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1. The Lake County Community Wildfire Protection Plan

1.1. Plan Purpose

The Lake County Community Wildfire Protection Plan is a project of the County of Lake and the Lake County Fire Safe Council (LCFSC).

The purpose of this Community Wildfire Protection Plan (CWPP) is:

- To identify priority projects that reduce risks and hazards from wildfire while protecting conservation values in Lake County, California. Goals are to be achieved principally through prioritization and implementation of fuel hazard reduction, community education, and fire-protection projects and activities.
- To provide community priorities for conservation-based fuel reduction on public lands.
- To provide conservation-based fire safety educational information to residents of Lake County.
- To provide a positive balance between fire prevention, conservation, and wildlife protection.
- To coordinate fire protection strategies across property boundaries, including evacuation planning and preparation.
- To encourage the integration of private land management goals with community needs and expectations for fire safety.
- To create ecologically sustainable biomass utilization and removal projects within Lake County.
- To provide a guiding document for future actions of the Lake County Fire Safe Council, land management agencies, private landowners and local emergency service providers.
- To provide a guiding document for government agencies in developing fire safe practices and policies.
- To meet the requirements under the National Fire Plan and other government funding sources and to provide community direction for federal land management within the planning area.

1.2. Organization of This Document

This document is divided into several chapters and appendices for ease of reading.

Executive Summary and Action Plan—a summary of all the documents and the CWPP Action Plan.

Chapter 1, Plan Introduction—an introduction to the document and Lake County.

Chapter 2, Lake County Fire Safe Planning Process—summarizes the public process used to develop this Fire Plan.

Chapter 3, Wildfire: Current Environment and Behavior—introduces wildfire concepts and issues in Lake County.

Chapter 4, Fire Ecology and Management of Lake County Vegetation Types—summarizes the common vegetation types found in Lake County, their fire ecology, and conservation and fuel management considerations.

Chapter 5, Lake County Community Features—describes the social, political, and community-planning milieu; includes a discussion of land ownership and management.

Chapter 6, Fire Protection Organizations—summarizes current fire protection resources and issues in Lake County.

Chapter 7, Risk Assessment: Identifying and Evaluating Assets at Risk—summarizes assets at risk and the community risk assessment process and results.

Chapter 8, Action Plan—identifies actions to reduce risks from wildfire in Lake County.

Chapter 9, Facilitating Lake County Fire Safety in the Long Term—outlines a monitoring strategy and long-term steps to maintain and update this CWPP.

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Appendix A – Community Meeting Notes contains the notes from the community meetings held for the development of this Plan.

Appendix B – Community Meeting Data and Maps contains the maps generated from the community meetings held for the development of this Plan.

Appendix C – Wildland Fire Safety at Home explains conservation-based wildfire safety.

Appendix D – Wildland Fuel Hazard Reduction is a text document explaining conservation-based methodologies and prescriptions that can be used in Lake County.

Appendix E – GIS Data contains a description of maps created and sources used.

Appendix F – Fire Safety Information is a set of Internet links and other background documents.

There is a series of reference information in separate documents. These contain general information that can be used by residents to further fire safety in the county.

The reference documents include:

Reference I – Glossary defines the terms used in this Plan.

Reference II – Internet Links for Further Information provides references for further information on topics discussed throughout this Plan.

Reference III – Literature Cited provides references for literature cited in this Plan.

1.3. Lake County Community Description

Lake County lies in Northern California's Coast Range. It is approximately one hundred miles north of San Francisco, ninety miles northwest of Sacramento, and 35 miles east of the Pacific Ocean.

Originally and to this day the home of the Pomo Indians, Lake County was officially formed on May 2, 1861, from land separated mainly from the former Napa County, with small portions coming from Mendocino and Colusa County. This was ten years following the 1850 admission of California Statehood into the Union and the establishment of the 27 original California Counties. Lake County is now bordered by Mendocino County to the north and west, Yolo, Colusa, and Glenn Counties to the east, and Sonoma and Napa counties to the south.

Clear Lake, the largest natural freshwater lake entirely within California, is the centerpiece of the county. It has a total surface area of 68 square miles (43,000 acres), more than one hundred miles of shoreline, and sits at an elevation of 1,326 ft. above sea level. Most Lake County communities and hence population, are situated around the lake. There are four main watersheds in the county: Upper Cache Creek, Upper Putah Creek, Upper Stoney Creek, and the Upper Mainstem Eel River. Cache Creek, portions of which are recognized as a wild and scenic river, flows in the eastern portion of the county. Putah Creek flows in the southern portion of the county. Stoney Creek flows in the northeastern portion of the county. The Eel River flows out of Lake Pillsbury in the northern portion of the county. Topography within the county is mainly hilly and mountainous with elevations ranging from approximately 640 ft. to 6,873 ft.

