Sierra County Community Wildfire Protection Plan Update

Final

December, 2014

Table of Contents

Tables

Figures

Blank Page

Sierra County Update Community Wildfire Protection Plan Mutual Agreement Page

The Community Wildfire Protection Plan (CWPP) was developed for Sierra County Fire Protection District #1:

- This CWPP was collaboratively developed. Interested parties, Fire Districts, CAL FIRE and federal land management agencies managing land in the vicinity of the plan have been consulted.
- This plan identifies and prioritizes areas for hazardous fuel reduction treatments and recommends the types and methods of treatment that will help protect the communities.

The following entities mutually agree with the contents of this Community Wildfire Protection Plan:

_____

Signed for: Date:
Sierra County Fire Protection District #1

_____

Signed for: Date:
Loyalton Fire Department

_____

Signed for: Date:
Sierra City Fire Protection District

_____

Signed for: Date:
Downieville Fire Protection District

_____

Signed for: Date:
Allegany Volunteer Fire Department

_____

Signed for: Date:
Pike Volunteer Fire Department

_____

Signed for: Date:

Nevada Yuba Placer Unit, California Department of Forestry and Fire Protection

_____

Signed For: Date:

Tahoe National Forest, U. S. Forest Service, USDA

_____

Signed For: Date:

Toiyabe-Humboldt National Forest, U. S. Forest Service, USDA

_____

Signed For: Date:

Sierra County Fire Safe and Watershed Council

_____

Signed For: Date:

Sierra County Board of Supervisors

Prepared By:
Services provided

WildlandRx, Inc. Geographic Information
by Deer Creek Resources

Executive Summary

CWPP Objective

The purpose of this document is to provide a comprehensive, scientifically based assessment of the wildfire hazards and risks and provide potential projects to mitigate those hazards within the Sierra County Fire Protection Districts responsibility areas, including the following:

- Sierra County Fire Protection District #1
- Loyalton Fire Department
- Sierra City Fire Protection District
- Downieville Fire Protection District
- Pliocene Ridge Community Service District
    - Allegany Volunteer Fire Department
    - Pike City Volunteer Fire Department

See Figure 1

Sierra County Communities at Risk

Community	Federal list
Pike	✓
Alleghany	✓
Randolph	✓
Bassets	✓
Goodyears Bar	✓
Forest	✓
Cal-Ida	✓
Loyalton	✓
Downieville	✓
Sattley - Calpine	✓
Sierraville	✓
Sierra City	✓

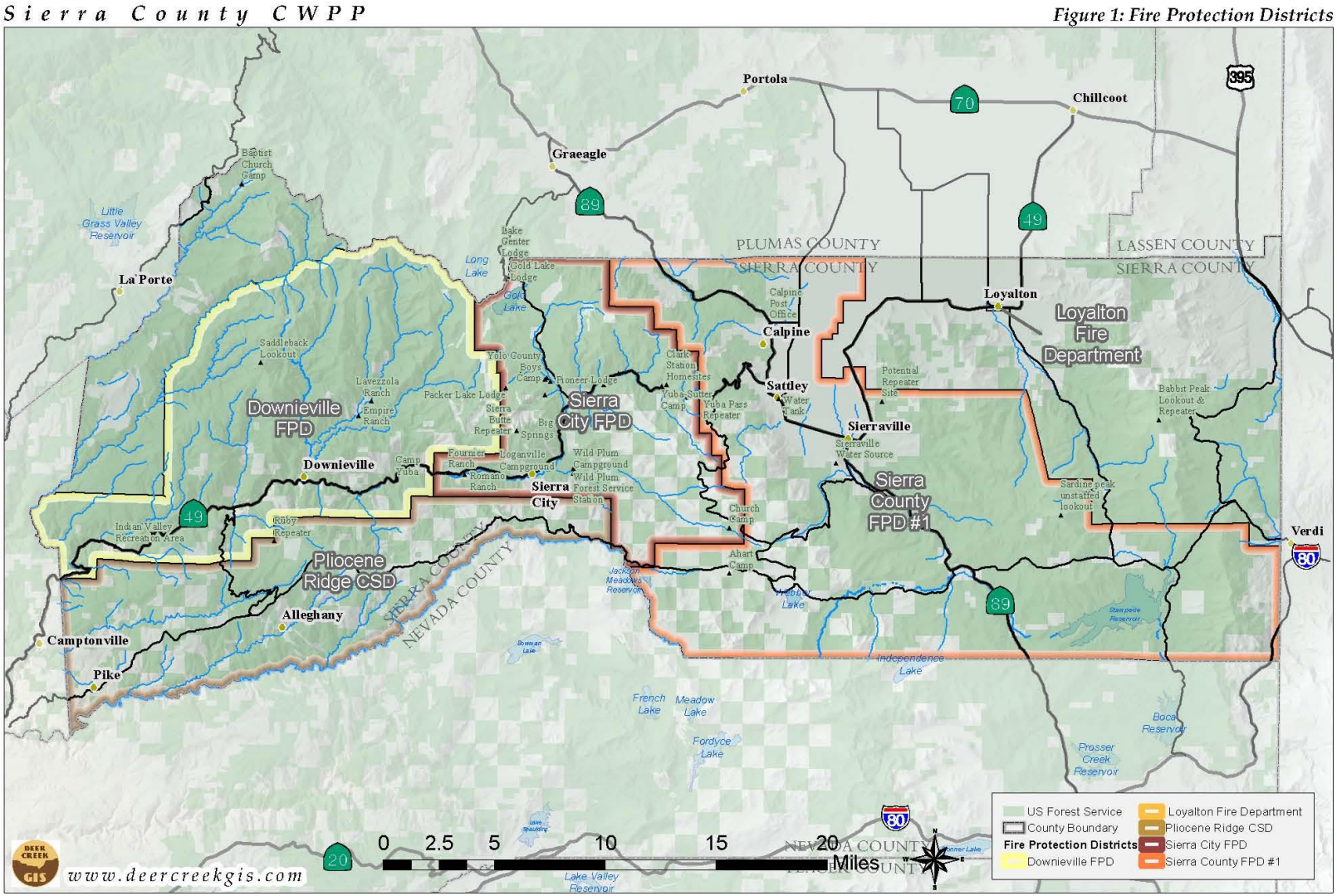
This document is intended to provide and update the Sierra County Fire Plan of 2002. The 2002 Fire Plan has community projects and issues that still need to be reviewed by the fire districts and the fire safe council to determine if the recommendations are still applicable. The Sierra

County Fire Plan can be found in its entirety in the attachments. This document is not intended to replace the 2002 Fire Plan but to update its content and to update the project list.

The content of this document is intended to aid stakeholders in developing short-term and long-term strategies for:

- Hazardous fuel treatment projects and priorities for those projects
- Community wildfire safety education opportunities
- Assist public agencies in making valid and timely decisions for wildfires and evacuations.
- This assessment estimates the hazards associated with wildland fire in proximity to communities. The hazard information, in conjunction with values-at-risk information, defines "areas of concern" for the community and allows prioritization of mitigation efforts.
- Provide communities with opportunities to make a difference in wildfire losses with little cost to the taxpayers and the communities themselves.

Figure 1: Fire Protection District map



I. Requirements of a Community Wildfire Protection Plan (CWPP)

Federal

The CWPP is required to be consistent with and tiered to the following documents, federal acts, and policies. The two acts most associated with fuels reduction policy *The 2010 Federal Land Assistance Management and Enhancement (FLAME) Act* (the most recent congressional act a summary is located at http://www.wflccenter.org/news_pdf/344_pdf) (U. S. House of Represetnatives and Senate, 2009), and ***The Healthy Forest Restoration Act (HFRA) of 2003. The federal agencies' policies that implement the acts are the 10 Year Implementation Plan for HFRA and the Cohesive Strategy.*** These are a national collaborative effort between wildland fire organizations, land managers, and policy making officials representing federal, state and local governments, tribal interests, and non-governmental organizations that will address the nation's wildfire problems**.**

The FLAME Act effort has spawned collaborative consideration and examination of wide-ranging but pertinent elements in creating a synergistic move forward. This report presents those elements in two parts.

- Part one addresses the specific elements requested by Congress in the FLAME Act.
- Part two expands upon those elements and goes further in providing a roadmap for the future—Cohesive Wildland Fire Management Strategy. As a living document, part two provides a foundation from which to build local and regional actions and direction.

Together, this document and the 2002 Fire Plan, address the elements requested by Congress and represent the next stage in an evolving world of wildland fire management; all with the goal of achieving even safer, more efficient, cost-effective, achievable public and resource protection, and more resilient landscapes.

Fire-Adapted Communities

Despite the challenges of assessing and countering risks, progress is being made to address the threats. One approach is the concept of "fire-adapted communities," one of the three primary elements of the *Cohesive Strategy*.

A fire-adapted community is one consisting of informed and prepared citizens collaboratively taking action to safely co-exist with wildland fire. An inherent part of becoming a fire-adapted community is to assess the community and the threat posed to it by wildland fire. A fire-adapted community generally has achieved or is working toward the following:

- Implementing "Firewise" principles to safeguard homes and "Ready, Set, Go!" principles to prepare for fire and evacuation
- Developing adequate local fire suppression capacity to meet community protection needs•
- Designing, constructing, retrofitting and maintaining structures and landscaping in a manner that is resistant to ignition
- Adopting and enforcing local codes that require fire-resistant home design and building materials
- Raising the awareness of and creating incentives for growth planning and management that reduces, rather than increases, fire-prone development
- Properly spacing, sequencing and maintaining fuel treatments across the landscape
- Developing and implementing a CWPP or equivalent
- Establishing interagency mutual aid agreements

http://www.fireadapted.org/ is a website that is a result of the Cohesive Strategy.

The Healthy Forest Restoration Act (HFRA) (U.S. Congress, 2003) Requirements for a CWPP include:

The HFRA identifies CWPPs, which allow communities[1] to:

- Fuel-reduction projects identified in approved CWPPs receive priority for funding requests from the California State Clearinghouse (HFRA sec 103 [d1]). Federal agencies shall consider recommendations identified in CWPPs (HFRA sec. 103[b]) and implement those projects on federal lands (HFRA sec. 102[a]).

[1] Communities are defined as at-risk communities or a group of homes and other structures with basic infrastructure and services (utilities, transportation) within or adjacent to federal lands (HFRA sec. 101 [1]).

State of California

This analysis is consistent and supported by the findings in the ***2010 Forest and Range Assessment of California***. (California Department of Forestry and Fire Protection, Fire and Resource Assessment Program, 2010)

California's Forests and Rangelands: 2010 Assessment, California Department of Forestry and Fire Protection, Fire and Resource Assessment Program, June, 2010

Current Status and Trends

- California's long history of wildfire and population growth has led to a set of state laws, regulations and programs that address community wildfire safety. These include state and local planning laws, Fire Hazard Severity Zones and related building standards, defensible space requirements, various fuel reduction programs, the California Fire Plan and CAL FIRE Unit Fire Plans; and the State Hazard Mitigation Plan.

- Community fire protection is also addressed by federal laws and programs such as the Disaster Mitigation Act, National Fire Plan, Healthy Forests Restoration Act, and Firewise Communities Program.

- Local agencies and non-profits play a key role in community fire protection planning. This is accomplished through county fire plans, county general plan safety elements, and through involvement of local fire districts, Fire Safe Councils, and the California Fire Alliance. It also includes local groups such as the Forest Area Safety Taskforce (FAST) and Mountain Area Safety Taskforce (MAST) in San Diego, Riverside, and San Bernardino Counties.

- Community planning is a collaborative effort that typically includes various federal, state and local agencies, CAL FIRE units, Resource Conservation Districts, local fire districts and private organizations.

http://frap.CAL FIRE.ca.gov/assessment2010/pdfs/california_forest_assessment_nov22.pdf

The new statewide fire plan, 2010 Strategic Fire Plan for California, State Board of Forestry and California Department of Forestry and Fire Protection, November 2010, states for its vision:

"…a natural environment that is more resilient and man-made assets which are more resistant to the occurrence and effects of wildland fire through local, state, federal and private partnerships." (California State Board of Forestry and Fire Protection, November 2010)

The California Fire Plan is the state's road map for reducing the risk of wildfire. By placing the emphasis on what needs to be done long before a fire starts, the plan looks to reduce firefighting costs and property losses, increase firefighter safety, and contribute to ecosystem health. The plan was a cooperative effort between the State Board of Forestry and the California Department of Forestry and Fire Protection (CAL FIRE). The basic principles of the fire plan are as follows:

- Involve community members to ensure that fire protection solutions meet individual community needs
- Assess community risk by identifying community assets at risk of wildfire damage. Community assets at risk are public and private resources (natural and manmade) that could be damaged by wildfire
- Develop solutions and implement projects by developing pre-fire management solutions and implement cooperative projects to reduce a community's potential wildfire losses

California Fire Plan

http://CAL FIREdata.fire.ca.gov/pub/fireplan/fpupload/fpppdf668.pdf

Nevada Yuba Placer Ranger Unit, California Department of Forestry and Fire Protection Fire Plan

http://CAL FIREdata.fire.ca.gov/pub/fireplan/fpupload/fpppdf1483.pdf

Community Wildfire Protection Plans (CWPPs) and Local Jurisdiction

On the local level, CWPPs are a product of a collaborative process among local stakeholders to prepare for and deal successfully with a wildland fire emergency. CWPPs provide a specific risk-assessment to a community, identify areas needing specific treatments, and include roles and responsibilities, evacuation routes, resources, and other pertinent information a community needs in times of emergency. CWPPs are comprehensive wildfire planning tools for a community or a county.

CWPP's also include the opportunity to educate homeowners, targets prioritizes and schedule fuels treatments, and builds response capability. Working together to create a CWPP is an important first step in bringing the awareness of shared wildfire risk home to the community.

Local authorities such as fire departments, county planning and zoning departments and other authorities conduct risk assessments that help them determine their local needs for fuel treatments, equipment, personnel, training, mitigation needs, local ordinances or code adoption and enforcement. Local assessments also can identify which mitigation programs are best for a given community, such as NFPA's "Firewise" and the International Association of Fire Chief's (IAFC) "Ready, Set, Go!"

Regulation through codes and ordinances and subsequent enforcement is a major challenge for communities-at-risk since most of those communities are small. Even if they have authority to adopt codes, many communities do not have the resources to enforce them. Sierra County's communities-at-risk are served by volunteer fire departments, if they have fire protection services at all. Many of these departments do not have the resources to take on additional responsibility without additional funding. The paradox is obvious: Often, communities-at-risk that can do the most to make their communities fire-adapted do not have the resources to do so.

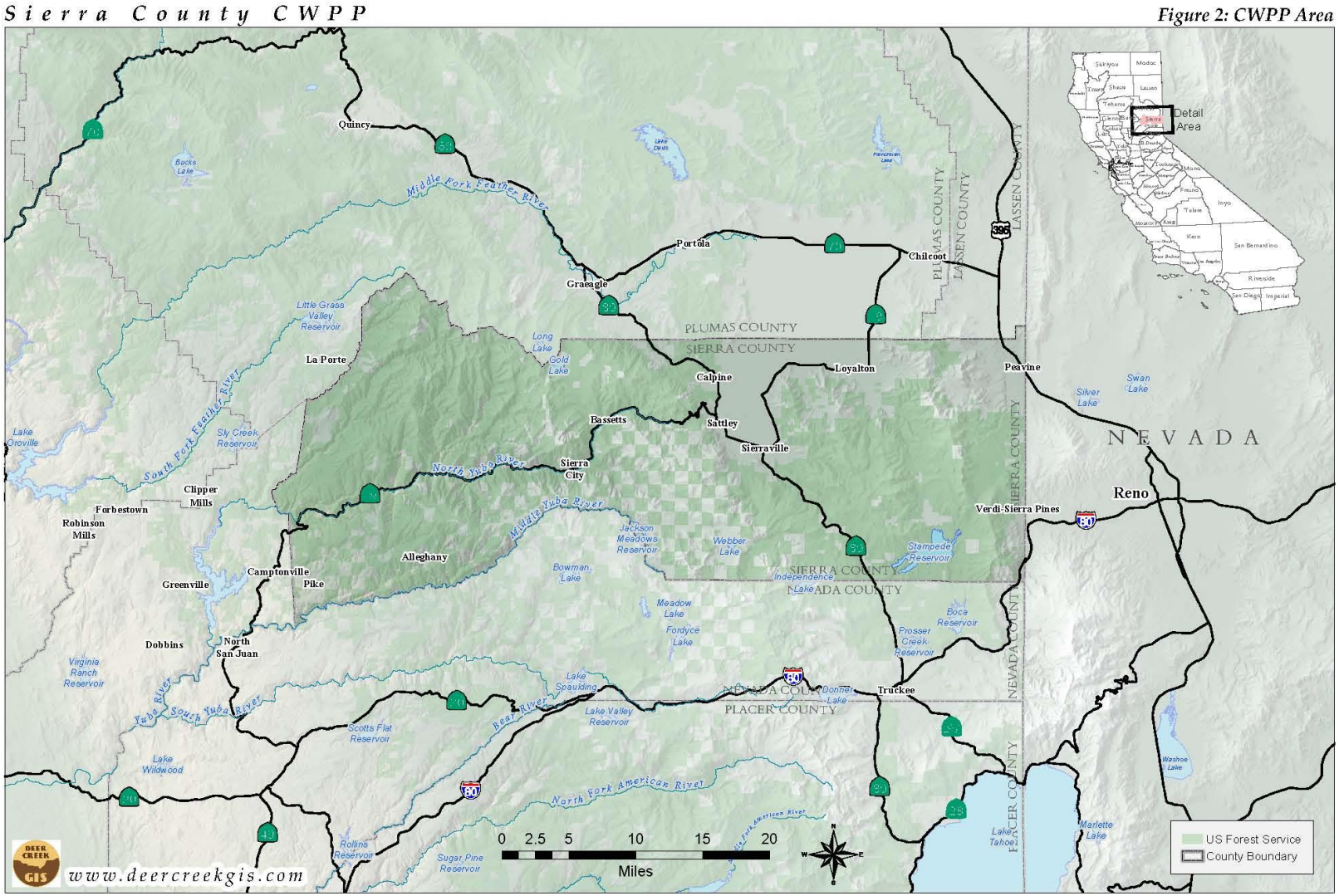
The CWPP is only a plan to help reduce the damage from a wildfire and increase protection for a community. Reducing the threat of a wildfire to a community must be achieved by the local residents of the community this document is intended to guide the community toward the end result of making the community safer from a wildfire. Federal, state, and local agencies may provide assistance, but ultimately, actions that modify fire behavior or increase structural resistance to a wildfire are the responsibility of the local residents. Sierra County communities at risk are unique in some respects since a high percentage of land within the county is owned by the federal government which surrounds the communities. These communities also need to rely on the fuels treatment done by the US Forest Service to modify fire behavior as well. This means that actions taken or not taken by the Forest Service will affect those communities as well. The Tahoe National Forest plays a vital role in providing treatments in the WUI defense and threat zones and because the private property boarders the Forest Service property it is important that the FS works closely with the communities

For more information on CWPPs in California, go to the following websites

http://www.cafirealliance.org/cwpp

http://www.firesafecouncil.org/

Figure 2 Map of CWPP Area, (Base Map)



II. Planning Process

Collaboration

The collaboration process with key stakeholders is an important part of the Plan development and each of the stakeholders have a role in the development process those roles are identified in the section which follows.

