a phone (or CB radio), with the number of your local fire department so you can use it in case of an emergency. If you desire, put it up somewhere near the entrance to your property where firefighters can see it, perhaps with your visible fire-fighting tools. Check with your local fire department to see if they want a copy. Or better yet, invite them out to your property (not during fire season) to review this and show them where everything is. This will help them effectively protect your property in case of fire. If you are concerned about security issues, you can talk to your local fire department to work out a compromise that will meet your confidentiality needs while making their job easier to defend your property if and when the day comes.

Remember to call 911. In the midst of the excitement and panic of a fire, and attempts to extinguish it, it is possible to forget to call 911, which alerts firefighters. Should the time come that you do have to call 911, give your address (which must be visibly marked on the road so firefighters can find your home) or GPS coordinates if you have them. If you live in a remote area, tell the dispatcher at 911 the name of the closest local fire department, if you are absolutely certain of it, as dispatchers are often located in more urban areas and may not know your local geography.

After you call 911, go to the bottom of your road, and either have someone stand there or put up a non-flammable flag or some sign to let firefighters know where the emergency is and the way to your house. The easier you can make it for the firefighters, the greater your chance of surviving a fire.

B.2.1. Evacuation

Be ready if you need to evacuate. Have everything you need packed beforehand. Some residents in high fire-risk areas move their valuables to a safer location during fire season. Identify alternate evacuation routes and drive them now so you know them well. Do this in the dark too so you will be comfortable during a large fire, where visibility can be very low. Know at least two ways out. Make sure you are comfortable with both routes. Have keys or combinations to locked gates in your vehicle. Turn on your headlights, and drive SLOWLY and carefully. There could be many people trying to leave and/or firefighters and other emergency service personnel trying to enter to protect you and your house. Sometimes your safest or quickest evacuation may be on foot. Know those routes too; make sure your friends, family, and local firefighters know that you may be on foot during a wildfire. For more information on evacuation, see CAL FIRE’s evacuation information in Background D.

B.2.2. Shelter in Place

The safest place to be in a fire may be in your house. In Australia and New Zealand, people are recommended to stay at home. Their motto is “Prepare, Stay, Defend.” Their fire protection strategies are developed around this plan. Many people die trying to evacuate, far more than die from the fire itself. This policy has been questioned after the 2009 fire season where people were killed by a wild land fire. The local wild land fire agencies do not recommend sheltering in place in Midpines. If you are at your home, you can put out any small fires that start around your property from embers and sparks, which can travel over a mile from a large fire. This is the concept of “Shelter in Place.” You should only shelter in place at your home if you have good defensible space there and are prepared to stay for whatever length of time necessary. Often an area is designated for evacuation days before the fire actually gets there due to the potential for a rapid fire advance. If you decide to shelter in place and then (for example) leave for provisions two days into the evacuation order (because the fire is still not there), you may
not be able to return. Law enforcement often closes an area for entry once an evacuation has been ordered. Therefore, to shelter in place you must also consider logistical issues such as water, sewer, electricity, etc., for the duration of your stay.

Don’t be surprised if fire fighters are hesitant to let you shelter in place. Residents often do not have the proper equipment or training to do this and liability issues can arise. It is often very difficult to know what the right thing to do is as the fire approaches. Be prepared. Talk to your local fire fighters now to develop a plan.

B.2.3. Safety Zones

If you are unable to evacuate by road, know where your nearest “safe or safety zones” are. (Safe zones are identified on each community map in Project File 2). A safe zone is where you can go (other than your house) to shelter in place. These are locations where you and your family can survive a fire without any special equipment or clothing if your home is not safe (although your home is often your safest place). Safe zones are also used as staging areas but usually do not provide any services. Steep creek channels are not a good place to seek refuge, as fire travels faster in steep canyons. The fire will consume the oxygen there ahead of the flames and you could suffocate before the fire arrives. Instead look for big open fields, large river bars, wide-open gravelly or paved roads, or an open area that has already burned. This area should be four times wider than the fire’s flame lengths (see the fuel models for various vegetation types in Appendix 3 for typical flame lengths). Talk to your local fire department about potential safe zones, and see the map for each community in Project File 2, so that you are familiar with the area now.