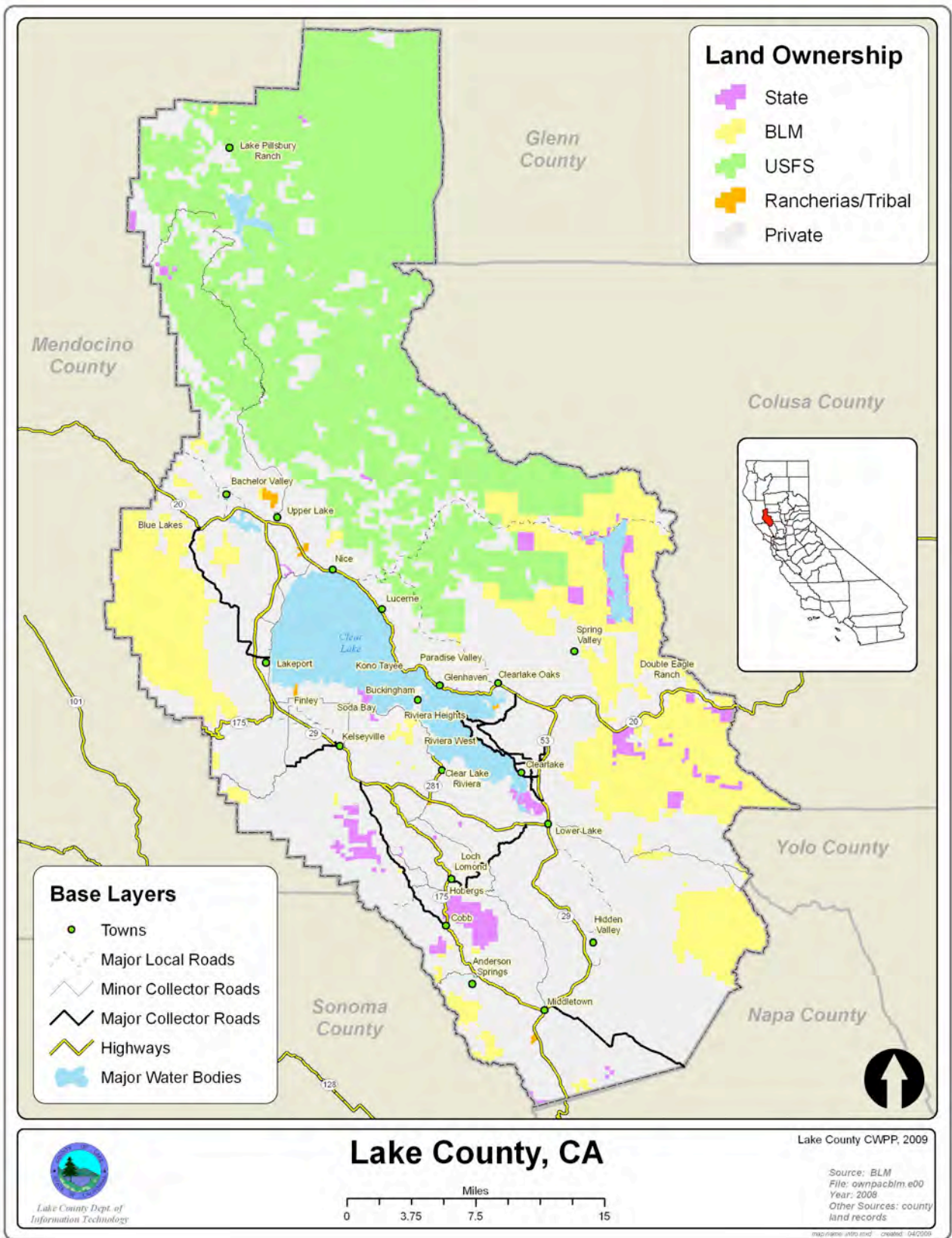
The climate in Lake County is characterized by cold wet winters and hot dry summers. The average annual precipitation ranges from 24 inches in the lower areas to 70+ inches in the mountainous regions. Temperatures range from an average low of 32° F in the winter months to average highs of 95° F in the summer months.

Lake County is known nationally for its excellent air quality. In 2009 it was reported third best in the nation and scored an overall "A" rating from the American Lung Association.¹ It is currently the only Air District in the State of California to meet all ambient air quality standards, both State and Federal.

The total county land base is 1,327 square miles (849,678 acres). Approximately 51% (435,500 acres) of the county is managed publicly by the US Forest Service, US Bureau of Land Management, California Department of Fish and Game, California State Parks, and Lake County. The northern portion of Lake County is mostly the Mendocino National Forest and includes a portion of the Snow Mountain Wilderness area.

¹ American Lung Association. State of the Air Report 2009. p. 24 and p. 54. See www.lungusa2.org/sota/2009/SOTA-2009-Full-Print.pdf for more information.