Primary Collaborators

Government

- United State Forest Service, Tahoe NF National Forest and Plumas National Forest
- Sierra County Department of Transportation

Non-Government Agency Involvement

- Sierra County Fire Safe and Watershed Council

Fire Department Involvement

- Sierra County Fire Protection District #1
- Loyalton Fire Department
- Sierra City Fire Protection District
- Downieville Fire Protection District
- Allegany Volunteer Fire Department
- Pike Volunteer Fire Department
- CAL FIRE (Limited protection responsibility)
- US Forest Service (direct protection responsibility)

Primary CWPP Development Team members and responsibilities

Sierra County Fire Protection District #1 (SCFPD)

The SCFPD, and its contractor, Wildland Rx will be the lead representatives in the collaborative process and development of the CWPP responsible for the following:

- Serve on the CWPP development team
- Facilitate and coordinate the over-all CWPP process with Local Fire Protection Districts, Federal Agencies, and other key stakeholders.
- Conduct a landscape-scale Hazard, Values, and Risk Assessment for all lands within the designated CWPP area.
- Assist fire departments in providing general discussions and assessments of their departments.
- Provide technical expertise in developing prescriptions for wildfire mitigation treatments.
- Assemble and maintain the final CWPP document.
- Assist in public education efforts for the CWPP

Fire Districts

- Serve on CWPP development team
- Provide input on the assessment process and feedback specific to the fire district for Hazard, Values, and Risk assessments.
- Provide information on past, current, and future mitigation efforts within your district.
- Provide a general description of the fire department and district including its history, size, structure, response statistics, equipment, stations, services, water systems, ignition sources, and any other pertinent information.
- Provide an objective assessment of the department's wildland fire program (including training, prevention, suppression, etc.) identifying its adequacies, future goals, and areas for improvement (training, personnel, equipment, etc.). Assist in recommending areas where grant funding can be utilized.

CAL FIRE

- Serve on CWPP development team.
- Provide oversight of the CWPP process.
- Provide guidance and technical expertise for CWPP development.
- Provide information on past, current, and future mitigation efforts around county.

USDA Forest Service

- Serve on CWPP development team.
- Provide information to past, current, and future mitigation work being conducted on Forest Service properties within or adjacent to the CWPP area.
- Provide a general discussion on Forest Service wildfire program (suppression, mitigation, training, prevention, etc.).

Joint Tasks

All team members should work in concert to accomplish the following tasks:

- Identify appropriate landscape-scale hazard reduction areas throughout the CWPP area.
- Identify WUI boundaries throughout CWPP area.
- Develop an Implementation Plan for this project
- Facilitate and/or participate in community meetings that will allow the public and other stakeholders to provide input and stay informed about this process.
- Outreach and work to create bottom-up interest in WUI communities to develop smaller-scale CWPPs and project-specific implementation plans.
- Assist interested WUI communities in developing smaller scale CWPPs and executing project-specific implementation plans.

-CWPP Planning Process

Planning Area Boundaries

The Planning area boundaries were divided up by the boundaries of the five rural fire protection districts as shown in Figure 1.

Process and Plan Development

Stakeholder meetings

Meetings were held in Sierraville and Downieville and were attended by CAL FIRE, the US Forest Service, Local Volunteer Fire Departments, a county Supervisor, Department of Transportation, and the Director of the county Office of Emergency Services

Community Meetings

Meetings were held in Sierraville and Downieville to discuss concerns and the CWPP process as well to promote input to the CWPP. A questionnaire was distributed to the attendees and the results of the questionnaire can be found in Appendix D

Public Education Effort

Public education is a key component to the successful implementation of any CWPP. The Sierra County Fire Safe and Watershed Council and local Fire Protection Districts along with CAL Fire and the US Forest Service have a responsibility to educate the communities about wildfire safety. This document has information in it that can be used to educate the public about the importance of wildfire hazard reduction, evacuation planning, fire behavior risk and hazard assessment, and applicable laws implemented to reduce wildfire losses.

The Sierra County Fire Safe and Watershed Council has been energized and has begun a reorganization, the Council should involve members from the community and community stakeholders, as well as, the fire protection agencies in Sierra County. Interest in the Fire Safe Council has increased because of the community meetings and the update of the CWPP. The Fire Safe Council has the responsibility to help the public with the implementation of the recommendations in this Community Wildfire Protection Plan. One of the primary purposes of the Fire Safe Council is to educate the public about wildfire safety. It is also the responsibility of the Fire Safe Council to keep the community informed of projects and to prepare grant proposals.

III. Community Description

Weather, Demographics, Topography & the Wildland Urban Interface

Weather

Weather conditions significantly influence the potential for fire ignition, as well as rates of spread, intensity, and direction in which wild fires burn. Wind, temperature, and humidity are the environmental factors that influence wildfire spread and intensity. Wind is considered the most variable and difficult weather element to predict, while wind direction and velocity profoundly affect fire behavior. Wind increases the flammability of fuels by removing moisture through evaporation, by pre-heating fuels in a fire's path, and increasing spotting distances (the distance at which a spot fire might be set by a flying ember). Wind velocities and directions may vary in vertical elevation, with somewhat different impacts on fire behavior. The direction and velocity of surface winds can directly control the direction and rate at which the fire spreads. Winds that blow at least 20 feet above the ground can carry embers and firebrands downwind, causing spot fires to precede the primary front.

Annual highs in the Sierra Nevada are around 90º Fahrenheit, while lows approach 0º F or lower. In the planning area, annual highs are around 90º F, while lows in the winter can approach minus 20º F.

A Mediterranean climate, is typical of much of the Sierra Nevada, with an annual drought from May to October, and precipitation, up until the past 3 years of drought, between 35 and 50 inches from November through April. The precipitation is primarily in the form of rain, with occasional snowfall, especially at the higher elevations. The late summer to fall period is the period of time most subject to wildfires, especially during the occasional low pressure Frontal passages and North and east wind events.

Prevailing winds in fire season (generally June through October) are out of the southwest, although infrequent warm easterly winds usually blow from the north to the east and can occur at anytime a high pressure sets up over the Great Basin but usually occur in the fall months from September through November. More often weather conditions can change rapidly as upper-level wind currents and pressure systems in the western states shift locations, and both dry and wet frontal systems move through the mountainous terrain. Frontal winds associated with low-pressure systems moving across the area can create hazardous fire conditions. Winds in advance of the frontal system can reach speeds exceeding 60 mph over ridges. The atmospheric instability dilutes and disperses smoke, but also creates torching (running crown fires are a result of strong winds) and spot fire problems (distances increase as winds increase).

Fires during North or Northeast wind events (subsidence winds) usually result in extreme fire behavior because the winds are particularly strong and dry, thus preheating fuels and predisposing them to burning with intensity. These conditions are usually worse at night, as these winds combine with downslope/down-canyon winds increase the wind speed.

Demographics

Sierra County is a truly rural County. In 2010, the total population in Sierra County was reported to be 3,240 people (U.S. Census Bureau (2010)), an 8.9% decrease over the previous decade. The population was composed primarily of permanent adult residents with 82% of the population over 18 years of age and a 74% home ownership rate. As of 2009, 2,295 housing units were reported. With a land area of 610,163 acres, the population density averages less than four persons per square mile. Population densities correlate nearly exclusively to the transportation corridors including Highway 49, and 89 and the vast Sierra Valley, which has long been a population and economic center with deep roots in agriculture. Population density also correlates to Local Responsibility Areas (LRA) within the County. State Responsibility Areas (SRA) acres are exclusively interspersed among Federal lands and are Federal Responsibility Areas (FRA). Direct Protection Areas (DPA) with some LRA around Downieville and in the Sierra Valley. Based on current economic forecasts, Sierra County growth projections through 2020 are expected to decrease by up to -1%. The 2010 census data shows an actual population shrink rate of 8.9% for the period 2000 to 2010. Assuming the range of potential growth through 2020, using the current average rate (-8.9 %) and the projected rate (-1%) from State sources, the 2020 population in Sierra County will range from 2,952 to 3,208 people (CAL FIRE Unit Plan).[2]

Vegetation and Fuels

The vegetation found in Sierra County varies from the high mountain mixed conifer forest from the western county boundary to the east side vegetation of the Sierra to high desert on the eastern boundary.

Sierra County is located east of the Sacramento Valley north and east of Sacramento and is bordered by Plumas County to the North, the State of Nevada to the East, Yuba County to the West and Nevada County to the South. Sierra County has a geographic area of 959 square miles (613,120 acres) of which 62 percent is in public ownership (primarily the Tahoe NF, Plumas, and Humbolt/Toiyabe National Forests). Figure 2, Vicinity Map illustrates Sierra County and its communities at risk.

The Sierra Nevada Mountain Range bi-sects the County in a generally north-south direction, which results in two Geographic Areas (the Westside and the Eastside), with distinct differences in weather, vegetation, topography and to some extent demographics and economy. Consequently, these elements will be described separately for the east and west sides of the county with the dividing point approximately near Yuba Pass. These variations in vegetation in Sierra County are caused primarily by elevation, aspect, soil, and weather particularly precipitation.

[2]Unit Strategic Fire Plan Nevada Yuba Placer Unit, update April 2013

Westside

"The lower elevations and some southern aspects are dominated by Mixed Chaparral and Montane Hardwoods (canyon live oak, tanoak, madrone, California black oak, and Oregon white oak with associated conifers that may make up to 1/3 of the stand such as Douglas-fir, ponderosa pine, white fir, and incense cedar).

The mid-elevations (2,500 to 6,500 feet) are dominated with Mixed Conifer (ponderosa pine, Douglas-fir, white fir, incense cedar, and sugar pine with California black oak as a major hardwood associate. Often the understory includes brush species found in the Montane Chaparral (whitethorn, snowbrush ceonothus, greenleaf manzanita, other associated manzanita spices, and bittercherry).

Mid-elevation Mixed Conifer may be heavier to a single species such as Douglas fir at the lower elevations and in draws, ponderosa pine on ridges or where established in plantations, and white fir/incense cedar where selective logging removed the other species and allowed the shade tolerant residuals to get established.

Above 6,500 feet, vegetation starts shifting to more red fir and Jeffrey pine with montane chaparral species mixed in.

Riparian areas by Montane Riparian species such as bigleaf maple, willow, dogwood, and boxelder at the lower elevations and black cottonwood, quaking aspen, alder, and willow are located at the higher elevations.

Eastside

The higher elevations (above 7,000 feet) are heavy with red fir as at the higher elevations on the west side. Some stands have relatively low levels of brush species, but throughout the zone at least some of the Montane Chaparral species are present.

Between 6,000 and 7,000 feet it is more of a Mixed Conifer with the red fir giving way to white fir, Jeffrey and ponderosa pine, and some incense cedar. Montane Chaparral species occur and a few hardwoods.

Between 5,000 and 6,000 feet, the primary vegetation is eastside ponderosa pine with a primarily sagebrush/grass/litter understory.

Below 5,000 feet, the vegetation is primarily sagebrush with grass and some scattered junipers.

Riparian areas for the most part reflect the higher elevation Montane Riparian species such as cottonwood, quaking aspen, alder, and willow."[3]

Wildland Urban Interface

"…the Wildland-Urban Interface (WUI) is the area where houses meet or intermingle with undeveloped wildland vegetation" (USDA and USDI 2001)[4]. This definition came from the Federal Registry 66 of 2001. Many changes have occurred to the terminology that surrounds the definition of a WUI area, but the basic definition is unchanged. The WUI today is broken into two distinct areas, the **defense zone** is the area within .5 mile of the urban core and the **threat zone** is the area within 1.25 miles of the defense zone. Figure 3 shows the WUI areas around the communities in Sierra County

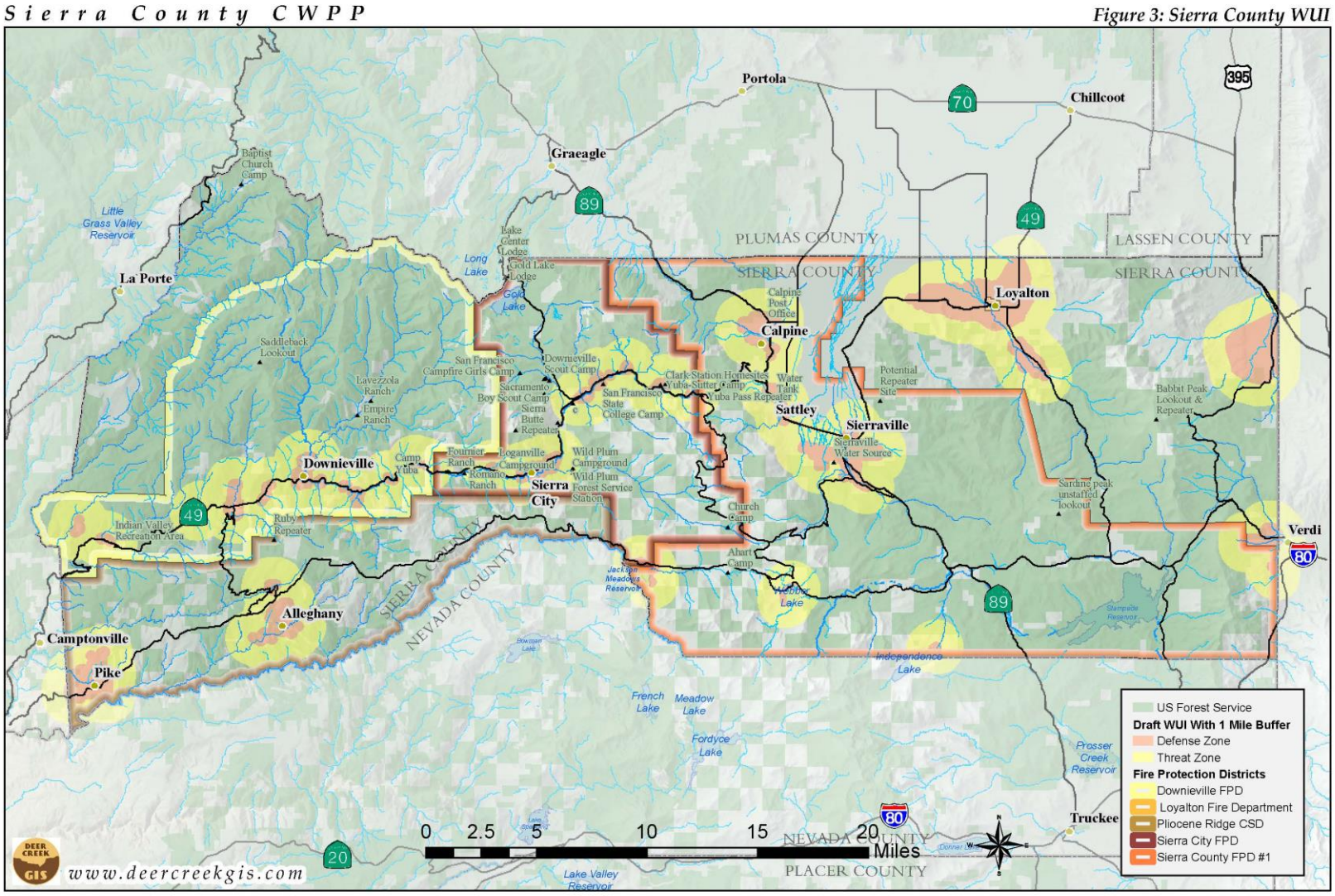
Defense Zone. The defense zone that area surrounding the communities up to .5 miles outside the community is the area that should have priority when it comes to fuels reduction; specifically fuels reduction projects and CPRC 4291 enforcement. The intent of treatment of the fuels in the defense zone is reduce the fire behavior under extreme weather conditions so that suppression resources can adequately engage the fire before it reaches the homes and other important community infrastructure. This means that the fire behavior should be such that the flame lengths are less than 4 feet and the rates of spread are slow enough for ground resources to suppress the fire.

Threat Zone. The Treat zone is an extension of the defense zone is an area with a lower priority for treatments with the exception of those areas where fires are known to start or the fire start could spread rapidly into the community. Evacuation routs within the threat zone are another exception to the treatment priorities, in the case of evacuation routes they are considered part of the defense zone and treated with high priority

[3] Sierra County Fire Safe Council and Community Fire Safe Plan, 2002, David Nelson, Section 2

[4] USDA and USDI. 2001. Urban wildland interface communities within vicinity of Federal lands that are at high risk from wildfire. Federal Register 66:75 1-777.

Figure 3 Sierra County WUI map



Community Emergency Fire Department Services

The fire protection capability of a community is an important consideration when evaluating a community's wildfire risk assessment and description. The following tables contain information about each of the fire protection districts equipment and capabilities. The intent of this documentation along with any fire district needs is to get those needs identified so that the CWPP can be a supporting document for any grant proposals or justification for local fire protection district improvements.

If a fire district table is blank then it is assumed that that fire districts information has not changed since the 2002 Sierra County Fire Plan was written. That information can be found in the 2002 Sierra County Fire Plan as attached.