Safe zones for residents are different than those for firefighters. Do not attempt to shelter in a firefighter safety zone if you are not actively fighting the fire.

If an evacuation is ordered or you are sent to a safe zone, you will be notified of where to go by local law enforcement. Some safe zones may be used as the Emergency Operations Center and hence should be avoided so as not to interfere with the success of fire-suppression efforts.

B.2.4. Preparing Pets and Livestock

If you have pets and/or livestock, take the time now to plan for how best to ensure their survival. The following text of a brochure, “Disaster Preparedness for Dog and Cat Owners,” is from the California Department of Food and Agriculture. Similar brochures are available regarding birds, horses, and livestock. These can all be found at: www.cdfa.ca.gov/ahfss/ah/disaster_prep_Brochures.htm.

With a little advance planning, you can save your pet’s life in a disaster.

Before

PLAN AHEAD. In the event of an evacuation, pets may not be allowed inside human emergency shelters. Determine the best place to leave your pet in case of a disaster. Identify an off-site location as well as a place in your home.

IDENTIFICATION AND PHOTOGRAPHS. Dogs and cats should always wear properly fitting collars, personal identification, rabies, and license tags. Make sure all the information on the tags is current. Keep a current photo of each pet. Make sure any distinguishing markings are visible. You will need proof of ownership to retrieve your pet from a shelter.

DISASTER KIT. Maintain a disaster preparedness supply kit for each of your pets.

PAPERWORK AND RECORDS. Store important animal documents in a zip-lock or waterproof plastic bag. These should include vaccination and medical records.

VACCINATIONS. Your pets need to be current on vaccinations. You will be required to show proof of vaccination if you need to board your pet.

TRANSPORTATION. Each animal should have their own pet carrier. Familiarize your pet with the carrier or cage before an emergency.

LEASHES AND COLLARS. Keep a leash handy for each dog and cat in your home. Consider using a harness.

BUDDY SYSTEM. In case you are not home when disaster strikes, ask a trusted neighbor to check on your animals. Exchange veterinary information and file a permission slip with your veterinarian authorizing them to get emergency treatment for your pet if you can’t be located.
During

**IF YOU TAKE YOUR PET:**
Evacuate your pet early, if possible.
Take your disaster preparedness kit, including the pet’s vaccination and medical records, as well as identification photographs.

**IF YOU CAN’T TAKE YOUR PET WITH YOU:**
Bring your pet indoors. Do not leave pets chained outdoors.
Prepare a pre-selected site indoors for your pet. Use a room with no windows but adequate ventilation, such as a utility room, garage, bathroom, or other area that can be easily cleaned. Do not tie them up.
Leave only dry foods and fresh water in non-spill containers. If possible, open a faucet to let water drip into a large container or partially fill a bathtub with water.
Do not leave vitamin treats, which could be fatal if over-eaten.
House cats and dogs separately, even if they normally get along.

**What about pets other than dogs and cats?**
Plans for birds and reptiles can be found in the brochure: Disaster Preparedness for Bird and Reptile Owners
Small mammals, or pocket pets, should be transported in carriers suitable for maintaining the animals while sheltered. Remember to take bedding materials. Keep animals in a quiet, safe place.

**After**
Pet behavior may change after an emergency. Monitor your pets closely and keep them leashed. Familiar scents and landmarks may be altered, causing confusion and abnormal behavior.
Be aware of downed power lines, fallen trees, debris, and local wildlife.
If you find a pet, call animal control or any emergency phone numbers set up after the disaster. Isolate it from your animals until it is returned to its owner, or can be examined by a veterinarian.

**IF YOU’VE LOST YOUR PET:**
Visit each shelter in your area at least once every other day. You must check the shelter in person; you are the only person who can truly identify your animal. Keep a current photo of your pet showing or describing any distinctive markings.
Create a flyer with your pet’s photo and description, pet’s name, your name and phone numbers where you can be reached.
When you do find your pet, immediately examine it for illness or injuries. Obtain medical attention from your veterinarian if needed. Use caution when handling animals. Panicky or injured animals may bite.