Map 1-1. Lake County, California



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Figure 1-1. Public Land Managers in Lake County

Agency	Name	Number of Acres
USDA² Forest Service	Mendocino National Forest (this includes a portion of the 37,000-acre Snow Mountain Wilderness)	256,725
USDI³ Bureau of Land Management	Cache Creek Natural Area	27,245
	Cow Mountain Recreation Area	52,000
	Knoxville Recreation Area	Appx. 4,000
	Indian Valley Recreation Area	Appx. 31,000
	Portion of The Geysers	Appx. 2,000
	Black Forest	247
California State Lands	Boggs Mountain Demonstration Forest	3,493
	Anderson Marsh State Historic Park	870
	Clear Lake State Park	300
CA Dept. of Fish and Game	Clear Lake Wildlife Area	97
	Indian Valley Wildlife Area	4,988
	Cache Creek Wildlife Area	2,330
	Loch Lomond Vernal Pool Ecological Reserve	8
	Boggs Lake Ecological Reserve	153
Native American	Robinson Rancheria of Pomo Indians	1,200
	Big Valley Rancheria	240
	Middletown Rancheria	110
	Elem Indian Colony	52
	Scotts Valley Band of Pomo Indians	35
	Lower Lake Rancheria of the Koi Nation	
	Habamatolel Pomo of Upper Lake Rancheria	
Lake County	Alpine Park	1.5
	Austin Park	20
	Highland Park	1
	Hinman Park	1
	Keeling Park	1.5
	Kelseyville Park	3
	Lakeside Park	53
	Library Park	3
	Lower Lake Park	1
	Lucerne Clubhouse	1
	Lucerne Harbor	1
	Middletown Park	1
	Nice Beach	1
	Pioneer Park	1/4
	Rodman Slough	40
	Trailside Nature Preserve	107

² USDA: United States Department of Agriculture

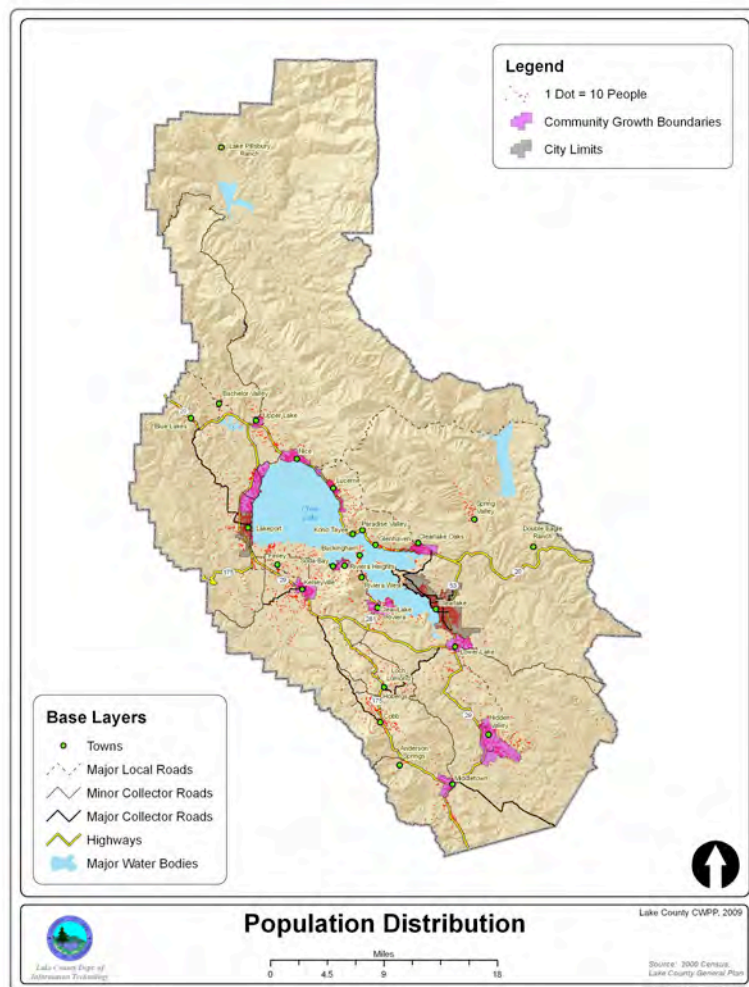
³ USDI: United States Department of Interior

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Agency	Name	Number of Acres
	Upper Lake Park	8
	Helen Mitcham Park	203
	Spring Valley Lake Greenbelt	55
Clearlake	Redbud Park	15
Lakeport	Westshore Pool	1/2
	Westside Community Park	55
Lake County Water Resources	Highland Springs Recreation Area	3,200

According to the 2000 US Census there were 58,309 residents in Lake County. In 2007 it is estimated that 64,664 people called Lake County home.⁴ In 2006 it was estimated that there were 34,516 housing units within the county and that the median income was \$38,113.⁵ See Map 1-2 for the geographical distribution of Lake County residents.

Map 1-2. Lake County Population Distribution



⁴ <http://quickfacts.census.gov>. U.S. Census Bureau. State & County Quickfacts.

⁵ <http://quickfacts.census.gov>

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According to the 2008 Lake County General Plan, Lake County includes two incorporated cities, eleven major unincorporated communities, and six areas of special interest. The two incorporated cities are Lakeport (the county seat), and Clearlake (the largest population center).