Sierra County Fire Protection District 1				
Administrative Address:	P.O. Box 255 Sierraville, CA 96126			
Primary Service Area:	Central and Southeastern Sierra County			
Primary Service Population:	1250 persons			
FY2012 Adopted Budget:	$101,321			
Emergency Medical Service:	Four to six EMT's available with two first responder vehicles			
SERVICES PROVIDED:				
Specific Services	**Self**	**Contract**		
1. Dispatch		Sheriff's Office		
2. Fire Suppression	Three Fire houses			
3. Basic Rescue	10 trained			
4. Advanced Rescue	10 trained			
5. Vegetation Mgmt		USFS and SCFS&W Council		
6. Fire Code Permit/Enforcement	CAL FIRE			
7. Haz Mat Response	Provide cordon and traffic control			
8. Construction Plan Check	Battalion Chiefs			
9. Fire Investigation		State Fire Marshall		
10. Community Info/Education	Fire District			

Fire Stations:	**List of Equipment**	**No.**	**Location**	
Sattley Fire Department	E-48 Type 1 Pumper Brush 9—Light Rescue Water Tender-5 4000 gal. capacity	1 1 1	Sattley Fire house	
Calpine Fire Department	E-29 Type 1 Pumper E-24 Type 1 Pumper Squirt/Boom R-23 Light Rescue Water Tender-20 4000 gal capacity	1 1 1 1	Calpine Fire house	
Sierraville Fire Department	E-30 Type 1 Pumper E-21 Type 1 Pumper E-28 Type 3 4WD G-7 Type 3 2WD R-27 Light Rescue R-25 Service vehicle Water Tender-18	1 1 1 1 1 1 1	Sierraville Fire House	
Personnel:	**Number**	**Position**		
Paid Staff:	0			
Reserve-Volunteers:	34			
Support Vehicles				
SERVICE PROFILE:				
Service Calls (CY 2012)*	**Count**		**Average Response Time**	
Structure Fire	**One mutual aid—Loyalton**	**Sierraville Fire Dept.**	**20 minutes**	
Wildland Fire	4	**All stations**	**5 minutes**	
EMS/Rescue	55	**All stations**	**7 minutes**	
Hazardous Conditions	0	**All Stations**		
Service Call	3	**All stations**		
Good Intent	6	**All stations**		
All Others	9	**All stations**		
Totals	78—2013 to October	**All stations**		
ISO Class Rating	6/6x			

Loyalton Volunteer Fire Department (LVFD)				
Administrative Address:	PO Box 128, Loyalton, CA 96118			
Primary Service Area:	City of Loyalton, Sierra Brooks			
Primary Service Population:	Approx. 2000			
FY2013 Adopted Budget:	$28,000			
Emergency Medical Service:	Basic Life Support			
SERVICES PROVIDED:				
Specific Services	**Self**	**Contract**		
1. Dispatch		Sierra County		
2. Fire Suppression	Yes			
3. Basic Rescue	Yes			
4. Advanced Rescue	Yes			
5. Vegetation Mgmt	Yes			
6. Fire Code Permit/Enforcement	LVFD			
7. Haz Mat Response		Regional Truckee		
8. Construction Plan Check	LVFD			
9. Fire Investigation	LVFD			
10. Community Info/ Education	LVFD			
Fire Stations:	**List of Equipment**	**No.**	**Location**	
Station 1 Loyalton				
Station 2 Sierra Brooks				
Personnel:	**Number**	**Position**		
Paid Staff:	0			
Reserve-Volunteers:	20			
Support Vehicles				

SERVICE PROFILE:				
Service Calls (CY 2012)*	**Count**		**Average Response Time**	
Structure Fire	**4**			
Wildland Fire	3			
EMS/Rescue	164			
Hazardous Conditions	0			
Service Call	3			
Good Intent	5			
All Others				
Totals	174			
ISO Class Rating	5			

Verdi Volunteers				
Administrative Address:	155 Bridge St, Reno NV 89523			
Primary Service Area:	Mogul, Caughliin Ranch, Verdi NV and South eastern Sierra County CA			
Primary Service Population:	5000			
FY2012 Adopted Budget:	$12,000			
Emergency Medical Service:	REMSA			
SERVICES PROVIDED:				
Specific Services	**Self**	**Contract**		
1. Dispatch		Truckee Meadow Fire(TMF)		
2. Fire Suppression	Yes	Truckee Meadows Fire		
3. Basic Rescue	Yes			
4. Advanced Rescue	Yes			
5. Vegetation Mgmt.	No	USFS		
6. Fire Code Permit/Enforcement	Yes	TMF		
7. Haz Mat Response	Yes	TMF		
8. Construction Plan Check		TMF		
9. Fire Investigation		TMF		
10. Community Info/ Education Yes				
Fire Stations:	**List of Equipment**	**No.**	**Location**	
Station 351	Type 1	Engine 351		
	Brush	Brush 351		
	Water Tender	Tender351		
	Patrol (Type 6)	Patrol 351		
	Rescue	Rescue 351		
Personnel:	**Number**	**Position**		
Paid Staff:	0			

Reserve-Volunteers:	18	1 Chief, 2 Capt, 15 ffs		
Support Vehicles	0			
SERVICE PROFILE:				
Service Calls (CY 2013)*	**Count**		**Average Response Time**	
Structure Fire	**7**			
Wildland Fire	2			
EMS/Rescue	16			
Hazardous Conditions	1			
Service Call	3			
Good Intent	3			
Vehicle Accidents	13			
Smoke Check	14			
District coverage TMF	41			
Totals	100			
ISO Class Rating	7			

Sierra City Fire District				
Administrative Address:	PO BOX 516, Sierra City, CA 96125			
Primary Service Area:	Sierra City (see figure 1)			
Primary Service Population:	221			
FY2014 Adopted Budget:	$120,266			
Emergency Medical Service:	First response with EMT care by SCFD, Ambulance Service by Downieville Fire			
SERVICES PROVIDED:				
Specific Services	Self	Contract		
1. Dispatch		Downieville Fire		
2. Fire Suppression	Yes			
3. Basic Rescue	Yes			
4. Advanced Rescue	Depends		Mutual Aid	
5. Vegetation Mgmt	No			
6. Fire Code Permit/Enforcement	No		Cal Fire / Truckee	
7. Haz Mat Response	No		Mutual Aid	
8. Construction Plan Check	No		County	
9. Fire Investigation	Minimal		Truckee Fire	
10. Community Info/				
Education				
Sierra City Fire District				
Administrative Address:	PO BOX 516, Sierra City, CA 96125			
Primary Service Area:	Sierra City see boundary map			
Primary Service Population:	221			
Fire Stations:	**List of Equipment**	**No.**	**Location**	
Main	Type II	7962		
	Type II	7966		
	Type II	7971		

	Water Tender	7991		
	Rescue	7931, 7932		
Personnel:	**Number**	**Position**		
Paid Staff:	0			
Reserve-Volunteers:	18	1 Chief, 2 Capt, 15 ffs		
Support Vehicles	Command	7900		
7. Haz Mat Response	No		Mutual Aid	
8. Construction Plan Check	No		County	
9. Fire Investigation	Minimal		Truckee Fire	
10. Community Info/				
Education				
Sierra City Fire District				
Administrative Address:	PO BOX 516, Sierra City, CA 96125			
Primary Service Area:	Sierra City see boundary map			
Primary Service Population:	221			
ISO Class Rating	7/7X			

Downieville Fire Protection District 1				
Administrative Address:	321 Main St, PO Box 25, Downieville, CA			
Primary Service Area:	Downieville Goodyears Bar, and Indian Valey			
Primary Service Population:				
FY2014 Adopted Budget:				
Emergency Medical Service:				
SERVICES PROVIDED:				
Specific Services	**Self**	**Contract**		
1. Dispatch				
2. Fire Suppression				
3. Basic Rescue				
4. Advanced Rescue				
5. Vegetation Mgmt				
6. Fire Code Permit/Enforcement				
7. Haz Mat Response				
8. Construction Plan Check				
9. Fire Investigation				
10. Community Info/ Education				
Fire Stations:	**List of Equipment**	**No.**	**Location**	
Station 1				
Station 2				
Personnel:	**Number**	**Position**		
Paid Staff:	0			
Reserve-Volunteers:	15			
Support Vehicles				
SERVICE PROFILE:				
Service Calls (CY 2013)*	**Count**		**Average Response Time**	

Structure Fire				
Wildland Fire				
EMS/Rescue				
Hazardous Conditions				
Service Call				
Good Intent				
All Others				
Totals				
ISO Class Rating				

Alleghany Fire Department				
Administrative Address:	P. O. Box 920, Alleghany, CA 959			
Primary Service Area:	Eastern half of the Pliocene Ridge CSD			
Primary Service Population:				
FY2012 Adopted Budget:				
Emergency Medical Service:				
SERVICES PROVIDED:				
Specific Services	**Self**	**Contract**		
1. Dispatch		Yes		
2. Fire Suppression	Yes			
3. Basic Rescue	Yes			
4. Advanced Rescue	Mutual Aid			
5. Vegetation Mgmt	N/A	N/A		
6. Fire Code Permit/Enforcement		Sierra County		
7. Haz Mat Response	Mutual Aid			
8. Construction Plan Check		Sierra County		
9. Fire Investigation		CAL FIRE		
10. Community Info/ Education Local district				
Fire Stations:	**List of Equipment**	**No.**	**Location**	
Station 1	Quick Response	7150		
	Structure Truck	7180		
Station 2	Structure Truck	7181	514 Miners St	
	Ambulance			
Personnel:	**Number**	**Position**		
Paid Staff:	0			
Reserve-Volunteers:				
Support Vehicles				
SERVICE PROFILE:				
Service Calls (CY 2012)*	**Count**		**Average Response Time**	

Structure Fire				
Wildland Fire				
EMS/Rescue				
Hazardous Conditions				
Service Call				
Good Intent				
All Others				
Totals				
ISO Class Rating	9			

Pike FPD Concerns:

- All the Trucks are over 30 years old and they have no money to replace them
- PG& E left a large quantity of slash just below town on Foote's Crossing road. Attempts to get them to remove it have been unsuccessful. This is a fire hazard to the community

Pike Fire Department				
Administrative Address:	100 Pike City Road, Pike City, California 95960			
Primary Service Area:	100 Square miles			
Primary Service Population:	200			
FY2013 Adopted Budget:	$12,000			
Emergency Medical Service:	Pike Fire			
SERVICES PROVIDED:				
Specific Services	**Self**	**Contract**		
1. Dispatch		Yes		
2. Fire Suppression	Yes			
3. Basic Rescue	Yes			
4. Advanced Rescue	Mutual Aid			
5. Vegetation Mgmt	Sierra Co/CAL FIRE			
6. Fire Code Permit/Enforcement	Sierra Co			
7. Haz Mat Response	Mutual Aid			
8. Construction Plan Check	Sierra Co			
9. Fire Investigation	CAL FIRE			
10. Community Info/ Fire prevention and Outreach by Pike Fire Education				
Fire Stations:	**List of Equipment**	**No.**	**Location**	
Pike City Fire Station	Command/EMT 2002 Dodge 4x4	6700	Intersection of Pike City Road and Ridge Road	
	Brush/ Type 3 International 1968 350 Gal 4x4	6760		
	Structure Truck, 1990 Westates Ford 700 gal	6780		
	Brush/Medical, 1991 Ford F600, 280 gal tank	6770		

	Pumper, 1971 International, 750 gal	6765		
	Water Tender, 1976 Ford, 3500 gal	6790		
Personnel:	**Number**	**Position**		
Paid Staff:	0			
Reserve-Volunteers:	8			
Support Vehicles				
SERVICE PROFILE:				
Service Calls (CY 2012)*	**Count**		**Average Response Time**	
Structure Fire	**6**			
Wildland Fire	3			
EMS/Rescue	10			
Hazardous Conditions	2			
Service Call				
Good Intent				
All Others	3			
Totals	24			
ISO Class Rating	7			

IV. Community Hazard Assessment

Current Risk
Wildland Fire Behavior

The wildland fire behavior analysis developed for this CWPP was designed to meet two objectives. The first was to examine the existing fire hazard and potential losses in the event of a wildfire, and secondly to use the fire hazard assessment to establish the best treatment locations and priority for those treatments based on expected fire behavior along with input from the firefighting agencies and local community members. The 2010 version of the California Statewide fuels data layer for Sierra County was used in this assessment. This fuels data is the most current inventory of California vegetation that interagency fire experts used to develop the spatial fuels layers for fire planning and decision support in California. The data set was made available from the US Forest Service regional office at McClellan, California. Weather data was used form various Remote Weather Stations (RAWS) weather stations in Sierra County to provide the weather data for the fire behavior modeling. The primary stations used were the Stampede RAWS and the Saddleback RAWS, data from Dog Valley and Rice RAWS stations were also reviewed. There were several models used to assist in the fire behavior modeling FLAMMAP, and FIREFAMILY Plus. The models are described in Appendix A along with the fire behavior maps.

Three important fire behavior outputs are derived from FlamMap and were used in designing the resistance to control maps and tables for the analysis.

> **Flame Length** - used to determine suppression tactics based on how close you can get to the fire
>
> **Rate of Spread** - used to determine fire spread, direction, and to develop triggers points for decisions
>
> **Fire Type** - based on the flame length and availability of ladder fuels, the fire can be a surface, torching, or actively crowning wildfire

The following figure (Figure 3) depicts the modeling inputs and outputs for each 30 by 30 meter cell in the spatial grid (approximate every quarter acre). The surface fuel data and mapping done for this document used spatial input data that was randomly ground verified. This allows decision makers to have the best information possible on potential fire behavior and expected

losses in the CWPP area.

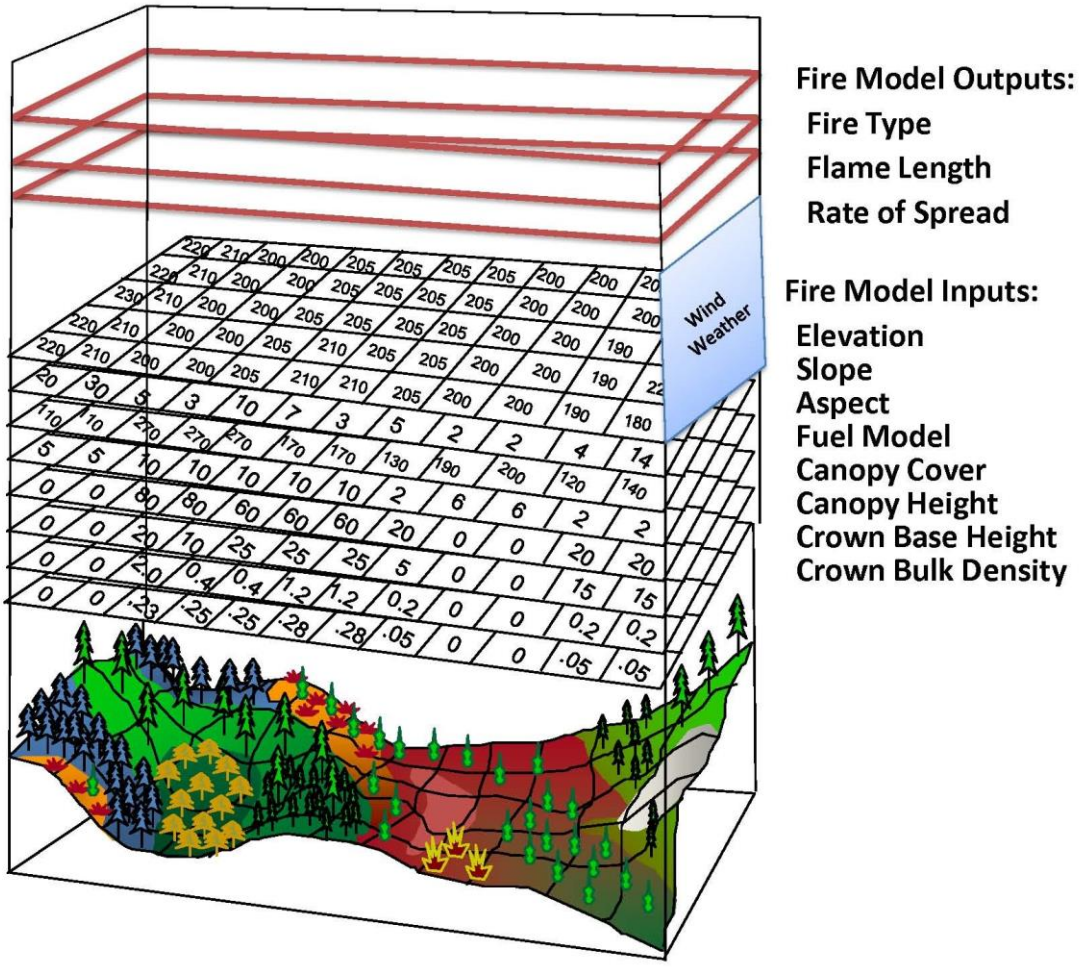


Figure 4 Fire Behavior Modeling

The outputs from the modeling were used to evaluate fire effects, determine the likelihood of potential loss and to determine project priorities. Further refinement was completed after consulting with local fire officials and researching historical fire records. Weather data is required to bring local conditions into the analysis to complete this assessment. Typically the 90th or 95th percentile weather observations (i.e., weather observations that are among the most extreme–only 10% of the observations are more extreme under 90th percentile conditions) are used for fire behavior modeling.

The ERC or Energy Release Component is an output typically used by wildland fire agencies to determine daily fire danger and is explained in the following section

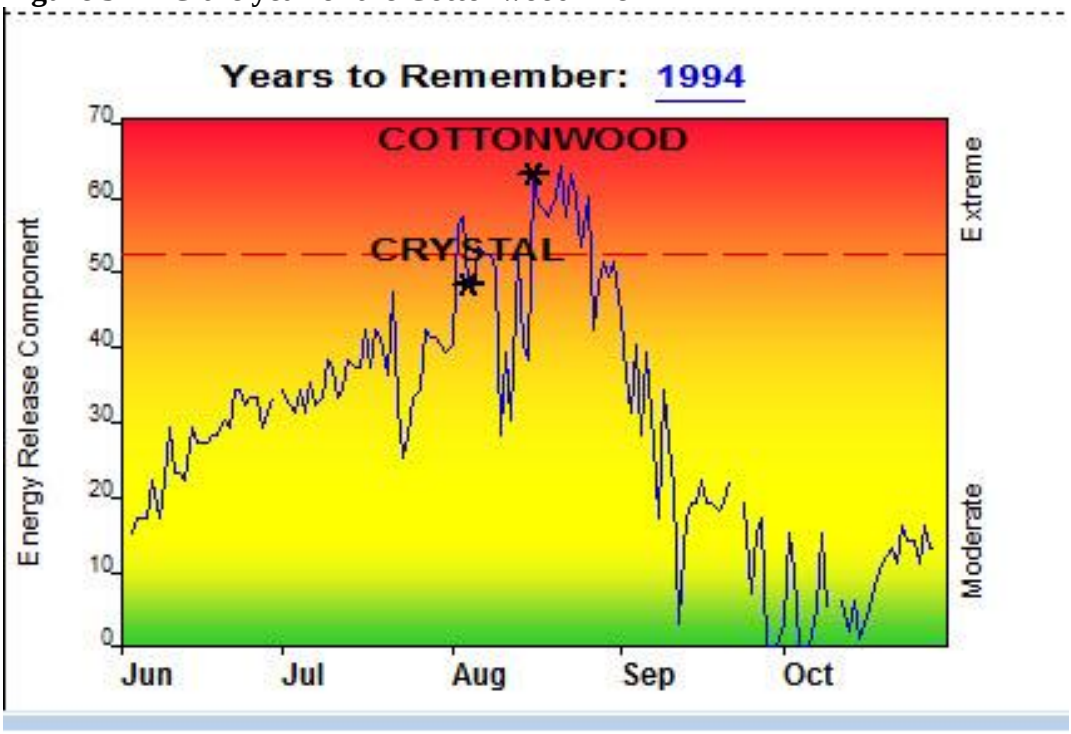
Energy Release Component

When the vegetation burns, it releases energy, this energy can be measured and used to determine fire danger. It is called the Energy Release Component (ERC)

The fire behavior measurement used for this assessment was Energy Release Component (ERC) an NFDRS (National Fire Danger Rating System) index related to how hot a fire could burn. It is directly related to the 24-hour, potential worst case, total available energy (BTUs) per unit area (in square feet) within the flaming front at the head of a fire. The ERC can serve as a good characterization of fire season as it tracks seasonal fire danger trends well. The ERC is a function of the fuel model and the live and dead fuel moistures. Fuel loading, woody fuel moistures, and larger fuel moistures all have an influence on the ERC, while the lighter fuels have less influence and wind speed has none. ERC has low variability and is the best fire danger component for indicating the effects of intermediate to long-term drying on fire behavior (if it is a significant factor) although it is not intended for use as a drought index. (Northern California Predictive Service Center, http://gacc.nifc.gov/oncc/predictive/fuels_fire-danger/psac/erc/index.htm)

The ERC graph (Figure 6) for the Stampede. Station indicates when conditions historically in the CWPP area will support fires that are likely to escape initial attack. Fires which are likely to escape initial attack would occur when the conditions for ERC reaches above 90%. The graph records the average ERC, the maximum historic ERC, the minimum historic ERC, the forecasted, and the actual 20 year ERC for the Stampede Weather station (Figure 6). Figure 5 displays the ERC for two historical fires the Crystal and the Cottonwood Fires. As indicated by the Figures ; the period that a wildfire is most likely to escape initial attack begins around July 15 and lasts well into October on the average year. Recognizing that each year can be slightly different.