**Practice Your Plan!**

**Disaster Preparedness Kit**
- Pet carrier or cage for each pet
- Two-week supply of food and water
- Non-spill food and water bowls
- Medications and dosing instructions
- Pet first-aid kit
- Vaccination and medical records
- Your veterinarian’s information
- Cat litter box and litter
- Newspaper
- Plastic bags for waste disposal
- Paper towels
B.3. After the Fire

As a landowner living in the Sierra Nevada—where the ecosystems are naturally prone and dependant on frequent wildfires—there is a good possibility that a fire may eventually occur on your property. If fuel modification measures have been taken prior to the fire, the intensity of the fire will likely be less severe. Regardless of whether you have performed fuel hazard treatments or not, varying degrees of land restoration and post-fire impact mitigation measures may need to be taken. After the fires are finally put out or have burned out, the important step of healing the land will need to take place.

If a fire does occur on your land the first post-fire step is to assess how severe the fire burned. Did the fire burn at a low, moderate, mixed, or high severity? In certain situations, such as with low fire intensity, wildfire may have achieved very positive results to reducing your fuel loads and benefiting natural processes. This includes burning through the understory and occasionally scorching individual trees, but not becoming a crown fire. In addition to reduced fuel loads, the wildfire may have performed a great service by increasing the structural diversity on your land and achieving great benefits to the local ecology and wildlife habitat through snag creation.

"Fire-killed snags and logs serve vital roles in the structure and function of healthy forest ecosystems in general, and are especially important for natural recovery processes following fire events. They provide food and shelter to wildlife, fish, and numerous insects, microbes, and fungi that are vital to post-fire recovery and long-term site productivity, they help retard surface water runoff and help retain and build soil, they help cycle nutrients and water to plants and soil, and snags that fall across streams provide links between terrestrial and aquatic ecosystems."

Wildfires that burn at high intensity can negatively affect soils and kill all of the overstory trees. This is known as a stand replacement fire. Moderate and mixed severity fires will burn hot in certain locations and these locations may need some restoration. Often, post-fire restoration efforts will focus on mitigating the impacts of fire suppression activities such as back burns and the firebreaks created by heavy equipment during emergency fire fighting. If a wildfire has burned through your property without fire suppression activities having taking place, the end result of that fire may be a positive one; nature may accomplish its own healing process with a little bit of assistance from you.

Wildfires that have burned at high severity may have dangerous adverse effects to watershed health and pose extreme safety issues to local communities. Water erosion is one of the main concerns. Mountainsides that are completely burned, with all of the trees and vegetation gone, will not have the ability to hold back or absorb water (e.g. rain). Burned up hillsides may turn hydrophobic, where the ground is sealed and repels water instead of absorbing it. In these situations the potential for catastrophic events like landslides—where entire hillsides can turn to liquid and move downslope—are possible.

In addition to slope instability, invasive species can take hold after fire, changing the ecological balance for decades. Areas in the eastern Sierra are more prone to this type of weed invasion. Species like cheatgrass, an annual weed, will take over and out compete native grasses and plants. Once established, cheatgrass increases future fire risk as it is highly flammable and carries fire very well; this increases the likelihood of more fires and in turn more weeds to perpetuate this cycle long into the future.
One techniques for rehabilitating soils after a fire is to break up hydrophobic soils by raking or mulching charcoal into the ground to help soak up water. Other activities include native grass seeding to mitigate against invasive weed invasion, planting trees and shrubs, and other short and long term erosion control efforts.

Following a fire on your land it is recommended that you consult with trained resource professionals. Sometimes a team of specialists including hydrologists, geologists, soils scientists, botanists, foresters, and engineers may need to be consulted to assess the impacts the fire may have caused and give you direction regarding how to develop a restoration plan to start the healing process. In addition to their advice, it is also good to consult with an ecologist to review your restoration plan. Often activities such as salvage logging[3] that some natural resource professionals consider to be restoration can actually set the cycle of ecological recovery back by inflicting more damage on the land.