The eleven major unincorporated communities are:

- Clearlake Oaks
- Clear Lake Riviera
- Coyote Valley
- Kelseyville
- Lower Lake
- Lucerne
- Middletown
- Nice
- North Lakeport
- Soda Bay
- Upper Lake

The six areas of special interest (according to the 2008 General Plan) are:

- Blue Lakes
- Cobb/Loch Lomond Mountain areas
- Glenhaven
- Guenoc Ranch
- Lake Pillsbury area
- Spring Valley Lake

The major roadways that traverse the county include State Routes 20, 29, 53, and 175. Highway 20, which runs east-west through the county and joins up with Highway 101 (on the west) and Interstate 5 (on the east), is a major transportation corridor through the county. This route gives access to many communities on the northern edge of Clear Lake. Route 29 runs through Napa County to the south and meanders north and west (southern end of Clear Lake) through the county until it reaches Highway 20 in Upper Lake. This route gives access to communities in the southern portion of the county as well as the southern and western shore of Clear Lake. Route 53 runs north-south along the eastern portion of Clear Lake and adjoins Highway 20 in the north and 29 in the south. This route gives access to communities on the eastern end of Clear Lake. Route 175 gives access to communities in the southwestern portion of the county. It runs north and south and meets Highway 29 near 20 at its northern and southern terminuses in the county.

1.4. Lake County Communities at Risk

On January 4, 2001, for the purposes of the National Fire Plan, the Department of Interior (DOI) published in the *Federal Register* a “Notice of Urban-Wildland Interface Communities Within the Vicinity of Federal Lands That Are at High Risk from Wildfire.” In Lake County, Cobb, Clearlake, Hidden Valley Lake, Kelseyville, Lakeport, Lower Lake, Lucerne and Nice were the first communities to be designated as a Community At Risk. On August 17, 2001, the DOI added Anderson Springs, Blue Lakes, Little Valley, Middletown, The Geysers, Upper Lake, and Witter Springs to the list.

After the 2000 fire season, the California Department of Forestry and Fire Protection (CAL FIRE) worked with the California Fire Alliance and developed a list and associated map of communities at risk (*see map data displayed below*) from wildfire. 1990 Census and USGS Geographic Names Information System data on populated zones, as well as CAL FIRE’s Fire and Resource Assessment Program (FRAP) fuel hazard data, were combined to create this map. In addition to the already-mentioned communities, they designated the following as *Wildland-Urban Interface*⁶ Communities at Risk: Clearlake Oaks, Glenhaven, and Loch Lomond.⁷

Most of the populated areas within the county have been designated either at the federal or state level as “Communities Within the Vicinity of Federal Lands That Are at High Risk from Wildfire” (more commonly known as “Communities At Risk”). The Communities At Risk are shown in the following table.

⁶ Wildland-Urban Interface (WUI): The area where wildlands and communities converge, often assumed to be at high risk of wildfire.

⁷ California Fire Alliance. “Communities At Risk History.” cafirealliance.org/communities_at_risk/communities_at_risk_history.

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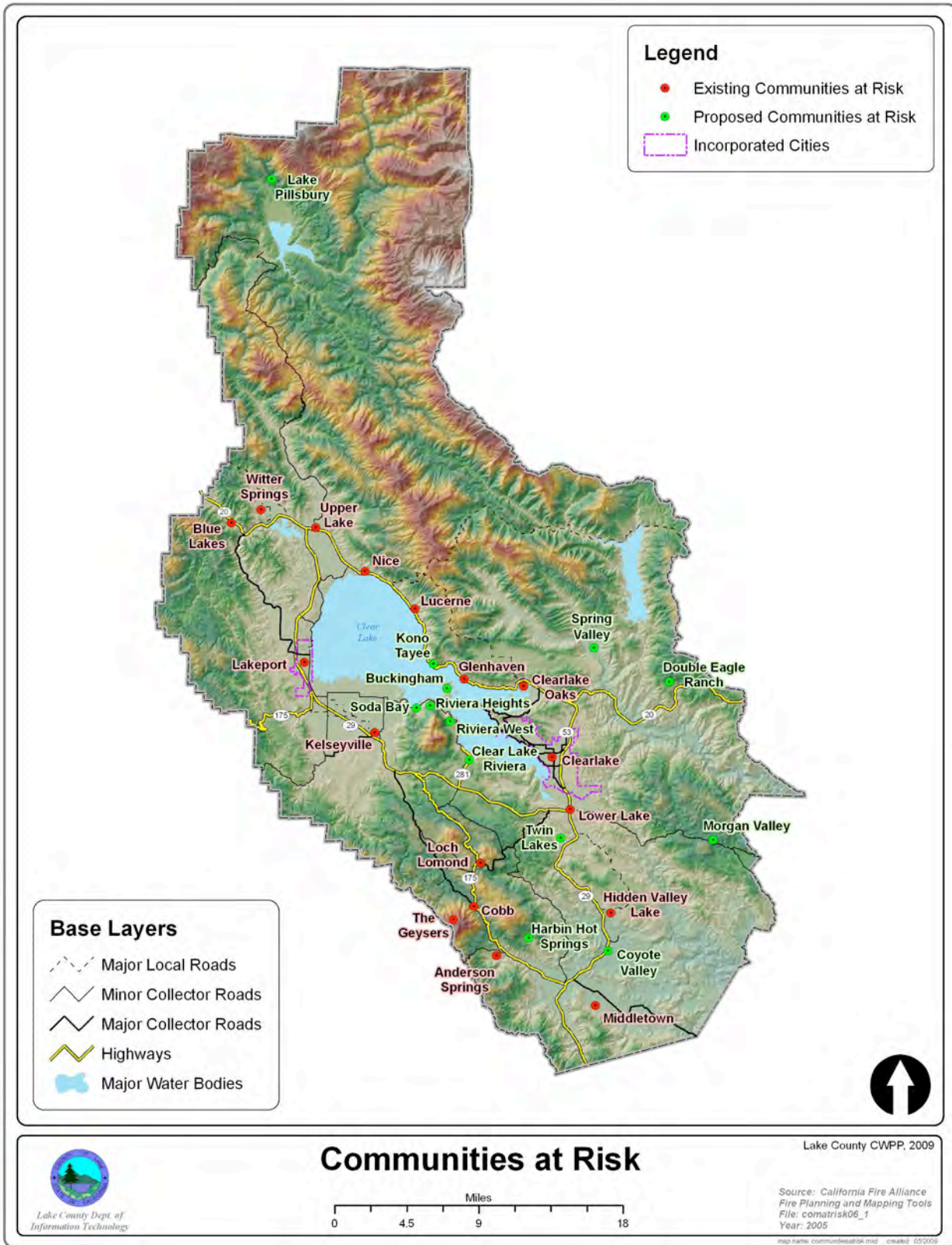
Figure 1-2. Lake County Communities At Risk