Figure 5 ERC the year of the Cottonwood fire



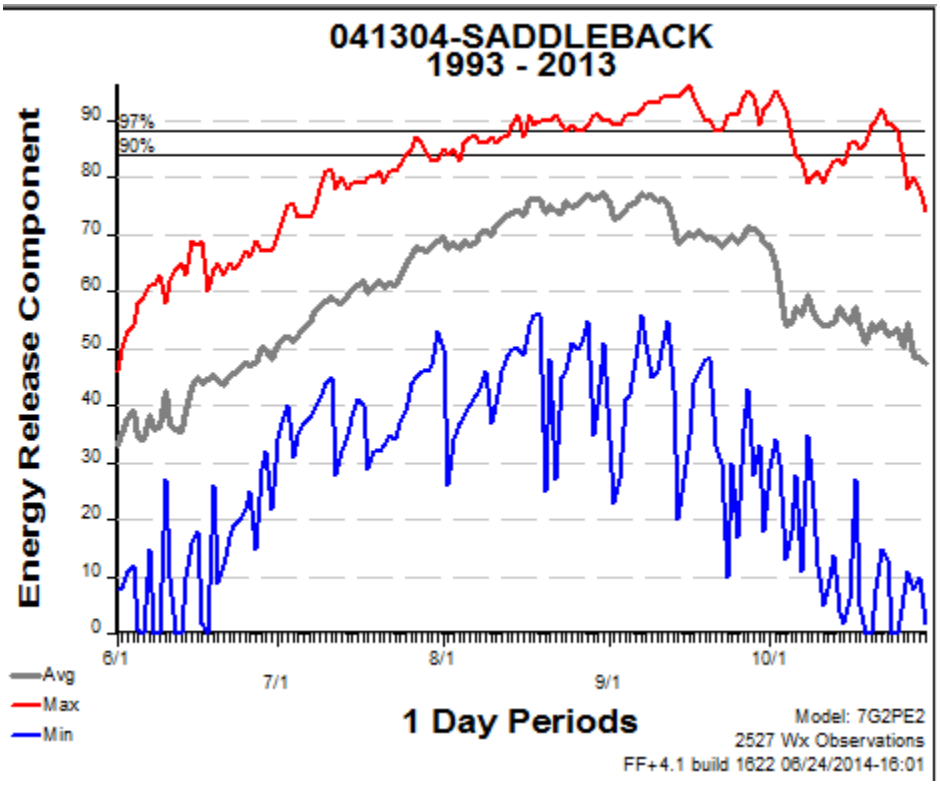


Figure 6: ERC for Saddleback for a 20 year period

As a rule of thumb is when the grass cures the chaparral vegetation and the conifer trees will begin to carry fire. Moisture content continues to drop and the vegetation goes into a dormant state usually in mid-August, at this point wildfires will generally move rapidly through the vegetation living or dead in the CWPP area.

Another important factor in rapid fire spread as previously mentioned is wind direction and speed. To analyze the 2013 hourly wind data from the Stampede RAWS, the Wind Rose Tool was used from the weather station climate data. The wind rose in Figure 6 graphically illustrates 1 year of hourly wind speed and direction collected from the. RAWS. The wind rose clearly shows that most of the time during "fire season" the wind comes from the south-southwest direction across the CWPP area. During the months of September and October, winds often become erratic due to the passage of cold fronts. The winds during those months can also be very dry winds from the east and northeast adding to difficulty in controlling wildfires.

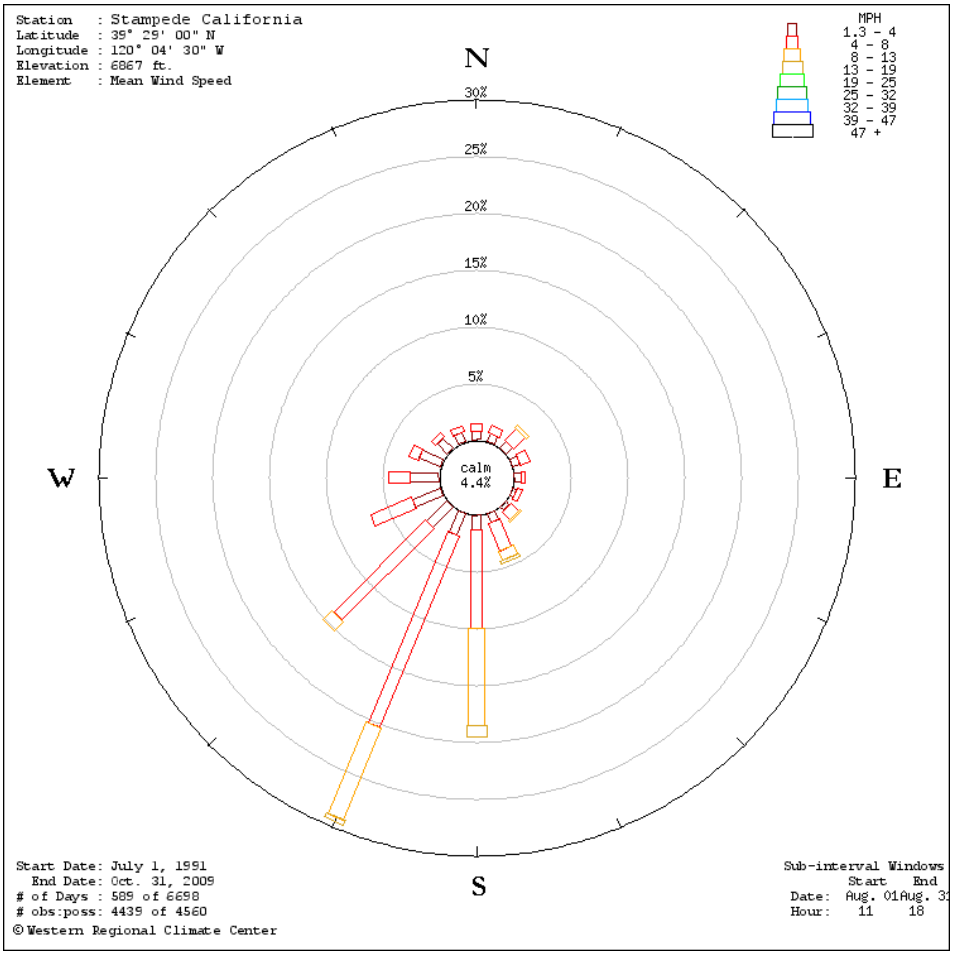


Figure 7: Weather wind rose Typical of the fire season

Wind direction and speed can also be influenced by vegetation type and terrain (slope and aspect) features on the landscape. Figure 7 Weather wind rose shows the average daytime daily (0600-1900) wind speed and direction for the months of July thru October since 1991

Terrain is a landform feature that does not change nor can it be changed. A factor that is constant on the landscape of Sierra County.

Current Risk Situation

The CAL FIRE, 2010 Forest and Range Assessment, chapter 2.1 *Wildfire Threat to Ecosystem Health and Communities*, wrote the definition of key terms for assessing risk. Consistency in understanding these terms and definitions is critical to understanding this analysis. These terms are also important to interpreting the results and rankings, which are used to identify areas that are best suited for projects and to set project priorities. The following are the key terms and their definitions. The 2010 Forest and Range Assessment can be found at the following website. http://frap.fire.ca.gov/assessment2010.html)

> Risk is a measure of the expected damage that a fire may have on assets that hold value to society. In some cases, fire effects may be viewed as beneficial, in which case a negative risk value would be applied. It is important to recognize that a given fire threat will have a varying impact on different assets, and that differing fire threats have different impacts on individual and collective assets. (Chapter 2.1 page 101, 2010 Assessment)
>
> Fire threat is a measure of fire hazard that includes components for the probability (chance of burning) and the nature of the fire (fire behavior). Taken collectively, these two features assess the basic threat features of periodic wildfires and their capacity to drive fire effects. It is important to understand that fire threat carries no direct measure of fire effects and associated value change associated with fire risk. (Chapter 2.1 page 101, 2010 Assessment)

The current risk to property loss from wildland fires has been classified as very high in much of the CWPP area. This has been caused by human intervention or lack of intervention in the accumulation of flammable vegetation in the urban interface. Years of successful initial attack from local suppression resources have created an environment of complex fuels. Some residences continue to be complacent or desire not to change the vegetation surrounding, the community, which has allowed hazardous fuel to accumulate. Other human impacts that add to this problem of homeowner complacency are due to the increase in absentee ownership, and the number of rental properties, in the area. These properties are not likely going to receive any fire hazard mitigation treatments. Historically, in Sierra County, grazing, logging, and other agricultural uses have played a large role in managing fuels and interrupting the continuity of vegetation across the county. In recent years, grazing in much of the forested areas has been significantly reduced.

An analysis of the current fire behavior within the Sierra County CWPP area was done using FlamMap Fire Behavior Model. The weather conditions used in the modeling were derived from

analysis of RAWS data from several weather stations, Stampede, Saddleback, Rice Canyon and Dog Valley. The weather analysis allowed the model to use weather conditions typical of late summer in Sierra County

- Temperature 85-95 degrees
- Humidity 10-15 %
- Eye level wind speed 5-7 mph

The Fire Behavior maps can be found in Appendix A

The other Fire Behavior indicator Flame Length is useful in determining resistance to control Flame lengths greater than 4 feet are very difficult to control. Again using the same parameters for the weather and the FLAMMAP model to determine flame length a fire behavior specialist can develop the areas resistance to control. Flame length and Rate of spread modeling outputs can be found in Appendix B. When evaluating the maps you can see that much of the CWPP area rates out to an analysis score of 50 to 80 giving it a resistance to control in many areas.

Table 1: Resistance to control matrix

Flame Length (feet)	Rate of Spread (Chains / hour)*	Fire Type X 10	Analysis Score	Resistance to Control
0 to 3.9	0 to 4.9	1x10=10	Less than 18.8	Low (1)
3.9 to 7.9	4.9 to 9.9	10	18.9 to 27.8	Moderate (2)
7.9 to 10.9	9.9 to 19.9	2x10=20	27.9 to 50.8	High (3)
10.9 to 19.9	19.9 to 39.9	20	50.9 to 79.8	Very High (4)
20 +	40 +	3x10=30	79.9 and greater	Extreme (5)

*One Chain equals 66 feet 40 chains per hour equals ½ mile per hour rate of spread

Table 2: Effective Fire Suppression efforts

Resistance to Control		Interpretation
Low 1		• Fire can generally be attacked at the head or flanks by persons with hand tools and or engines • Handlines should hold the fire
Moderate 2		• Fire is too intense for direct attack on the head by persons using hand tools • Handlines cannot be relied on to hold the fire • Equipment such as dozers, fire engines, and retardant aircraft can be effective
High 3		• Fire may present serious control problems --torching out, crowning, and spotting • Control efforts at the fire head will probably be ineffective
Very High 4		• Crowning spotting and major fire runs are probable • Control efforts at the head of the fire are ineffective
Extreme 5		

Resistance to Control (Table 2) moderate makes suppression efforts extremely difficult unless there is a break in the vegetation or a change in the weather. Using the above tables and the FLAMMAP runs located in the appendix it is easy to calculate how difficult it will be to control a wildfire under late summer weather conditions. The resistance to control throughout much of Sierra County calculates from high to very high in many of the areas. Large fire history in the county supports this finding. See Figures 8 and 9 .

Figure 8: Large Fire History map (>300 Acres)

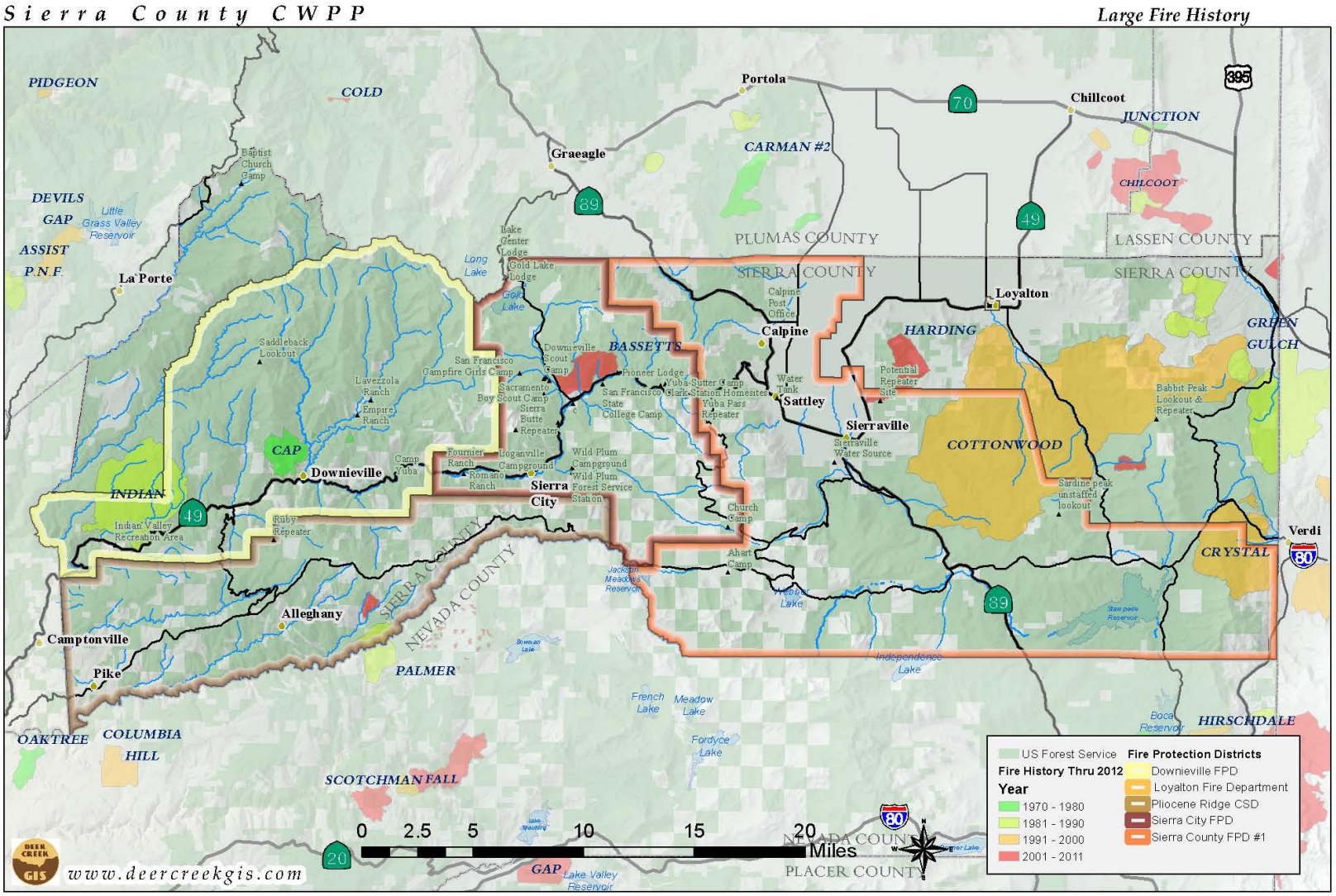
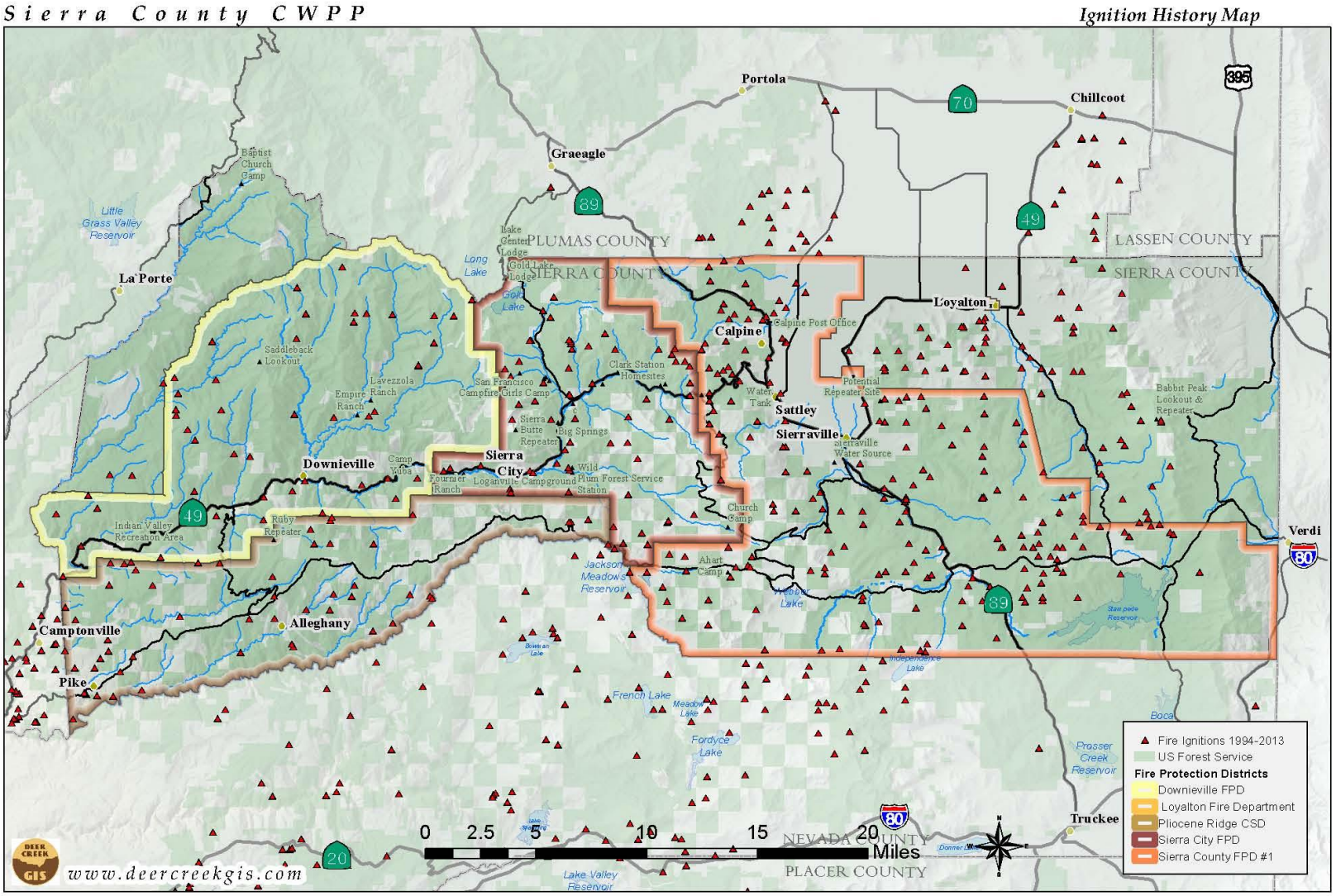


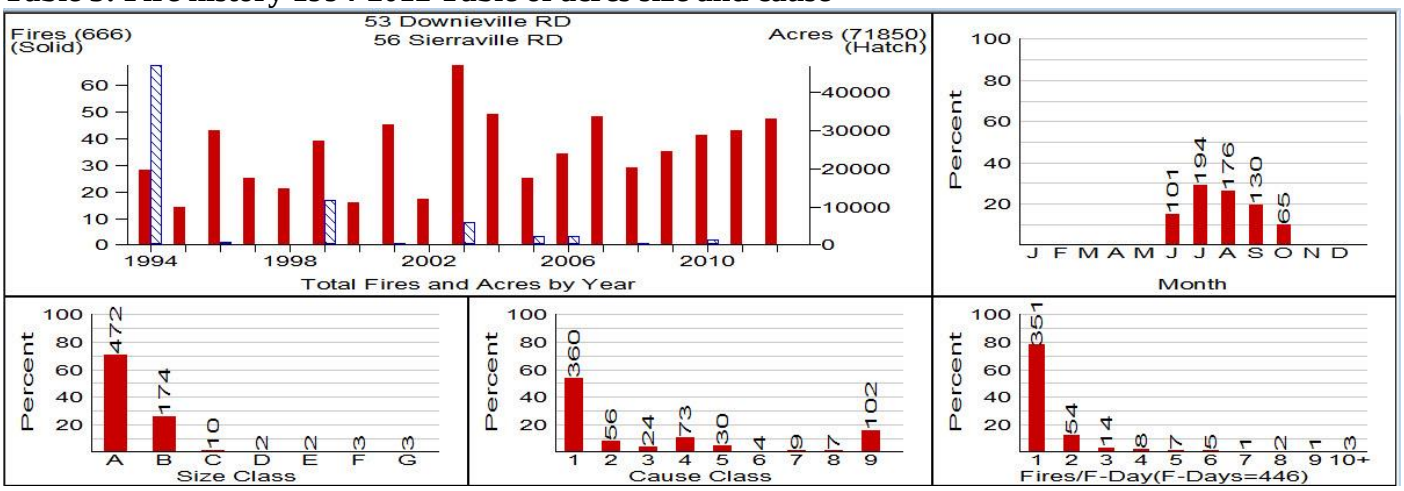
Figure 9: Ignition History map 2005-2010



Fire history plays a major role in assessing the potential for a wildfire to affect a community. The following Table 3 shows the number of fires reported since 1994 and the months of the year, those fires mostly occur as well as the cause. The table also include cause classes: 1 is lightning, 9 is misc., and the causes 2 through 8 are various types of human caused fires. The fire size class is designated by letters and is described in the following:

- A ¼ acre or less,
- B 1/4 acre to 10 acres,
- C 10 acres but less than 100,
- D 100 acres or more but less than 300,
- E 300 acres but less than 1000,
- F 1000 acres or more but less than 5000, and
- G a fire of 5000 acres or more

Table 3: Fire history 1994-2012 Table of acres size and cause



V. Fire Response

Local Wildfire Fire Protection Responsibilities:

The wildfire protection responsibility within Sierra County is somewhat complicated. All private lands in Sierra County, except in part of Sierra Valley (bordered by SR 49 on the south and east, the Plumas County Line on the north, and A23 on the west) and Loyalton (an incorporated city) are classified by the State Board of Forestry as State Responsibility Areas (SRA) in the California Public Resource Code (PRC) 4126. Protection of these lands from wildland fire is the direct responsibility of CAL FIRE. However, through a statewide agreement with the Federal Wildfire agencies (US Forest Service Region 5 and Region4) this land falls under the protection of the Tahoe National Forest, the Plumas National Forest, and the Humboldt Toiyabe National Forests, within their Federal Responsibility Areas (FRA). The closest CAL FIRE station is in Truckee CA.