Directly following a fire the land is at its most sensitive, and in an unstable state. Therefore, very careful consideration will need to be taken to ensure your actions will benefit its recovery.

For more information, see "After the Burn," www.cnr.uidaho.edu/extforest/AftertheBurnFINAL.pdf.

B.3.1. Assess Your Situation

In the 2004 summer fires in Shasta County, some homes were threatened that had burned only a few years before. Just because you live through a fire does not mean it couldn’t happen again. Learn from the experience to be better prepared next time. The following article from Forestland Steward was published after the 2003 Southern California firestorms.

"Post-fire response: assess your situation

Although we all know that the California landscape is adapted to burn, we are seldom prepared for the reality of a large wildfire. The effects of a fire will have consequences for years. Approach the post-fire period thoughtfully. After a fire, there are important decisions to be made. What should you be concerned about and what needs to be done? The wrong choices could lead to problems down the road, so take some time to assess your situation before taking any action.

Areas of concern:

The homesite
- Damage to the home or other structures
- Loss of landscaping
- Hazardous trees or vegetation
- Danger of flooding, on-site sedimentation
- Drinking water quality and other environmental impacts

The landscape
- Safety hazards—trees, power lines, etc.
- Regeneration and recovery
- Wildlife habitat
- Watershed functions
- Erosion concerns
- Condition of remaining vegetation

Streams
- Proximity to home, roads, other facilities
- Hydrologic connectivity of existing drainage facilities
- Potential of increased woody debris load, streamflow, flooding, debris flow
- Need for treatments to upper watershed to minimize downstream impacts, impacts to property

Roads
- Existing problems that may be exacerbated by wildfire effects
- Damage to stream crossings, culverts
• Gullies, potholes, fillslope failure, cutslope failure, sediment deposits, wet spots
• Potential for culvert obstruction and diversion.\footnote{54}

Furthermore, if you are in the unfortunate situation of losing your home to fire, learn from the fire in terms of what areas burned around your property versus those that didn’t. Design your new fire-safe landscaping with this in mind. Perhaps most importantly, build or rebuild your home with fire-resistant materials, as described in section B.1.1.6 Above.

### B.3.2. Developing and Implementing a Restoration Plan

After a wildfire has burned through your property you will need to perform an assessment of the impacts the fire caused and what measures you will need to take to restore and mitigate the damage. Similar to developing a fuel treatment prescription you will need to develop a Post Wildfire Recovery Plan which will outline the priority areas on your property to begin work, and the sequence, schedule and timing that work will follow. Post fire restoration activities are aimed to focus on mitigating increased ecological damage and safety concerns for your homesite, and road infrastructure.

#### Where to Begin?

**Immediate and Long Term Needs**

In the development of your restoration plan, prioritize both immediate needs and longer term actions. Immediate needs relate to seasonal time lines and activities that need to occur right away for both human safety and the mitigation of ecological impacts. Following a wildfire you will need to be thinking about the fall rains or snow that are on the horizon. In an effort to mitigate slope slides and erosion issues your first step will be to stabilize these areas. Roadway infrastructure, homesite, and riparian areas are other immediate areas restoration.

Long-term actions are the recovery work you will do over time. Restoration is a process and not a one-time occurrence. Planting trees, shrubs, and native grasses can happen immediately, but are part of long-term restoration activities. Maintaining fuels by limiting resprouting is another long-term effort.

**Restoration Plan Mapping and Layout**

Following the fire, consult with natural resource professionals to help you assess the damage. Get an aerial photograph of your property and designate zones for restoration priorities (try Google Earth for a free aerial picture, earth.google.com/). With this photo and subsequent map you can define the areas that burned the hottest, need immediate restoration, need long-term restoration, and project locations of greatest concern. This map will relate to a written plan that describes the restoration activities that will take place. Using GIS/ GPS tools and technology can be extremely helpful to accomplish this activity.

#### Developing a Restoration Priority List

**Priority #1: Roads, Driveways, Homesite, and Steep Areas**

In order to undertake restoration work you will need access to your property. Following a wildfire, weakened trees can fall across roads and may threaten driveways and road systems. Ensure the safety of ingress and egress by removing these trees.