Community at Risk	Threat Level ⁸	Federal Adjacency? ⁹	Source of Designation
Anderson Springs	3	F	DOI, <i>Federal Register</i> , 8/17/01 and CDF/CA Fire Alliance, 2001
Blue Lakes	3	F	DOI, <i>Federal Register</i> , 8/17/01 and CDF/CA Fire Alliance, 2001
Cobb	3	F	DOI, <i>Federal Register</i> , 1/4/01 and CDF/CA Fire Alliance, 2001
Clearlake	3	F	DOI, <i>Federal Register</i> , 1/4/01 and CDF/CA Fire Alliance, 2001
Clearlake Oaks	3		CDF/CA Fire Alliance, 2001
Glenhaven	3		CDF/CA Fire Alliance, 2001
Hidden Valley Lake	3	F	DOI, <i>Federal Register</i> , 1/4/01 and CDF/CA Fire Alliance, 2001
Kelseyville	3	F	DOI, <i>Federal Register</i> , 1/4/01 and CDF/CA Fire Alliance, 2001
Loch Lomond	3		CDF/CA Fire Alliance, 2001
Lakeport	2		DOI, <i>Federal Register</i> , 1/4/01 and CDF/CA Fire Alliance, 2001
Lower Lake	3	F	DOI, <i>Federal Register</i> , 1/4/01 and CDF/CA Fire Alliance, 2001
Lucerne	3	F	DOI, <i>Federal Register</i> , 1/4/01 and CDF/CA Fire Alliance, 2001
Middletown	3	F	DOI, <i>Federal Register</i> , 8/17/01 and CDF/CA Fire Alliance, 2001
Nice	3	F	DOI, <i>Federal Register</i> , 1/4/01 and CDF/CA Fire Alliance, 2001
The Geysers	3	F	DOI, <i>Federal Register</i> , 8/17/01 and CDF/CA Fire Alliance, 2001
Upper Lake	2	F	DOI, <i>Federal Register</i> , 8/17/01 and CDF/CA Fire Alliance, 2001
Witter Springs	2	F	DOI, <i>Federal Register</i> , 8/17/01 and CDF/CA Fire Alliance, 2001

⁸ The Threat Level Code designates a community’s fire threat level, with 1 indicating the least threat, 3 indicating the highest threat.

⁹ Lands adjacent to federal lands are indicated as such with a mark in this column.

Map 1-3. Lake County Communities At Risk from Wildfire



1.5. Lake County Fire Protection Areas and Agencies

There are six county Fire Protection Districts, as well as CAL FIRE and the USFS that provide fire-fighting services to Lake County. All of these fire-fighting agencies have the responsibility to provide emergency services within their jurisdictional boundaries. These jurisdictions include Federal Responsibility Areas (FRA), State Responsibility Areas (SRA) and Local Responsibility Areas (LRA). Jurisdictions are based on a variety of factors such as federal ownership, urban areas, and wildland areas. Different fire-fighting agencies will be dispatched to certain areas based on the different jurisdictional boundaries. Jurisdictional boundaries are often crossed in order to provide the best emergency services to all areas within the county.

On FRA lands, federal agencies have primary responsibility for fire protection. Federal agencies (the US Forest Service Mendocino National Forest in Lake County) have responsibility to provide wildland resource fire protection on FRA lands in Lake County. This includes the financial responsibility of preventing and suppressing fires within the forest. Federal lands managed by the Bureau of Land Management (BLM) within the county are contracted to CAL FIRE for fire protection. This is a more efficient way for BLM to provide fire-fighting resources to these lands. BLM does not have fire-fighting resources in Lake County, which makes contracting with CAL FIRE beneficial. However, in the event of a fire on or threatening BLM property, CAL FIRE will consult with BLM managers on suppression tactics.