Table 4: Wildfire and Structure Fire Resources other than Local FPD

Agency	Station	Resource	#	Location
Tahoe NF	Bullards Bar	Crew - Hotshot	20	Westside
Tahoe NF	Camptonville	Engine	5	Westside
Tahoe NF	Downieville	Engine	3	Westside
Tahoe NF	Sierraville	Engine	5	Eastside
Tahoe NF	Lewis Mill	Engine	5	Eastside
Tahoe NF	Hobart Mills	Engine	5	Eastside
Tahoe NF	Hobart Mills	Hand Crew	20	Eastside
Tahoe NF	Truckee	Engine	5	Eastside
Tahoe NF	White Cloud	Helicopter	5	Westside
Plumas NF	Blairsden	Engine	5	Eastside
Plumas NF	Challenge	Engine		
Toiyabe NF	Sparks NV	Engine		
CAL FIRE	Nevada City	Air Tanker – T2 (S-2T)	1,200 gal.	Westside
CAL FIRE	Nevada City	Air Tanker – T2 (S-2T)	1,200 gal.	Westside
CAL FIRE	Dobbins	Engine	3-5	Westside

Agency	Station	Resource	#	Location
CAL FIRE	Dobbins	Engine	3-5	Westside
CAL FIRE	Dobbins	Dozer -	1	Westside
CAL FIRE	Columbia Hill	Engine	3-5	Westside
CAL FIRE	Columbia Hill	Engine	3-5	Westside
CAL FIRE	Truckee	Engine	3-5	Eastside
CAL FIRE	Truckee	Engine	3-5	Eastside

The three National Forests, CAL FIRE, the Nevada Division of Forestry (NDF), and surrounding local fire departments (including those in Sierra County) have other wildland suppression resources in addition to those listed above, including air tankers and helicopters, to respond when requested by any of the three National Forests.

All departments have mutual aid agreements with each other so the local resource pool is large. However, dwindling county budget, more cuts to the fire departments are expected, which will lead to fewer staffed positions. Like all volunteer fire departments, they will continue to have difficulty filling and maintaining volunteers. Much of this is due to an aging work force, the large number of commuters, and the increase in training requirements. Sierra County is a small county, population wise, with many residents living in the county but working outside the area, which makes the pool of volunteers unavailable during the day. This keeps the local fire departments recruiting firefighting positions.

Wildland Urban Interface wildfire suppression condition

Generally, three Wildland fire suppression conditions (wildfire with: structures threatened parcels are generally larger than on acre, wildfire with structure to structure ignition parcels a generally less than one acre, wildfire without structures) exist in the CWPP area, each requiring a specific suppression strategy that is modified as conditions change and the fire moves across the landscape. Table 4 below describes the three conditions, suppression strategy and treatments that can be used to mitigate the pre-fire conditions. The treatment strategies are designed to modify fire behavior so that fire suppression resources have a better chance for success. The treatments are not designed to work alone, that is, fire suppression resources must be present to take full advantage of the treatments during a wildland fire. Notice that compliance with California Public Resource Code (CPRC) 4291 is an important part of the treatment strategy (See appendix C for information on CPRC 4291

Table 4 is simply a potential guide for the fire districts to think about when applying projects or suppression strategies to different areas throughout the County. The table is meant to be a guide when determining what treatments should be done to provide community protection

Table 4 Wildland Urban Interface (WUI) conditions and suppression and treatment strategies

Condition	Suppression strategy	Treatment Strategy
Wildland Fire with structures threatened (*parcels are generally larger than one acre*)	Perimeter control during IA with rapid transition to Asset protection	Design treatments to modify fire behavior for containment prior to reaching individual structures and group structures. (Compliance of CPRC-4291 critical) adjacent to fuel treatments
Wildland Fire with structure to structure ignition taking place (*parcels generally less than one acre)*	Asset protection	Compliance of CPRC-4291 Building Codes Road Access / Turn-a-rounds
Wildland Fire without structures (*very few if any structures or assets at risk from the fire)*	Environmental conditions and resource objectives determine response to unplanned ignitions	Strategically designed treatments to modify landscape fire behavior including strategic perimeter control treatments

VI. Community Preparedness for a wildfire emergency and Action Plan with Recommendations for Projects.

This section covers findings that were made though site visits, meetings with fire district personal, federal agencies, community members and research of current information on Sierra County preparedness for a wildfire emergencies. The first part is Critical Findings and Recommendations and the second part is about potential fire district projects.

1. Critical Findings and Recommendations

The critical findings and recommendations are based on the community meeting inputs, recommendations by State and Federal fire agencies, the Sierra County fire districts/departments, interested community members, and Wildland Rx the CWPP contractor.

Fire Response

Finding: Currently initial attack is successful and extended attack has worked well with all agencies working together to suppress fires quickly. The first engine on scene can be as much as 30 minutes from the time a report of a wildfire is made until they arrive on scene. Currently all the volunteer fire districts in the county are finding themselves with insufficient funding and forced to reduce services and maintain ageing equipment for long periods, across the board. This will lead to reduced capacity and increase in response times to incidents of all types within the county.

Recommendations: The Community needs to be vigilant and realize that suppression resources can be limited, and that it is important to keep informed of resource draw down and participate with the individual fire protection districts in increasing their protection capabilities or prevent their budget cuts.

Finding: Several communities within Sierra County are not in a Fire Protection District. Two of those communities are, Sierra Brooks and the northern portion of Verdi. Sierra Brooks does have a fire station that is operated by the Loyalton Fire Department but it is not formally a member of the Loyalton Fire Department protection district. Verdi California located off Highway 80 in eastern Sierra County also needs to be formally adopted into a Fire Protection District. The older section of Verdi is a part of the Sierra County Fire Protection District #1 with the fire protection contracted to the Verdi, Nevada Volunteer Fire Department. Which adds a level of complexity to their protection.

Recommendation: The Sierra County Fire Protection District #1 has provided a Municipal Service Review (MSR) for annexation of the Verdi area into their Fire Protection District. That MSR is in Appendix F. It is recommended that this MSR be forwarded onto LAFCO for consideration. It is also recommended that a similar MSR be created for Sierra Brooks area and it also be annexed into a Fire Protection District.

Communications and Early Warning in case of a wildfire

Finding

Communications have improved within the Fire Districts but it is the number two priority for the community. There is limited cell phone coverage but still a potential to loose service with a power failure. The use of reverse 911 is available but not all residences have landlines. The questionnaire handed out at the public meetings identified communications as a top issue.

Recommendations: Sierra County participates in a system called Code Red a high-speed system of communication that gives officials the capability to quickly notify community members of emergencies that may affect their area. Code Red is a secure system that community members can enroll in by going on line to the Sierra County website. The Sierra County Public Health Department also has a registration area for individuals that may have health issues that require special treatment such as visually impaired or confined to a wheel chair. These systems only work well if you are at home or are covered by cell phone reception. The Sierra County Resource Guide can be useful for communicating information. The Sierra County Resource Guide is located in the attachments.

Roads and Evacuation Planning

Finding:

- Many of the residents live on limited ingress egress roads, many of the primary and most of the secondary roads in the CWPP area have segments that need to be evaluated for accessibility for suppression resources and evacuation planning. Most large fire engines will have difficulty on these roads.
- More public fatalities can occur during evacuation than from their structure burning down around them.
- The county is severely limited in the number of on duty fire and law enforcement personnel that can be used to begin evacuations in the event of a rapidly moving wildfire

Until recently with the advent of statewide standards for roads in Title 14, the road requirements have been under attack. To add to the standards issues, like many of the roads in Sierra County the streets and roads were constructed years before any standards were even considered and homes were constructed right up to the edge of the narrow roads. Some roads in the county are little changed from the gold rush era of the mid 1800s, particularly the roads in the older communities. Today's private and commercial vehicles and fire equipment are much larger than they were even 30 years ago. Many of the roads in the county that were constructed earlier than 30 years ago were not expected to be conduits for today's population or vehicle sizes. The primary roads in the Sierra County CWPP area shown in Figure 10.

Road Maintenance and Primary Evacuation Road

It is important to coordinate with the County Department of Transportation (DOT), CALTRANS, and local fire districts on setting priorities for roadside clearance to support emergency services as well as evacuation. The result would be that hazard tree and brush removal operations are focused in areas of greatest need based on evacuation planning, road conditions, and numbers of residences served. Road maintenance standards used by the county could be both educational and used as a model by homeowner and road associations.

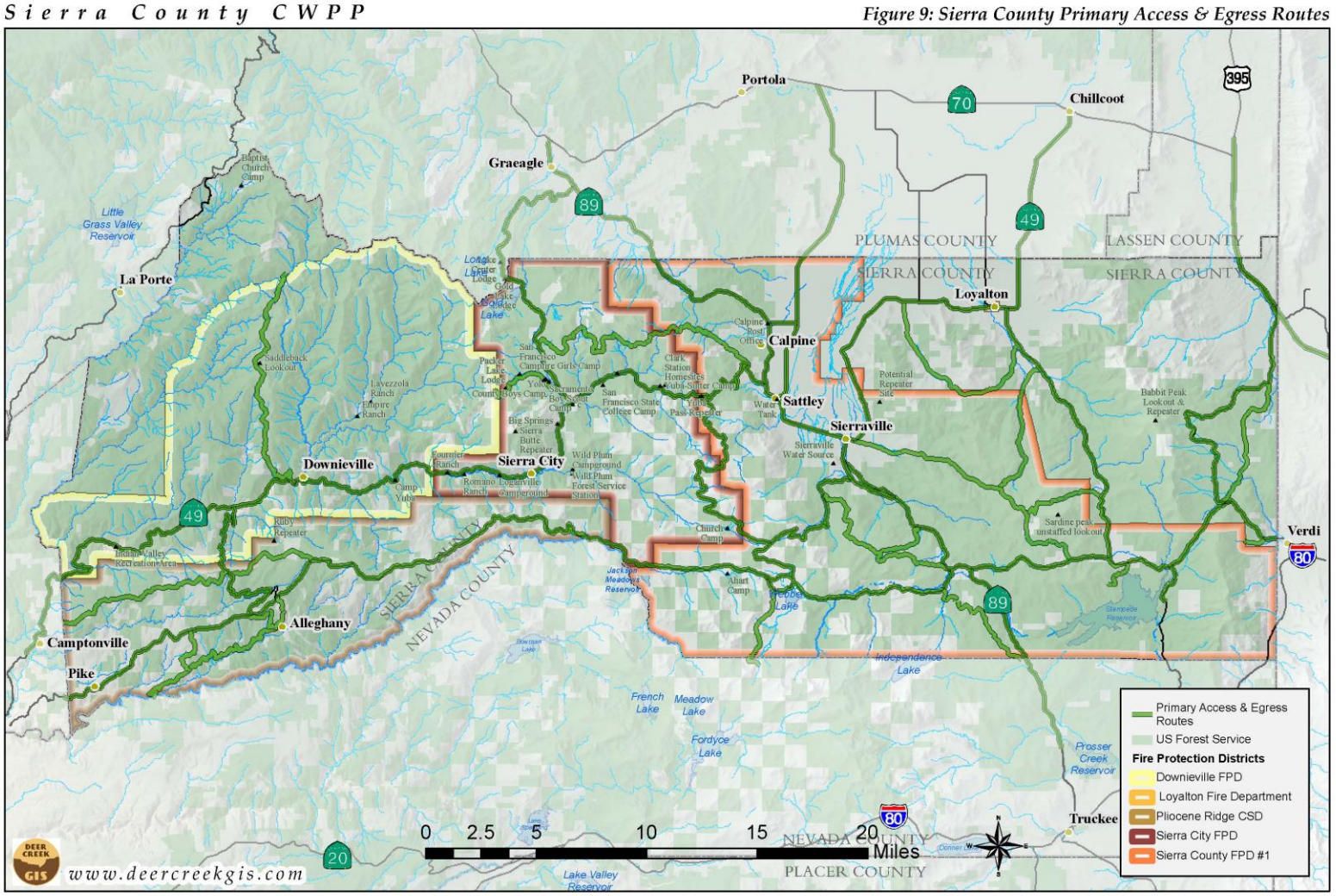
Another weaknesses along the primary evacuation routes are choke points. Choke points are points in roads that feeder roads connect to primary routes and are points that potentially will hinder smooth and rapid evacuation. It is critical to any evacuation that traffic control be set in place as fast as possible at these choke points. Evacuation can be further constrained by the availability of law enforcement personnel. The county is severely limited in the number of on duty personnel and the travel distances that they may need to travel, that can be used to begin evacuations in the event of a rapidly moving wildfire.

Recommendations: Residents need to understand the emergency equipment limitations that pertain to them and the problems there roads cause during suppression and evacuation

Fire District/Departments should inspect all of the roads in their district and make recommendations on whether they are passable for fire equipment and evacuation. County Office of Emergency Services (OES) along with the Fire District establish trigger point for evacuation and actively get community support for evacuation drills. Make sure that the message for evacuation planning is consistent and the plans identified in this CWPP are well distributed to community members.

The idea of keeping and maintaining roads and long driveways open for fire engines is important and recognition of the acceptable standard for roads is the clearance of 15 feet height and 18 feet wide is important to the safety of all. The California Title 14- Natural Resources Division, 1.5- Department of Forestry, Chapter 7- Fire Protection, Subchapter 2 SRA Fire Safe Regulations Articles 1-5, Article 1. Administration, Article 2. Emergency Access, Article 3. Signing and Building Numbering, Article 4. Emergency Water Standards, Article 5. Fuel Modification Standards, sets the current standards for new road construction. Understanding that new road bed standards can't be enforced on old roads. However, vegetation removal, turnouts and turnarounds along these roads should be encouraged by the fire districts.

Figure 10: Primary roads for egress and ingress



Individual understanding of Evacuation Planning

Finding:

There does not seem to be a specific evacuation plan for the communities in Sierra County. The County has a web page with some basic information. Are you Ready is the name of the page. If the county has not developed a plan then perhaps some of the following recommendations would work

Recommendations:

Evacuation Planning
Evacuation Planning is an important component to any CWPP. Educating the public about that importance will strengthen the community's wildfire preparedness. Weekend evacuation exercises should be carried out within communities periodically. Local government (OES, CHP, sheriff offices, fire department, and volunteers) with the help of pre-existing organized groups, set up the exercises. These efforts must be community or neighborhood based exercises and should be pre announced and well organized.

The following is an explanation of why evacuation planning is important and how communities can better prepare themselves for a wildfire evacuation

There are several resources available for making plans and preparing for a wildfire one of the best is located on the internet at http://www.readyforwildfire.org created by CAL FIRE and contains numerous pointers on preparing your home and family for a wildfire, the web page is titled Wildfire is coming ARE YOU READY?

The Firewise and the Fire Adaptive Communities website is an excellent source of preparing the community for a wildfire

http://www.firewise.org

http://www.fireadapted.org/

Another source for all types of disaster planning is the American Red Cross the web address is http://www.redcross.org

Why should communities prepare for a wildfire the following are some examples to illustrate why communities need to be prepared for evacuation. Even though they are examples from large fires in southern California it can happen in Sierra County under the right conditions and a fire starting in the right location.

Faces: The Story of the Victims of Southern California's 2003 Fire Siege, is an important document the describes what happen to twenty tow people who lost their lives during the 2003 wildfires in southern California. It describes what can happen when a community is not prepared for evacuation.

http://www.wildfirelessons.net/documents/Faces.doc

The attitude that evacuation is based on the incident is not acceptable. Preplanning for evacuation is important to the safety of the public. As pointed out in the lessons learned publication *FACES: The Story of the Victims of Southern California's 2003 Fire Siege* even communities such as San Diego County where wildfires requiring evacuations are annual events, they were ill prepared for evacuation and lives were lost. The Faces document is found in Appendix F, Attachments and should be required reading for all emergency personnel both firefighting and law enforcement. More needs to be done to inspire the community members to write their own evacuation plans. The evacuation planning website WILDFIRE IS COMING are you Ready? Is an excellent place to start your preparation http://www.readyforwildfire.org/? It is also highly recommended that the community participate in evacuation drills annually to prepare for evacuation.

When the need arose for evacuation of communities during the Old Fire, those in San Bernardino County who had planned for months in advance for the contingency of evacuation—under the Mountain Area Safety Task Force (MAST) preparations—were able to safely conduct an exodus of mountain residents to safer locations. Those who had not accomplished similar interagency planning in San Diego County became victims of the fast spreading Cedar and Paradise Fires. The residential evacuation process from a wildfire can be one of the most hazardous undertakings, resulting in human injury or death due to chaotic conditions and congestion on the roads. Many of those who died on the Cedar and Paradise fires were trapped by flames while trying to flee to safety.

The development of a multijurisdictional evacuation plan with all partners, informing the public about evacuation procedures in advance and schedule evacuation simulations, such as the communities of San Bernardino County have done, was instrumental in safely evacuating 70,000 people from the mountain resort areas who were threatened by the Old Fire.