Slope movement from a high intensity fire followed by rains can cause slides above and below roads. Stabilize these areas with erosion control methods. Trees that have burned and been scorched can pose safety issues along roads. These trees can be used to stabilize road banks by contour falling them (see Background C for descriptions). You can accomplish several goals with one activity. In restoration we call this stacking functions.\footnote{55} In this situation you can increase the safety for travel along your driveway and in turn use the trees to hold the slopes in place.

If the fire burned hot within one hundred feet of your home you will need to take measures in this area for increased safety. If you have steep slopes below or above your house, perform safety mitigation work and erosion control. If your homesite is directly above your neighbors on a steep slope, prioritize developing a mitigation plan for these areas.
Priority #2: Streams, Riparian Areas, and Sensitive Habitat Areas

After you have ensured safety and access is available to perform restoration activities, focus on mitigating impacts to any streams. In an effort to prevent sedimentation from erosion into streams, it is critical for your efforts to focus attention on these locations. In addition to riparian areas and streams you will want to be thinking about the upland slopes above stream corridors.

If you have identified important wildlife corridors, sensitive habitat zones, and ecologically significant locations, you will want to focus your attention on these places.

Priority #3: Remaining Wildlands

Following restoration treatments of the priority areas described above, focus the rest of your restoration activities on the long-term recovery of the wildlands you are fortunate enough to steward.

It is important when planning your post fire restoration efforts that you focus your attention on areas that most need it. Following the fire some areas on your property may be fine left alone for natural recovery. Ultimately the natural world will heal itself; what we are attempting to do is assist that recovery and mitigate further damage without causing additional problems. When developing your restoration plan take into account each location and what its specific needs are. Directly after a fire things look charred and heavily impacted, however new life is on the horizon and will rise from the ashes.

B.3.3. Make a Plan to Be Better Prepared Next Time

Living through a wildfire can be a life altering experience. There is no other wake-up call quite like a wildfire. You will likely learn many new things about where you live and probably about who you are.

When replacing structures and/or landscaping after wildfire, use defensible space concepts like those outlined in this document to help you design a more fire-safe home. If you have to start from scratch, think about siting possibilities. Where are those places on your property that burned less or not at all? What about putting your house there now? Look at the places on your property or in your neighborhood that survived and try to understand why. Talk to your neighbors about how their places survived and what they learned. Mimic those features that lead to survivability in the other places on your property that did not fare so well. If you improve your understanding of your local landscape and how it reacts to fire, you can improve the survivability of your home and your ability to plan for future fires.

Homes don't have to burn in a wildfire. We know what causes a fire to spread and homes to ignite. We have the knowledge to make them survivable, even in the absence of structure protection (fire fighting) resources.

Finally, a few closing words from Dr. David Horne. David has been active with the Greater Laguna Fire Safe Council since he lost his home to wildfire:

"Though it may be difficult, try to avoid spending energy on blaming someone or group or agency or fate that "caused" the wildfire to happen. Distance yourself from the doom-and-gloom personalities that will emerge to spread their message of sorrow. You only have so much personal strength and you will need it for the recovery phase in a post-incident situation. Think positively, talk positively, and act positively about the future. Concentrate on regeneration prospects and rebuilding your homes, neighborhoods and community to be even better than before. Be a positive example of the incredible resiliency of the human spirit that will inspire your loved ones and others to pitch in to move forward with confidence and assurance. You can do it!"56

1 Most of this document was written by Tracy Katelman, ForEverGreen Forestry (www.forevergreenforestry.com) and Marko Bey, Lomakatsi Ecological Services, Inc. (www.lomakatsi.org). Please credit appropriately.
2 Surface Fuels: Materials on the ground like needles or low-growing shrubs that provide the fuel for fires to spread on the ground. Surface fuels are generally considered all fuels within six feet of the ground.
Canopy: The top layer of a forest or tree, which is formed by leaves, needles, and branches creating a continuous cover.

Crown Fire: A fire that spreads from treetop to treetop, and is characteristic of hot fires and dry conditions. Crown fires are generally more complex to control than fires on the surface.