To more efficiently provide protection over a more contiguous land base, the Federal agencies trade protection areas with CAL FIRE; these lands are balanced within the state. The resulting lands are called State Direct Protection Areas or Federal Direct Protection Areas. The lands that are swapped for the purpose of efficient wildland fire protection in the State of California are reviewed every five years among the signatory parties (USFS, NPS, BLM, and CAL FIRE) to what is known as the Cooperative Fire Protection Agreement or the “4-Party Agreement.”

State Responsibility Area (SRA) lands are defined based on land ownership, population density, and land use. CAL FIRE determines SRA lands per the guidelines established by the State Board of Forestry and Fire Protection. CAL FIRE has a legal responsibility to provide wildland resource fire protection on all SRA lands, including the financial responsibility of preventing and suppressing fires.

Lands in incorporated cities or surrounded by federal land are excluded from SRA lands. For example, CAL FIRE does not have responsibility for densely populated areas or agricultural lands. To more efficiently provide protection over a more contiguous land base, CAL FIRE swaps protection areas with other agencies, with the resulting lands being called CALFIRE Direct Protection Areas.

Local fire districts and urban fire departments are responsible for providing structure protection on SRA lands. They are also responsible for providing all fire protection on Local Responsibility Area (LRA) lands. Therefore, LRA lands are not the responsibility of federal or state agencies. All LRA lands within the county are within the existing boundaries of the local Fire Protection Districts.

Many rural fire departments find it financially beneficial to contract emergency services outside of fire season (generally the rainy season) with CAL FIRE. The purpose is to provide sufficient emergency services during the winter, when CAL FIRE reduces its workforce. These “Amador Plans,” such as the one between CAL FIRE and the South Lake County Fire Protection District, help increase the overall protection for participating districts. CAL FIRE provides emergency personnel to certain stations all year long, under a “Schedule A Contract.”

For a map of current FRA, SRA, and LRA designations as identified by cooperating state and federal agencies, see the Fire Protection Resources Map 6-1 in Chapter 6.

The following fire protection agencies provide fire protection services to residents in the planning area. For more information on these agencies and their services, see Chapter 6.

- Kelseyville Fire Protection District
- Lake County Fire Protection District
- Lake Pillsbury Fire Protection District
- Lakeport Fire Protection District
- Northshore Fire Protection District

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- South Lake County Fire Protection District
- CAL FIRE – Sonoma-Lake-Napa Unit
- US Forest Service – Mendocino National Forest

1.6. Introduction to Lake County Fire Safe Councils

The Lake County Fire Safe Council (LCFSC) was started as an advisory committee to the Lake County Board of Supervisors in 2000. Assisted by a grant obtained by West Lake Resource Conservation District (WLRCD), LCFSC developed an initial countywide Fire Safe Plan, held workshops to provide fire safety education to citizens, provided community chipping days, and partnered in the creation of a fuel break which addressed private property issues in the wildland-urban interface.

A Fire Protection Workshop in March 2009 covered the history of local fires, current hazardous fuel reduction ordinances, community fire-safe preparations, and introductions to local fuel reduction specialists. The intent was to activate citizens to do the necessary fuel reduction work before fire season starts. The Council participated in the development of this Community Wildfire Protection Plan (CWPP), in partnership with the County of Lake and ForEverGreen Forestry. The FSC helped organize the ten community meetings throughout the county to gather citizen input for the document (*see Chapter 2*). The development of Lake County's CWPP has LCFSC members enthusiastic and proactive about fire prevention, with a new respect for the safety of the men and women who strive to help us protect our homes. The County of Lake recently set aside funds to provide a coordinator for the Council to assist with education, organization, planning, project development, grant writing, and project implementation.

The South Lake Fire Safe Council (SLFSC) started in 2001, and is a non-profit organization with an active community volunteer program. SLFSC serves residents and property owners in the 286-square-mile South Lake County Fire Protection District. The group organizes a free-chipping program, is actively working on shaded-fuel breaks in strategic areas of their district, and has an in-school education program. They donate fire safety calendars to the local schools, and a new fire safe tip is discussed each month as part of the students' lesson plan. SLFSC is also contributing to the development of this CWPP.

For more information on the Lake County Fire Safe Council, please contact them at 707-263-4180, ext 16. To contact the South Lake Fire Safe Council, please call 707-987-2857.

1.7. Fire Safety Objectives

Community and firefighter health and safety—along with conservation and protection of Lake County's natural resources—were the issues that led to the development of this Plan. The following objectives are addressed in this CWPP.

Minimize Ignitions

Unplanned ignitions should be minimized. Numerous ignitions place a strain on fire-fighting resources, which can lead to high levels of damage because of greater fire area burned.