Basic Individual Preparation for Evacuation

Evacuate immediately if told to do so. Evacuation instructions will be broadcasted by local authorities the telephone or internet, The use of local radio, and television is difficult in the county because there are non located within the county. You may receive a telephone call by Reverse 911 or if registered with Sierra County's Code Red, an automated system to get emergency information to the public.

To Register with Code Red go to the Sierra County Official website and click on Code Red

When activated, the reverse 911 or Code Red system has the ability to send a pre-recorded message to thousands of telephone customers every minute. If you receive such a call listen carefully to the instructions. Information may include the nature of the emergency, the need to evacuate or shelter in place, shelter locations and how to receive further information. The recorded message will be repeated allowing you to write down any necessary information.

If Evacuation is a Possibility

- Locate your ▪▪*Evacuation Checklist* and place the items in your vehicle.
- Park your vehicle facing outward and carry your car keys with you.▪▪
- Locate your pets and keep them nearby.▪▪
- Prepare farm animals for transport.▪▪
- Place connected garden hoses and buckets full of water around the house.▪▪
- Move propane BBQ appliances away from structures.▪▪
- Cover-up. Wear long pants, long sleeve shirt, heavy shoes/boots, and cap, dry bandanna for face cover, and goggles or glasses. 100% cotton is preferable.
- Leave lights on in the house - door unlocked.▪▪
- Leave windows closed - air conditioning off.▪▪

The Evacuation Process

1. Officials will determine the areas to be evacuated and the routes to use depending upon the fire's location, behavior, winds, terrain, etc.

2. Law enforcement agencies are typically responsible for enforcing an evacuation order. **Follow their directions promptly.**

3. You will be advised of potential evacuations as early as possible. You must take the initiative to stay informed and aware. Listen to your radio/TV for announcements from law enforcement and emergency personnel.

4. You may be directed to temporary assembly areas to await transfer to a safe location.

If You Become Trapped

While in your vehicle:

- Stay calm.▪▪
- Park your vehicle in an area clear of vegetation.▪▪
- Close all vehicle windows and vents.▪▪
- Cover yourself with wool blanket or jacket.▪▪
- Lie on vehicle floor.▪▪
- Use your cell phone to advise officials – Call 911.▪▪

While on foot:

- Stay calm.▪▪
- Go to an area clear of vegetation, a ditch or depression if possible.▪▪
- Lie face down, cover up.▪▪
- Use your cell phone to advise officials - Call 911.▪▪

While in your home:

- Stay calm, keep your family together.▪▪
- Call 911 and inform authorities of your location.▪▪
- Fill sinks and tubs with cold water.▪▪
- Keep doors and windows closed, but unlocked.▪▪
- Stay inside your house.▪▪
- Stay away from outside walls and windows.▪▪

** Note – it will get hot in the house, but it is much hotter, and more dangerous outside.*

After the fire passes, and if it is safe, check the following areas for fire:

- The roof and house exterior.▪▪
- Under decks and inside your attic.▪▪
- Your yard for burning trees, woodpiles, etc.▪▪

Returning Home

Fire officials will determine when it is safe for you to return to your home. This will be done as soon as possible considering safety and accessibility.

When you return home:

- Be alert for downed power lines and other hazards.▪▪
- Check propane tanks, regulators, and lines before turning gas on.▪▪
- Check your residence carefully for hidden embers or smoldering fires.▪▪

To assist Law enforcement and fire personnel in evacuation during emergencies Sierra County has implemented a Community Emergency Response Team (CERT) a program run by OES. The Community Emergency Response Team (CERT) is a training program that prepares people in neighborhoods, the workplace, and schools to take a more active role in emergency management planning. It helps to prepare yourself and others for disaster. These trained personnel, in the event of an evacuation or other emergency can be readily dispatched to assist law enforcement or fire protection personnel.

Water Sources

Findings: There needs to be an effort to continue to add to the water sources in the fire protection districts. The CWPP questionnaire answered by the community at the community meetings identified the importance of adequate storage of firefighting water and locations of tanks, pond and other water sources was identified as one of the top three concerns. It is important to determine current strategy for water storage and evaluate the water capacity of the sources for all areas within the CWPP boundary.

Recommendation: Establish a committee with involvement of the Local Fire Districts and the water districts who can work to evaluate the current water sources and determine any potential improvements. The fire district should continue looking at sources for funding to improve the current water sources in the community. The Structure Protection Preplan (Appendix E) forms can be used to gather this information on water source locations and capacity.

Collaboration, Public Education and Prevention CPRC 4291

Findings: CPRC 4291 limits defensible space development and maintenance to a zone around a building or structure placing the burden of defensible space on the property owner. No such burden, however, is assigned to owners of vacant lots within the communities at risk. Where existing buildings or structures are close to unmaintained lots, defensible space treatments can be effective in protecting that building or structure.

Recommendation: Local Fire Districts, the City of Loyalton, or Sierra County, have the authority to develop ordinance(s) that can place the burden on owner of undeveloped lots within communities at risk to treat accumulated fuels, weeds, rubbish, and stored building materials. To be effective, such ordinances should assign responsibility, prescribe corrective action, allow the responsible party time to accomplish fuels treatment, allow the responsible agency the opportunity to correct situations in non-compliance, and to allow the responsible agency to place liens on the subject property to effect cost recovery.

Findings: There should be focused education on CPRC 4291. The Fire Safe Council or Fire District should perform evaluations for 4291 compliance. As part of the education, the public needs to understand opportunities for assistance to do hazards fuels reduction exists through the County Fire Safe Council and other programs. Since much of the private land is located in the Forest Service DPA it is not fully understood who is responsible for the 4291 inspections and how often they will be performed.

Recommendations: A CPRC 4291 compliance Inspections/education program which provides education to the landowner the role of 4291 in protecting the community, should be carried out by volunteers within the communities, or the local Fire Protection District. This volunteer program can should be offered to the residence, they can deny access. This can be expanded to

include visual inspection without permission and educational material left on the door of the residence. A form used by CAL FIRE (LE 100) is found in the Appendix F, Attachments, along with direction on how to implement the requirements of the law. It is recommended that the community create its own form using the LE 100 as an example for their evaluation form. Follow up with CALFIRE of any properties not compliant is important for enforcement of the CPRC 4291.

2. Fuel Treatment Recommendations Past and Future Projects

Very few maps were found of the recommended treatments from the 2002 Fire Plan. A review of the following projects from the 2002 Fire Plan is recommended to determine if they should be implemented. The review should be accomplished by each individual fire protection districts and if necessary prioritized.

There are several of the terms used in the old document that need clarification. A Chain equals 66 feet and the DFPZ or Defensible Fuel Profile Zone. The term DFPZ is no longer used instead fuel break is the proper terminology. The following projects were taken out of the 2002 Fire Plan and a complete list can be found in the attached Fire Safe Plan

The list of the projects follows the narrative which is Table 5 a summary of the 2002 projects.

Community Project recommendations of the 2002 Fire Safe Plan:[5]

ALLEGHANY

1. ***Downslope (South & East) Fuel Break/DFPZ:*** *Construct a 200-300 foot wide fuel break/DFPZ on the down slope edge across the south end of Alleghany and then north above the North Fork of Kanaka Creek. In general, it is recommended that the fuel break be at least 200 feet along the slope and across the ridges and up to 300 feet where it crosses the draws where fuels get dried out and pre-heated by convection and flames funneling up the draw.*

    - *Begin near the rocky knob on the west near the Footes Xing Road (S191) and below Miners Street in the NW/NW¹ of Section 3, T18N R10E MDM, and traverse the slope easterly (crossing the intermittent draw between the 4200 and 4300 foot contour line and continuing easterly in the vicinity of the 4200 foot contour line taking advantage of the old road system into the SE/SW of Section 34, T19N R10E MDM, and*

    - *Then follow the terrain north along the 4200 foot contour line (again taking advantage of existing roads) into Kanaka Creek, and*

    - *Then north along Kanaka Creek to where it crosses the Kanaka Creek Road (S307).*

[5] Sierra County Fire Safe Council and Community Fire Safe Plan, September 2002

[1] *NW/NW is the short version of the NW ¼ of the NW ¼ and this shortened version will be used throughout this section.*

Consider utilizing the Sixteen to One Mine Road, which runs from Miners Street easterly into and possibly across the North Fork of Kanaka Creek. This road may not be the best location, but there are several other roads that are also possible locations. This area was not checked out as it is gated. There is a possibility this fuel break/DFPZ could tie into existing areas of little or no vegetation as a result of mining activity. The slopes on this fuel break vary from 20-60% and would require a significant amount of handwork to cut and pile for burning or chipping. This route was not walked so specifics as to total fuel loading, road locations, breaks in terrain and vegetative cover that can be taken advantage of, etc. are not known.

This fuel break/DFPZ would be about 80 chains in length (1 mile), approximately 32 acres, and mostly within the Community Core Area as designated in the General Plan with some in the Community Influence Area and entirely within the USFS Urban Core. It will protect the community from a fire moving up into the North Fork of Kanaka Creek and making a run up the west slope into Alleghany. The eastside of the North Fork of Kanaka Creek is primarily oak with light surface fuel loading.

2. ***North and West Fuel Break/DFPZ:*** *Construct a 150-200 foot fuel break/DFPZ;*

   a) North and westerly across the north side of Alleghany from the north end of fuel break #1across Hells Half Acre Road, and

   b) Then southerly on the slope above the structures on Main Street back to 100 Main on Alleghany Road (S180).

      1) *This fuel break/DFPZ would begin where the ridge line intersects Kanaka Creek Road (S307), just west of the bridge, and traverses northwesterly along the this small ridge in the SW/NE of Section 34, to about the 4600 foot contour line, and*

      2) *Then follows the 4600 foot contour south across the Hells Half Acre Road, and continues south in the vicinity of the 4600 contour line above the structures along the slope to the first major draw just west of 100 Main St.*

         a. The 4600-foot contour line crosses a piece of national forest land in the NE/SW, Section 34.
         b. The DFPZ/fuel break will need to drop down the hill from the 4600-foot contour near the draw just west of 100 Main Street.

c. *The lots along this line are very small so most of the individual responsibility is only to the property line (< 50 feet).*

This proposed project is about 80 chains (1 mile) in length and approximately 24 acres, of which most would be within the Community Core Area, some in the Community Influence Area, and all in the USFS Urban Core Area.

The exact location will need to be laid out on the ground to take advantage of the topography and previous clearing where practical. This fuel break/DFPZ also is located on steeper slopes, which will require a significant amount of hand labor.

***Note:** Some areas along both #1 and #2 are very thick and in some cases will tie into other openings and clearing that individuals have already done.*

3. ***South and West Fuel Break/DFPZ:** Continue with a fuel break/DFPZ from the end of #2 above southerly down the draw west of 100 Main to the Footes Crossing Road (S191) and then east along S191 and tie into fuel break/DFPZ #1 in the NW of Section 3. This project would be about 20 chains (1/4 mile) in length and approximately 3 acres. It is located entirely within the General Plan Community Core Area and the USFS Defense Zone.*

4. *Construct a **modified roadside fuel break**:*

a) ***Kanaka Creek Road** from the junction with Main Street east past the houses. This project is about 20 chains (1/4 mile) in length and approximately 3 acres. This project is within the General Plan Community Core Area and the USFS Urban Core Area.*

b) ***Hells Half Acre Road** from the west fuel break/DFPZ to the Henness Pass Road (S309) for safer egress and ingress for both residents and firefighting apparatus. This project is about 80 chains (1 mile) in length and approximately 12 acres. About 10% of it is in the General Plan Community Core Area and all of it is in the USFS Urban Core Area.*

c) ***Ridge Road (S180):** From about 100 Main Street westerly to the junction of S180 (Ridge Road)/ S300 (Mountain House Road/ S309 (Pliocene Ridge Road). This is about 300 chains (2.5 miles) in length and approximately 45 acres of which about 70% is on TNF*

lands. It is outside the General Plan Community and Community Influence Zones and about 50% within the USFS Defense Zone.

5. *Work with the USFS to construct a **fuel break/DFPZ** (1 chain on each side of the road) from the three way junction identified in #5 above **Henness Pass Road (S309)** about 20 chains past the junction of Hells Half Acre Road for safer egress and ingress for both residents and firefighting apparatus. This is about a 160 chain (2-miles) project and approximately 32 acres located outside the CDZ in the general forest zone.*

   The USFS has a contract to masticate brush and small trees along a portion of this area just east of the S180/S300/S309 junction and north of S309 this year. Additional projects (prescribed burning and mastication) on the north side of S309 to the east and west are in the planning stages.

PIKE

1. ***South Fuel Break/DFPZ:** Construct a 300+ foot wide fuel break/DFPZ behind/below the structures located on the south side of Ridge Road (S180) from Barrango Lane (NW/NW of Section 19, T18N R9E MDM) east beyond the Pliocene Ridge School/Bear Court to the unimproved road that goes north from Ridge Road (S180) to Old Schoolhouse Road (S292) in the NE/NE of Section 17.*

   ***Note:** Portions of this fuel break/DFPZ in section 19 and possibly 17 are located on Sierra Pacific Industries (SPI) lands.*

   This project is about 200 chains (2.5 miles) in length and approximately 90 acres. The entire project is within the General Plan Community Core except for a portion of the eastern end. The entire project is within the USFS Urban Core Zone and is the highest priority to protect the community from a potential wildland fire coming up out of the Middle Fork of the Yuba River.

2. ***East Fuel Break/DFPZ:** Construct a 200-300 foot wide fuel break/DFPZ northerly on the eastside of the Pike Community from the downslope (south) fuel break/DFPZ north along an unimproved road (NE/NE of Section 17 and the E/SW of Section 8) to Old Schoolhouse Road (S292). The northern ¾'s of this fuel break/DFPZ would be on Sierra Pacific Industries (SPI) land. It would be about 70 chains long and approximately 27 acres.*

This project is outside of any General Plan Community designations, but within the USFS Urban Core and Defense Zones.

3. ***North Fuel Break/DFPZ:*** *Construct a 200-300 foot wide fuel break/DFPZ westerly across the north side of the Pike Community along Old Schoolhouse Road (S292) to a point about 200-300 feet west of the junction of Pike City Road (S190) and Old Schoolhouse Road (S292). This project would be about 90 chains in length and approximately 34 acres. About 75% of this fuel break/DFPZ would traverse TNF lands of which some has been underburned.*

   An alternative location to the Old Schoolhouse Road (S292) would be to go westerly from the eastside fuel break/DFPZ along the section line common to sections 8 and 17 to the Glory Hole Road and follow this road north to Old Schoolhouse Road (S292) in the vicinity of the PG&E substation. Distance and acreages are similar.

   It is difficult to tell from the General Plan maps, but it appears that at least portions of this project are within the Community Influence Zone. It is within the USFS Urban Core and Defense Zones.

   Note: *Some areas along these routes (#1 through #4) are very thick and in some cases can be tied into other openings and clearing that individuals have already done, including the USFS underburn in section 8. The USFS underburn area will require some additional work to provide protection to the community.*

4. ***West Fuel Break/DFPZ:*** *Construct a 200-300 foot wide fuel break/DFPZ from the westerly terminus of the north fuel break/DFPZ (#3 above) south and westerly down the western side of the Pike Community going around the developments in the Quail Hill Lane, Apple Court, and Lohman Ranch Road areas. This project is about 130 chains in length and approximately 49 acres and is entirely within the USFS urban core area. The southern 1/3 is within the General Plan Community Core Area.*

   Note: *Wayman Ranch and the large meadow above Our House are located within this proposal which will reduce the number of acres that need treatment.*

5. ***Modified Roadside Fuel Breaks:*** *Construct modified roadside fuel breaks along:*

   a) Ridge Road (north side) - 160 chains
   b) Glory Hole Road - 50 chains

c) *Nugget Alley* - *15 chains*
d) *Pike City Cutoff* - *25 chains*
e) *Poplar Lane* - *25 chains*

6. *The area east of Glory Hole/Nugget Alley and west of the east fuel break/DFPZ may be a candidate for an area wide fuel reduction (SPLAT) project. This area is about 200-250 acres. It would not be necessary to reduce the fuels in this area as drastically as in the clearance around homes and in fuel break/DFPZs.*

7. *Ensure 200 feet of defensible space around the entire Pliocene Ridge School to enhance for use as a Safety Zone.*

GOODYEARS BAR

All ingress/egress routes have fairly good clearance except portions of Pebble Street and Woodruff Creek Road; however, ensure that all ingress/egress routes meet the modified roadside fuel break standards for 50 feet on each side of the outer road edge. At least portions of S300 and S400 already meet this standard.

1. *Mountain House Road (S300)* - *20 chains*
2. *Goodyears Creek Road (S400)* - *80 chains*
3. *Pebble Street* - *15 chains*
4. *Woodruff Creek Road* - *10 chains*

DOWNIEVILLE

1. ***East Fuel break/DFPZ:*** *Construct a 150+ feet wide (or at least to the national forest boundary) fuel break/DFPZ east of Main Street above the houses (Bailey Ranch Road and River Streets) from Belle Street north beyond Johnson Way. National Forest lands are very close along this route. This project is about 35 chains in length and approximately 7 acres and within the Community Core Area and the USFS urban core.*

2. ***West Fuel break/DFPZ:*** *Construct a 150-200 feet wide fuel break/DFPZ on the westside of Downieville from SR 49 north to the west of Church Street and Ponta Ranch Road. This project is about ¼ mile in length and approximately 6 acres within the Community Core Area and the USFS urban core.*

3. *Construct a **modified roadside fuel break along Oxford Mine Road** from the junction with Main Street up to the gate. This project is about 30 chains in length and approximately 4.5 acres, which are all within the Community Core area and the USFS urban core. There is quite a lot of old logging slash and other cuttings dumped along this road by others.*

SIERRA CITY

1. *Biggest need is general clean up within the interior of the community (especially in the Sacred Mound Road area where it is steeper with some brush, small trees, and heavy duff and litter) which will require cooperative community action as a number of lots are less than ½ acre in size. Total area is 10-15 acres.*

2. *Construct a modified **shaded roadside fuel break**:*

   a) ***Butte Alley:** 50 feet on both sides from the Sacred Mound Road to SR 49. This project is about 30 chains in length (approximately 4.5 acres) all within the Community Core Area and the USFS urban core.*

   b) ***Wild Plum Road**: 50-100 feet on both sides from Hwy 49 to the TNF boundary. This project is about 60 chains in length and about 9 acres. It is entirely within the General Plan Community Core Area and the USFS Urban Core Area.*

BASSETTS/GREEN ACRES

1. *At minimum, in addition to adequate defensible space around all structures, construct a **modified shaded roadside fuel break** 50 feet on each side of all roads/streets in Green Acres, and*

2. *Create a **modified shaded roadside fuel break** 100 feet wide above Greene Road at the bottom of Green Acres.*

CALPINE

North Fuel Break/DFPZ*: Construct a 200-300 foot fuel break/DFPZ westerly from where the TNF work ends (just north of the terminus of Farrar Avenue) along the border of private lands and the TNF across the north side of the Calpine Community to the section line common to Sections 17 and 18 to the north and west of the terminus of Catfish Lane.*

This project is about 20 chains in length and approximately 6 acres. It is located within the General Plan Community Core Area and the USFS Urban Core Area.

Note: *The USFS has treated national forest lands along this proposed DFPZ/fuel break to the north in section 17, which may allow a narrower fuel break/DFPZ along these routes.*

2. ***West Fuel Break/DFPZ****: Construct a 200-300 foot fuel break/DFPZ around the Westside of the Calpine Community.*

   a) Beginning at the terminus of the north fuel break/DFPZ,
   b) Go south about 20 chains along the section line common to Sections 17 and 18 (again bordering private land and TNF lands) to the section corner common to Sections 17/18/19/20,
   c) Then west along the section line common to Sections 18 and 19 for about 20 chains to the northeast corner of parcel 107 (Nelson Trustees), and
   d) Then south 20 chains to the southwest corner of lot #92 (Benamati).