Ember: A piece of wood or a coal that is hot and glowing from fire activity, often dispersed by wind ahead of a fire. Also called firebrands.

Spot Fires: A smaller fire outside the boundary of the main fire, started by airborne sparks or embers.

California now requires one hundred feet defensible space around your home, or to your property line; it used to be thirty feet. It may be necessary (although not legally required) to extend this space up to two hundred feet, depending on local conditions.

www.fs.fed.us/r2/fio/dict.htm


El Dorado County Fire Safe Council, www.edcfiresafe.org/fire_safe_vegetation.htm


Feathering: A process that reduces the appearance of change between treated and untreated sites by gradually softening the transition.

Patch Under-Burns: A designated area, or vegetation patch, where fire is utilized to consume surface fuels but not trees and shrubs.

Fuel Ladder: A ladder of vegetation from the forest floor into the canopy (or upper branches) of the trees that allows fire to climb upwards.

Fuel Continuity: The amount of continuous fuel materials in a fire’s path that allows the fire to extend in a horizontal or vertical direction.

Limb Up: To remove the lower branches from a woody plant to create a defined space between the forest floor and the canopy.

Limbing: Removing selected branches of a standing or fallen tree.


Brush: To control and/or clear small woody debris.

Brushing: The act of removing brush such as dead materials, shrubbery, and branches.

Flasy Fuel: AKA fine fuels, such as grass, leaves, pine needles, ferns, moss and some kinds of slash which ignite readily and are consumed rapidly when dry.

Leave Trees: Trees that have been selected to remain standing in an area of thinning or harvesting.

Drip-Line: The boundary of a tree’s canopy, generally estimated by the extent of the tree’s outermost limbs and the circular moisture line formed when rainfall drips from the limb tips.


PRC 4291 www.leginfo.ca.gov/cgi-bin/waisgate?WAISdocID=32907529051+0+0+0&WAISSection=retrieve

California Government Code 51176.

fnsp.pdf.ca.gov/projects/hazard/hz.html

California Government Code 51189, section a.

www.bof.fire.ca.gov/pdfs/DefensibleSpaceRegulationsfinal12992_17_06.pdf

www.bof.fire.ca.gov/pdfs/Copyof4291finalguidelines9_29_06.pdf

Merchantable: Timber that is viable for sale under the current economic situation. This is generally determined by the part of the stem (trunk) that is suitable for timber products.

www.bof.fire.ca.gov/pdfs/AB242010_28_05.pdf

California Health and Safety Code section 13108.5.

Firebrands: A piece of wood or a coal that is hot and glowing from fire activity, often dispersed by wind ahead of a fire. Also called embers.


Draft: Using the forces of suction to draw water from ponds, swimming pools, or other bodies of water. This technique utilizes a partial vacuum formed by a suction pump and atmospheric pressure. The water is then moved where it is needed.

42 Fuelbreak: A strategic area where fuel volumes have been intentionally reduced to slow down a fire and reduce its flame lengths and intensity; as distinguished from fire breaks where all fuels are removed to bare mineral soil for fire suppression.

44 Ingress-Egress: Roads and other avenues to enter and leave your property. The act or right to come in, or go through as in entering a property (ingress). The act or right to, depart or go out as in exiting a property (egress).

43 Anchor Points: The point at which firefighters begin fire line construction, usually blocked from the spreading fire to protect firefighters from harm.

41 High-Pruning: Cutting of both the dead and live branches ten to fifteen feet from the base of the tree (height to live crown). This is done on larger trees to separate the fuel connectivity from the ground to the crown of a tree.

47 osmn.fire.ca.gov/pdf/fireengineering/structural/AppendixL.pdf, pp. 15-16.


49 Not a wooden ladder! Put it on the ground near the house so it does not act as a fuel ladder for the fire to climb up your house.

50 Global Positioning System: A hand held navigational device that uses satellites to determine positions on the earth.


53 Salvage logging: Logging and removing merchantable trees after a fire to capture economic potential. This is a very controversial subject.


55 Stacking Functions: The act of accomplishing several goals with one activity.