Decrease Intensity

One factor that disposes structures to fire damage is fire intensity, or the amount of heat transferred to the structure. High-intensity fires also are most likely to produce *crown fires*¹⁰ and *torching*.¹¹ Embers created from these crown fires are lofted well ahead of the fire front, creating numerous *spot fires*,¹² and they are often the cause of structures burning. The level of fire intensity greatly influences the damage to natural resources. Every

¹⁰ 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.

¹¹ Torching: A rapid and intense burning of a single or small group of trees/shrubs, causing the upward movement of fire. AKA crown fire initiation or flare-up.

¹² Spot Fire: A smaller fire outside the boundary of the main fire, started by airborne sparks or embers.

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ecosystem is adapted to a range of fire intensities; most of Lake County was historically characterized by low- or medium-intensity fire. Higher-intensity fire causes a greater level of damage, such as erosion, degraded water quality, air pollution, tree mortality, visual blights, and a decline in certain wildlife habitats.

Decrease Damage

Fire is part of the natural ecology of Lake County. In contrast, wildfire damage to structures and human improvements needs to be minimized. Increasing fire safety will help limit smoke pollution from conflagrations, helping to maintain and protect Lake County's excellent air quality.

Increase Permeability

One ideal is to allow fire to return to the landscape to play its natural role, without the associated losses and other negative effects such as excess smoke. 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 "cool" fire burns under its normal regime.

Increase Resiliency

An important objective is to 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, effective collaboration among agencies, etc.) also have greater resiliency against fire and other disasters.

1.8. Conservation Principles for Community Wildfire Protection¹³

This document is based on the following conservation principles. These principles were developed in 2007 by a Steering Committee of California agency, conservation, and scientific fire experts. They were modified here to apply to Lake County. The principles were written to be used as a guide for residents in rural areas.

Most residents choose to live here because of the scenic beauty, clean air, and closeness to nature. What many of us don't realize is that living within these forests and *wildlands*¹⁴ 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 Lake County. It will show you how to achieve a positive balance among *fire prevention*,¹⁵ conservation, and wildlife protection. 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
www.firewise.org/resources/homeowner.htm

Some Basic Concepts to Remember for Living with Wildfire

- ➔ **Fire is a dynamic element of California.** If you live in or near a wildland area, 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

¹³ For more information, see: www.forevergreenforestry.com/SierraConservationCWPP.html. ForEverGreen Forestry. *Conservation Principles for Community Wildfire Protection in California's Sierra Nevada*.

¹⁴ 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.

¹⁵ Fire Prevention: Actions taken by homeowners and community members to lessen wildfires and damage caused by wildfires. Includes education, enforcement, and land management practices.

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completely “fireproof” your property, there are many steps you can take to survive inevitable wildfire. For more information see: www.fire.ca.gov/communications/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*,¹⁶ fire department, *Cooperative Extension Agent*,¹⁷ *Registered Professional Forester*,¹⁸ and/or contractors to design the appropriate *fire-safe practices*¹⁹ and *defensible space*²⁰ for your 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.**²¹ It is located in the midst of a much larger landscape. Think about where your property is on the *slope*.²² 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*,”²³ 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*²⁴ 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.
- ➔ **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*²⁵ 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*²⁶) act as a *wick*²⁷ to move fire horizontally across the land. Shrubs, small trees, and

¹⁶ 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.

¹⁷ 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: www.ucanr.org/.

¹⁸ 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/professional_foresters_registration/about_registration/.

¹⁹ 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.

²⁰ 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.

²¹ 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.

²² Slope: A percentage or degree change in elevation over a defined distance that measures the steepness of a landscape.

²³ Aspect: The direction that a slope faces—north, south, east, west, etc.

²⁴ 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.

²⁵ Fuel: All burnable materials including but not limited to living or dead vegetation, structures, and chemicals that feed a fire.

²⁶ 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.

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live branches (*ladder fuels*²⁸) can carry fire vertically into the larger trees. Too much of these surface and ladder fuels can cause the *overstory*²⁹ 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.bcwildfire.ca/FightingWildfire/behaviour.htm.

- ➔ **Timing is everything.** There are appropriate times for different activities on your property, much as there are different seasons of work in your garden. Perform 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*³⁰ 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 the winter and spring; start clearing when the ground begins to dry (when it's not *saturated*³¹) 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. If you need advice about defensible space and fuel reduction planning for your property, contact the Lake County Fire Safe Council. See http://celosangeles.ucdavis.edu/Natural_Resources/Wildland_Fire.htm for more information.
- ➔ **Your house is likely a fuel source.** Many rural 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*³² created by *ember-attack*³³ 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*³⁴ 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 <http://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 <http://groups.ucanr.org/HWMG/index.cfm>. Consult your local fire marshal or see www.firewise.org/resources/files/wildfr2.pdf for more information.

²⁷ 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.

²⁸ 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.

²⁹ 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.

³⁰ Ground-Disturbing Activities: Actions that interrupt the natural condition of the ground, such as digging and compaction from heavy equipment.

³¹ 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.

³² Embers: Small glowing or smoldering pieces of wood or other organic debris, often dispersed ahead of a fire, also known as firebrands.

³³ 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.

³⁴ 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.