   This project is about 60 chains in length and approximately 24 acres and is located within the General Plan Community Core and the USFS Urban Core Areas.

   Note: *The USFS has treated national forest lands along this proposed DFPZ/fuel break to the west of the line common to Sections 17/18, and to the north of the line common to Sections 18/19. This may allow a narrower fuel break/DFPZ along these routes.*

3. ***South Fuel Break/DFPZ****: Construct a 200-300 foot fuel break/DFPZ across the south side of the Calpine Community going easterly from the terminus of the west fuel break/DFPZ (southwest corner of lot #92), tying into Meadow View Road, and continuing east to SR 89.*

   This project is about 80 chains in length and approximately 32 acres.

4. *The Westside of Calpine is a possible candidate for a **SPLAT** (Strategically Placed Land Area Treatment) if it can be coordinated with the Swedes Unit of Copren Forest Resources (parcel #77?). Main Street dead ends into their locked gate). This would provide additional protection to Calpine from the west.*

5. *Ensure that the following streets and roads comply with the **modified roadside fuel break** standards.*

Street/Road	***Length (Chains)***	***Area (Acres)***
West Main Street	*80*	*8*
Meadow View Road	*60*	*6 (north side only)*
County Road	*50 (minimal work)*	*7.5*
Wanda Way	*10*	*1.5*
Meadow Ranch Court	*5*	*0.8*
Catfish Lane	*20*	*3*

SATTLEY

Sattley	Modified Roadside FB	Cemetery Road	1.5	**20.0**	30.0	**3.0**
				.25 miles		

Meet minimum defensible space requirements and ensure that Cemetery Road meets the modified roadside fuel break standards (20 chains/3.0 acres).

SIERRAVILLE

Sierraville	Modified Roadside FB	OldTruckee Road	1.5	**35.0**	52.5	**5.3**
				.44 miles		

Meet minimum defensible space requirements and ensure that Old Truckee Road meets the modified roadside fuel break standards (35 chains/5.3 acres).

LOYALTON

None other than meeting minimum defensible space requirements.

LOYALTON PINES

Clean up dead and down along Moss Drive (at least 50-feet on each side) and the area southeast of houses at the end of Sage Road.

SIERRA BROOKS

None other than meeting minimum defensible space requirements.

VERDI

None other than meeting minimum defensible space requirements.

All of the italicize information is directly from the Sierra County Fire Plan 2002[6]

[6] Sierra County Fire Safe Council and Community Fire Safe Plan, September 2002

Table 5: 2002 Fire Plan Recommended Projects

Community	Treatment	Location	Average Width Chains	Length (Estimated) Chains	Area (Estimated) Square Chains	Area (Estimated) Acres	Comments
Alleghany	Fuel Break/DFPZ	South/Downslope	4.0	80.0	320.0	32.0	
Alleghany	Fuel Break/DFPZ	North/West	3.0	80.0	240.0	24.0	
Alleghany	Fuel Break/DFPZ	South/West	3.0	20.0	60.0	6.0	
Alleghany	Modified Roadside FB	Kanaka Creek Road	1.5	20.0	30.0	3.0	No acres if the Downslope and North/West Fuel Breaks are done.
Alleghany	Modified Roadside FB	Hells Half Acre Road	1.5	80.0	120.0	12.0	The lower 10 chains of this is within the North/West Fuel Break.
Alleghany	Modified Roadside FB	Ridge Road (S180)	1.5	300.0	450.0	45.0	All USFS lands except for about 10 chains (1.5 acres).

Alleghany	Modified Roadside FB	Henness Pass Road (S309)	2.0	160.0	320.0	32.0	All NF except for about 40 chains (8.0 acres).
Allegheny Total				**740.0**		**154.0**	
				9.6 miles			
Pike	Fuel Break/DFPZ	South - below Ridge Road (S180)	4.5	200.0	900.0	90.0	Highest priority
Pike	Fuel Break/DFPZ	East	3.8	70.0	266.0	26.6	The eastside of this road for about 50 chains 19.0 acres) is TNF.
Pike	Fuel Break/DFPZ	North	3.8	90.0	342.0	34.2	About 35 chains (13.3 acres) is on NF lands.
Pike	Fuel Break/DFPZ	West	3.8	130.0	494.0	49.4	There are some existing cleared areas along this route such as the large meadow just north of Ridge Road (S180).
Pike	Modified Roadside FB	Northside of Ridge Road (S180)	1.5	160.0	240.0	24.0	Acreage will be less due to homes and Pliocene Ridge School

Pike	Modified Roadside FB	Glory Ridge Road	1.5	50.0	75.0	7.5	
Pike	Modified Roadside FB	Nugget Alley	1.5	15.0	22.5	2.3	
Pike	Modified Roadside FB	Pike City Cutoff	1.5	25.0	37.5	3.8	
Pike	Modified Roadside FB	Poplar Lane	1.5	25.0	37.5	3.8	
Pike	Area Treatment (SPLAT)	Interior - Glory Hole/Grizzly Creek Area				200.0	About 1/2 is TNF of which portions have been underburned.
Pike Total				**765.0**		**441.5**	
Goodyears Bar	Modified Roadside FB	Mountain House Road (S300)	1.5	20.0	30.0	3.0	Not much to do here if individuals do their defensible space.
Goodyears Bar	Modified Roadside FB	Goodyears Creek Road (S400)	1.5	80.0	120.0	12.0	

Goodyears Bar	Modified Roadside FB	Pebble Street	1.5	15.0	22.5	2.3	
Goodyears Bar	Modified Roadside FB	Woodruff Creek Road	1.5	10.0	15.0	1.5	
Goodyears Bar Total				**125.0**		**18.8**	
Downieville	Fuel Break/DFPZ	East	2.0	35.0	70.0	7.0	
Downieville	Fuel Break/DFPZ	West	2.5	25.0	62.5	6.3	
Downieville	Modified Roadside FB	Oxford Mine Road	1.5	30.0	45.0	4.5	
Downieville Total				**90.0**		**17.8**	
				1.1 miles			
Sierra City	Area Treatment	Sacred Mound Road Area				15.0	

Sierra City	Modified Roadside FB	Butte Alley	1.5	30.0	45.0	4.5	
Sierra City	Modified Roadside FB	Wild Plum Road	1.5	60.0	90.0	9.0	
Sierra City Total				**90.0**		**28.5**	
				1.1 miles			
Calpine	Fuel Break/DFPZ	North	3.0	20.0	60.0	6.0	
Calpine	Fuel Break/DFPZ	West	4.0	60.0	240.0	24.0	
Calpine	Fuel Break/DFPZ	South	4.0	80.0	320.0	32.0	
Calpine	Modified Roadside FB	West Main Street	1.5	60.0	90.0	9.0	
Calpine	Modified Roadside FB	Meadow View Road	1.0	60.0	60.0	6.0	Northside only

Calpine	Modified Roadside FB	County Road	1.5	50.0	75.0	7.5	
Calpine	Modified Roadside FB	Wanda Way & Meadow Ranch Court	1.5	5.0	7.5	0.8	
Calpine	Modified Roadside FB	Meadow Ranch Court	1.5	10.0	15.0	1.5	
Calpine	Modified Roadside FB	Catfish Lane	1.5	20.0	30.0	3.0	
Calpine	Area Treatment (SPLAT)	Swedes Unit of Copren Resources				100.0	Guesstimate, would need more detailed analysis. Lower priority than other projects.
Calpine Total				**365.0**		**189.8**	
				4.8 miles			
Sattley	Modified Roadside FB	Cemetery Road	1.5	**20.0**	30.0	**3.0**	

				.25 miles			
Sierraville	Modified Roadside FB	OldTruckee Road	1.5	**35.0**	52.5	**5.3**	
				.44 miles			
Sierra County Total				**2,230.0**		**858.5**	
				28.4 miles			

The Sierra County Fire Safe and Watershed Council has completed several projects since the 2002 Fire Plan. The completed projects are found in Table 6 below.

Table 6: Completed Sierra County projects over the past 10 years

Line No.	**Project Type**	**Grant No.**	Funding Agency	**Grant Funding Amt. ($)**	**Matching Funding Amt. ($)**	**Project Start Date**	**Project Completion Date**	**CWPP Project** Y/N	**Site Improvement & Restoration Projects**		**Sustainable Utilization**		**Community**
									Fuel Reduction: (Mastication, Hand Treatment, Rx Burn, Pile Burning)	**Project Acres Treated**	Bio-mass	Forest Products	
1	Fuel reduction,	11-CA11051756-034	USFS	55,000	0	June-12	Aug-13	Yes	Mastication, Hand treatment	58	No	No	Loyalton Pines
2	Fuel reduction	10USFS0519	USFS CAFS	274,350	72,302	Sept-10	Jun-12	yes	Mastication, Hand treatment, Biomass removal	308	yes	yes	Sierraville, Calpine
3	Fuel reduction	08UFS0179	USFS CAFS	124,966	46,296	May-09	Jun-09	yes	Hand treatment	39	No	No	Alleghany
4	Fuel reduction	07UFS9550	USFS CAFS	110,000	7,205	Jun-08	Nov-08	yes	Mastication	84	No	No	Calpine
5	Fuel reduction	05BLM0195	BLM CAFS	80,000	10,461	Mar-05	Nov-05	yes	Mastication	60	No	No	Pike City
	Fuel Reduction		CalTrans County DOT					Yes	Hand cut and chip	On going			Primary Evacuation route Highway 49

Figure 11: Completed Fuels Project Map

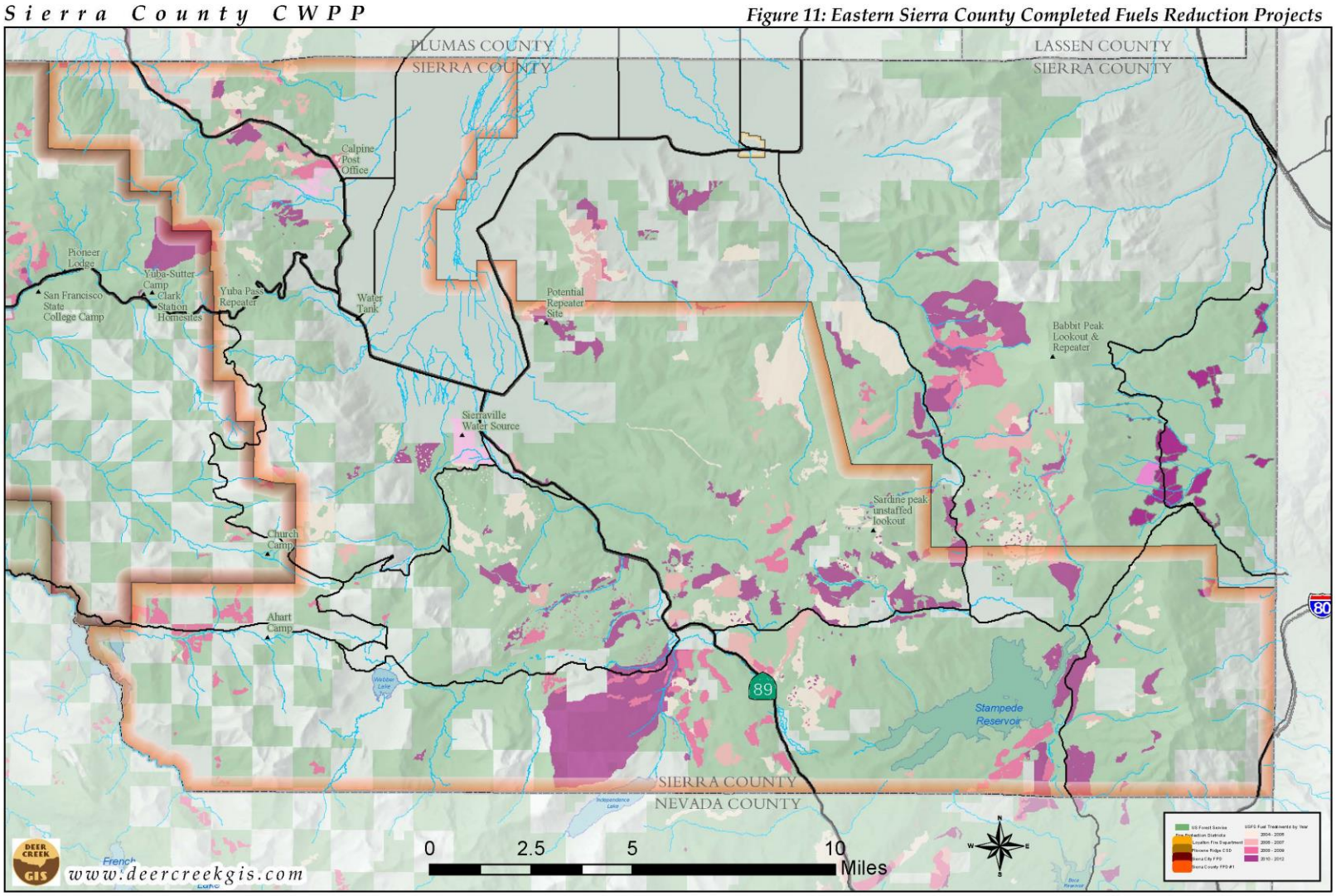
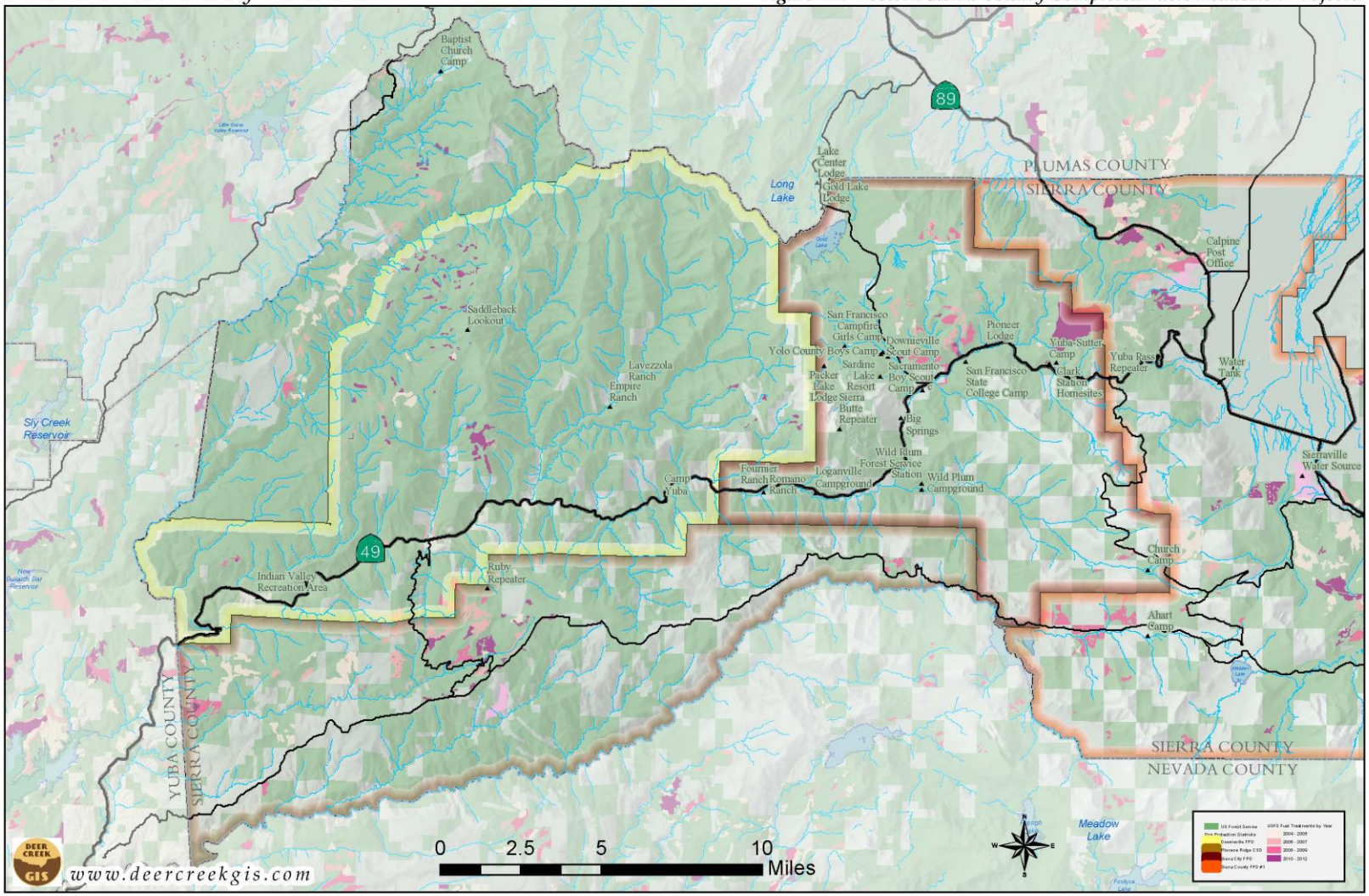


Figure 11 : Western Sierra County Completed Fuels Reduction Projects



Future Projects within Sierra County

The following are projects and treatments proposed for future fuel hazard reduction the US Forest Service projects are followed by projects recommended on private property to provide protection for local communities

US Forest Service Projects

The US Forest Service has developed a list of future fuel treatment projects they include Canyon, Gold Yuba Camp, Trapper, Balsam, and Plum. All of these projects are in various stages of planning and implementation for further clarification contact with the Yuba Ranger District. The map figure 12 shows the locations of the Yuba District Projects that could influence projects within Sierra County