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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 www.fire.ca.gov/fire_prevention/fire_prevention_wildland_codes.php 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. *For more information see principle 4c below, and www.livingwithfire.info/beforethefire/accesszone/index.php.*

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 a pleasing landscape.

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 or wildland area. Because you are the conservation steward of your land, your work 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*³⁵ the ecological changes on your property and use that information for *adaptive management*³⁶ of your forest or wildland. To live with wildfire we need to take 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.

To reduce the risk of fire over the long term, we can proactively recreate our surroundings into a more *fire-resilient landscape*.³⁷ In doing this, we need to apply the general concepts of the *precautionary principle*³⁸ while implementing *fuel treatments*³⁹: 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

³⁵ Monitor: To watch, keep track of, or check regularly for changes—in this case, to the environment.

³⁶ 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.

³⁷ 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.

³⁸ 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.

³⁹ 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.

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consideration to ensure that what you leave standing is healthy and *resilient*.⁴⁰ See www.mindfully.org/Precaution/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*,⁴¹ which can be some of the worst offenders in spreading wildfire. Follow vegetation treatments with invasive weed removal. Minimize the 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.

Avoid unnecessarily introducing water into your landscape, as water will generally help non-native plants out-compete native plants. See www.cnps.org/cnps/nativeplants/, www.cal-ipc.org and www.ipm.ucdavis.edu/PMG/weeds_common.html for more information.

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*⁴² 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*,⁴³ 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.eri.nau.edu/joomla/content/view/220/200/lang,en/ 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*⁴⁴ 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*.⁴⁵ If you

⁴⁰ Resilient, Resiliency: The ability of an ecosystem to return to its balanced state after a disturbance.

⁴¹ 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, Arundo, tamarisk, and Scotch broom

⁴² Duff: A layer on the forest floor that is made up of decomposing organic matter such as leaves, needles, and small branches.

⁴³ 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.

⁴⁴ Untreated: Not altered from a natural or original state; unprocessed, e.g. no fuel reduction or defensible space activities.

⁴⁵ 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.

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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 http://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*⁴⁶ used by wildlife. Act especially carefully and leave cover around streams, *seeps*,⁴⁷ 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 poisons and *sediment*⁴⁸ away from any water that could drain into them. Consider using organic or non-toxic materials for fertilizer and weed/pest control. *For more information, see www.dnr.state.mi.us/publications/pdfs/huntingwildlifehabitat/Landowners_Guide/Habitat_Mgmt/Backyard/Backyard_Intro.htm.*

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. *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 *snags*⁴⁹—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. *See www.nwf.org/backyard/snags.cfm for more information.*

e. Conserve rare and endangered species.

One of the bonuses—and responsibilities—of living in a rural area 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. In Lake County, these agencies can be contacted by calling 530-934-3316 (USFS) or 707-263-6838 (Cooperative Extension). 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. *For more information, see http://www.dfg.ca.gov/wildlife/nongame/t_e_spp/ and <http://www.fs.fed.us/r5/projects/ecoregions/m261b.htm>.*

⁴⁶ 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.

⁴⁷ Seep: An area where water rises from an underground source to the surface and creates a wet area.

⁴⁸ 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.

⁴⁹ 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.

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, Natural Resource Conservation Services representative, or local gardeners to find out what *soil types*⁵⁰ are on your property. Some soil types can tolerate much more *disturbance*⁵¹ than others. Minimize activities that could *compact*,⁵² 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. See www.managingwholes.com/new-topsoil.htm for more information.

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*⁵³ (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 www.laspilatas.com/classes/fire_burn_times.html for more information.

c. Minimize erosion.

Protect your soil by keeping it covered. Cover helps to prevent *erosion*,⁵⁴ 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*⁵⁵ areas and *riparian*⁵⁶ 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 www.uri.edu/ce/healthylandscapes/tips/6.html and www.pfmt.org/fire/topos_effect.htm for more information, or Lake County Community Development Erosion Control Guidelines at www.co.lake.ca.us/Assets/WaterResources/docs/Erosion+control.pdf.

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

⁵⁰ Soil Type: Refers to the different combinations of soil particles and soil composition. Soil can vary greatly within short distances.

⁵¹ Disturbance: Various activities that disrupt the normal state of the soil such as digging, erosion, compaction by heavy equipment, etc.

⁵² 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.

⁵³ 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.

⁵⁴ Erosion: The removal of soil over time by weather, wind and/or water such as rain or water runoff from roads.

⁵⁵ Unstable: Land that is lacking stability, or liable to change with activity, such as in the case of steep slopes or crumbly soils.

⁵⁶ 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.

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www.ext.colostate.edu/PUBS/NATRES/06308.html and www.cnr.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. Get involved in your local Fire Safe Council (FSC). 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, www.fire.ca.gov/communications/downloads/fact_sheets/Evacuation.pdf, and 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; this will achieve better ecological outcomes on the ground. Happy, respected people do the best work. See ewp.uoregon.edu/programs.html for more information.

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*⁵⁷ 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.

This CWPP follows these Conservation Principles in an attempt to balance fire safety with other considerations in Lake County.

⁵⁷ Access Roads: Roads that allow entrance into and out of a property.