Figure 12: Tahoe National Forest future projects

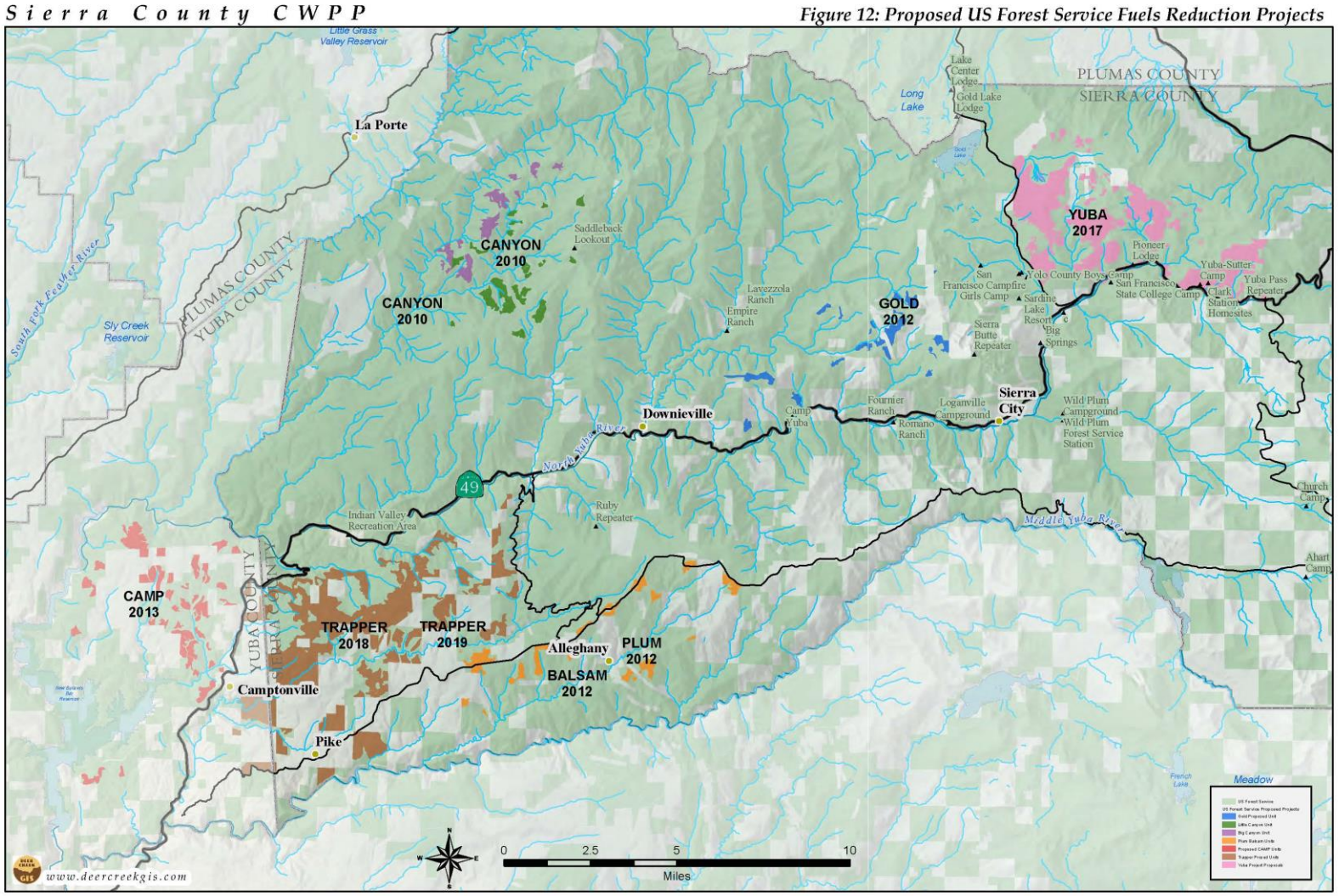
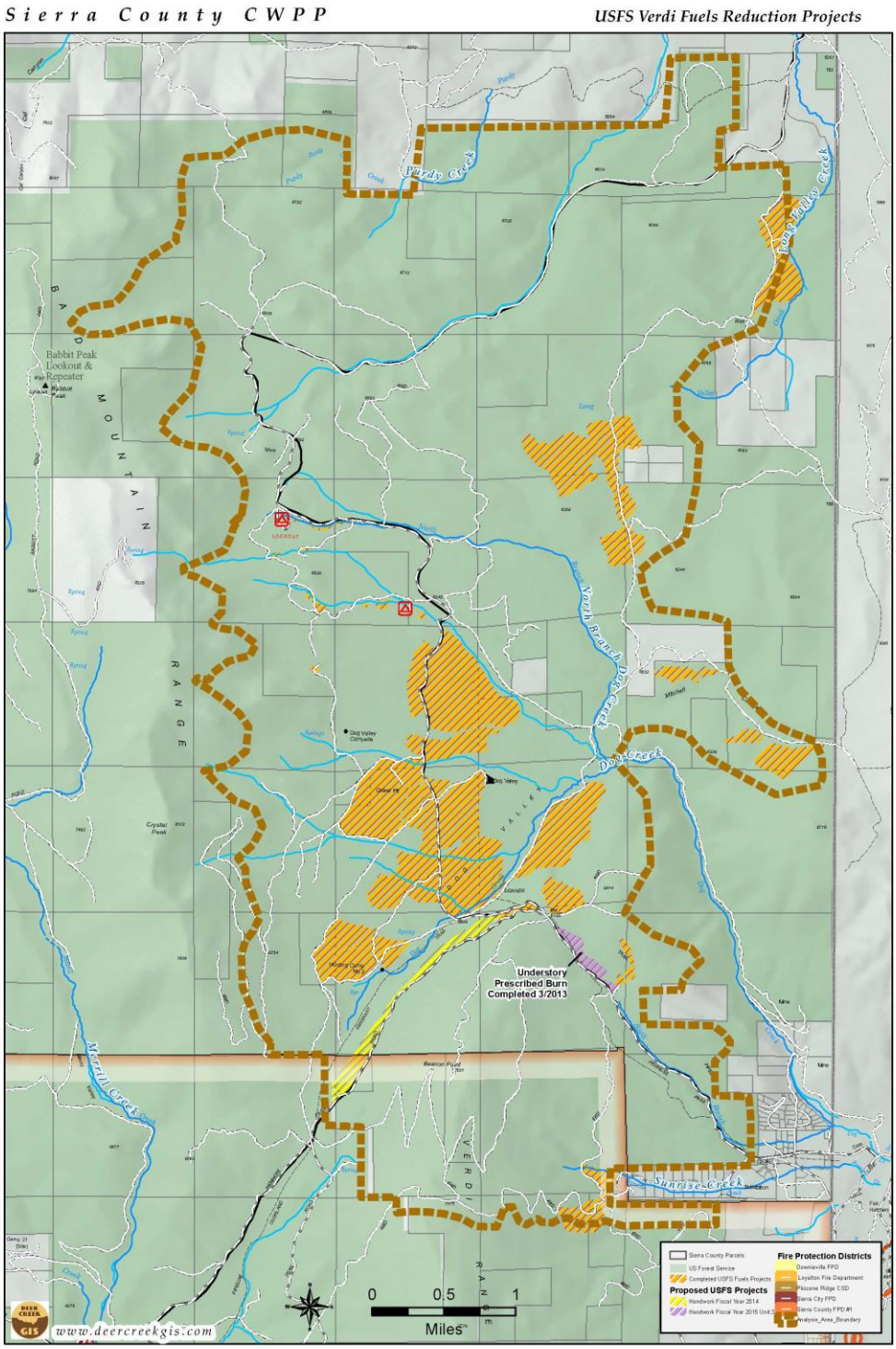


Figure 13: Humboldt-Toiyabe National Forest Verdi projects



Future Projects by Fire District

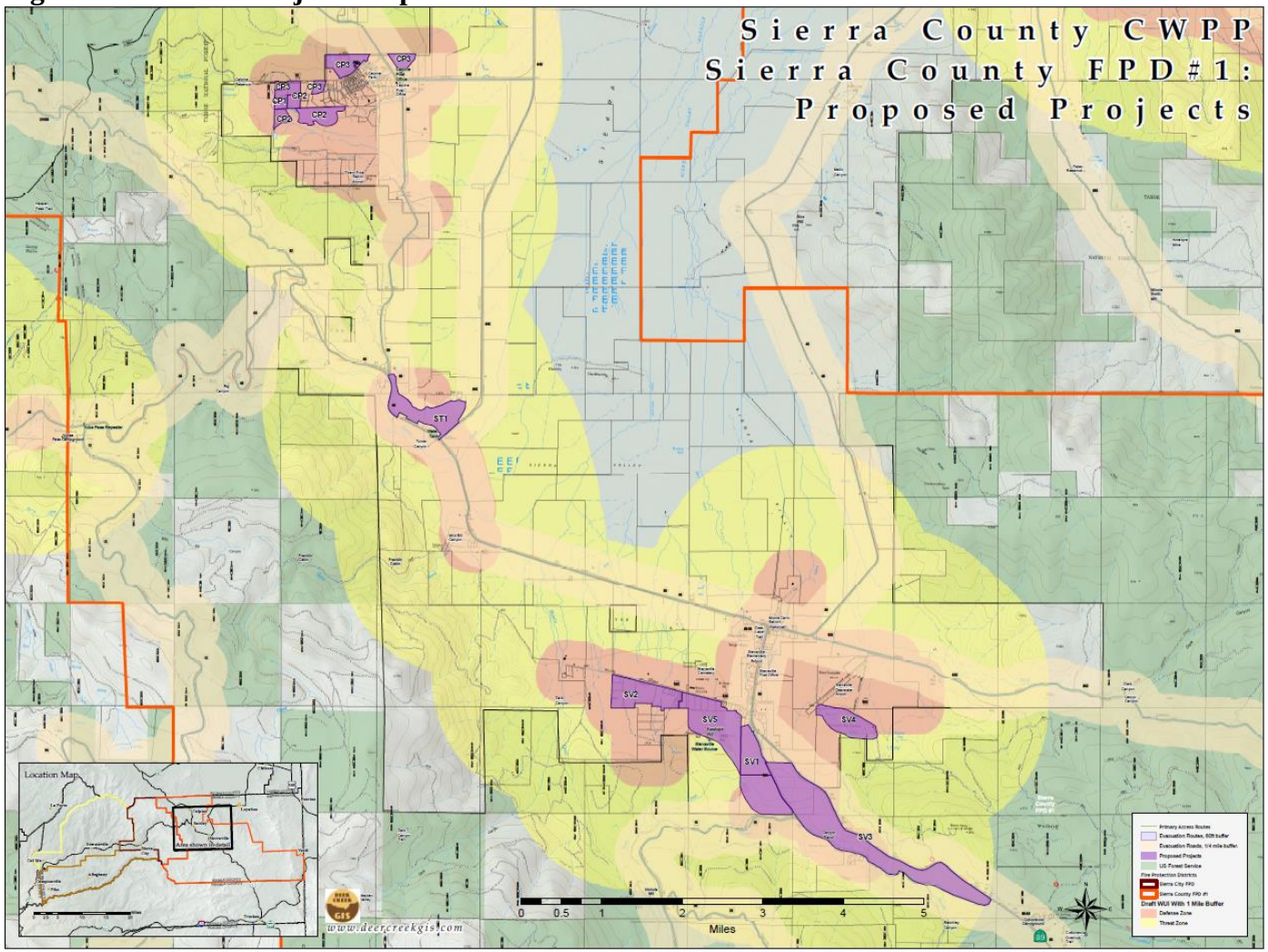
The following is a list of projects recommended in addition to the projects that were not completed from the 2002 Fire Plan. These projects were identified during the stakeholder, community meetings and by the CWPP contractor. The following are tables for each district that projects were identified and maps of the proposed projects

Sierra County Fire Protection District#1 Projects

Table 7: Sierra County Fire Protection District #1 projects

Community	Name	Treatment Type	Road Name	Mechanical	Hand	Prescribed Fire	Acres	Est. Cost	Priority	Est. Year
	SV 1	Fuel Break		yes			58	92,000		
	SV 2	Fuel Break		Yes			96	153,000		
	SV 3	Fuel Break		Yes			320	512,000		
	SV 4	Fuel Break		Yes			70	112,000		
	SV 5	Fuel Break Maintenance		Yes			222	133,200		
	ST 1	Fuel Break		Yes			70	112,000		
	CP2,3	Fuel Break Maintenance		Yes			50	30,000		

Figure 14: SCFPD Projects Map

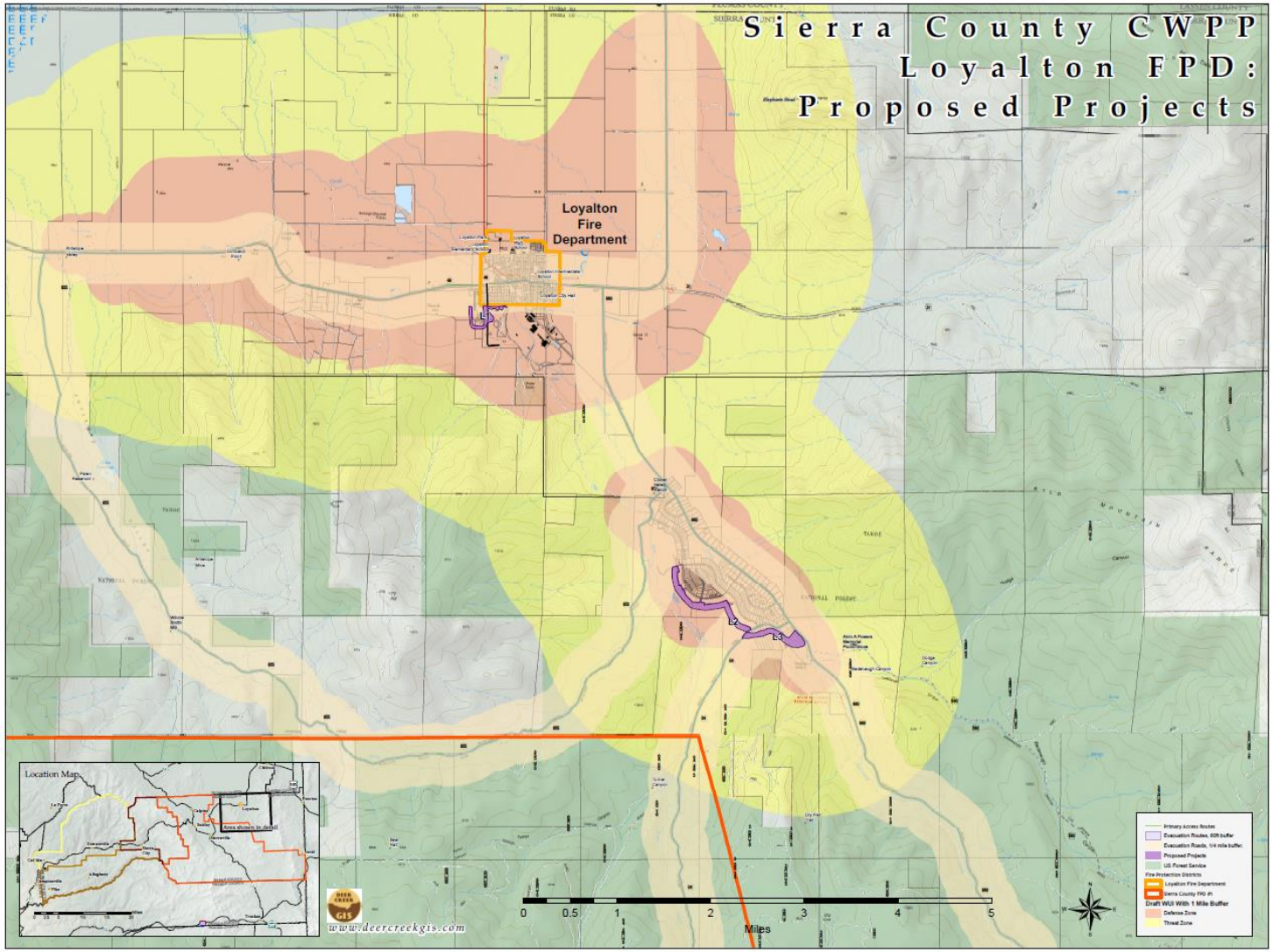


Loyalton Fire Department Projects

Table 8: Loyalton Projects

Community	Name	Treatment Type	Road Name	Mechanical	Hand	Rx Fire	Acres	Est. Cost	Priority	Est. Year
	L 1	Fuel Break		Yes			11	17,600		
	L 2	Fuel Break		Yes			28	44,800		
	L 3	Fuel Break		Yes			20	32,000		

Figure 15: Loyalton Project map



Verdi Area Projects

Table 9; Verdi Projects

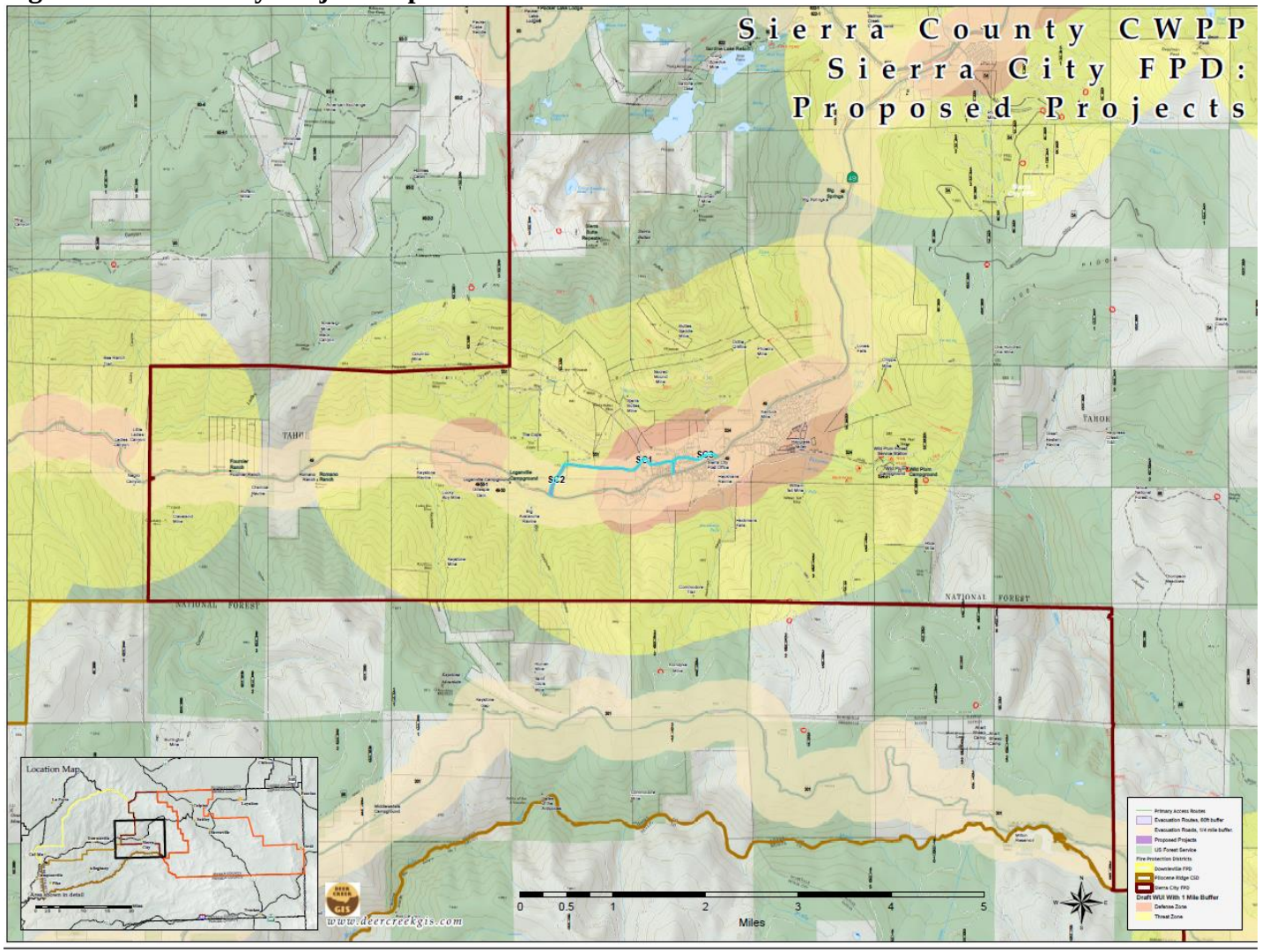
Community	Name	Treatment Type	Road Name	Mechanical	Hand	Rx Fire	Acres	Est. Cost	Priority	Est. Year
	V 1	Fire Station Construction								

Sierra City Fire Protection District Projects

Table 10: Sierra City Projects

Community	Name	Treatment Type	Road Name	Mechanical	Hand	Rx Fire	Acres	Est. Cost	Priority	Est. Year
	SC 1	Roadside Hazard Reduction			Yes		11	25,300		
	SC 3	Roadside Hazard Reduction			Yes		4	9200		
	SC 2	Fuel break 200 ft wide		Yes			4.5	7200		

Figure 16: Sierra City Project map



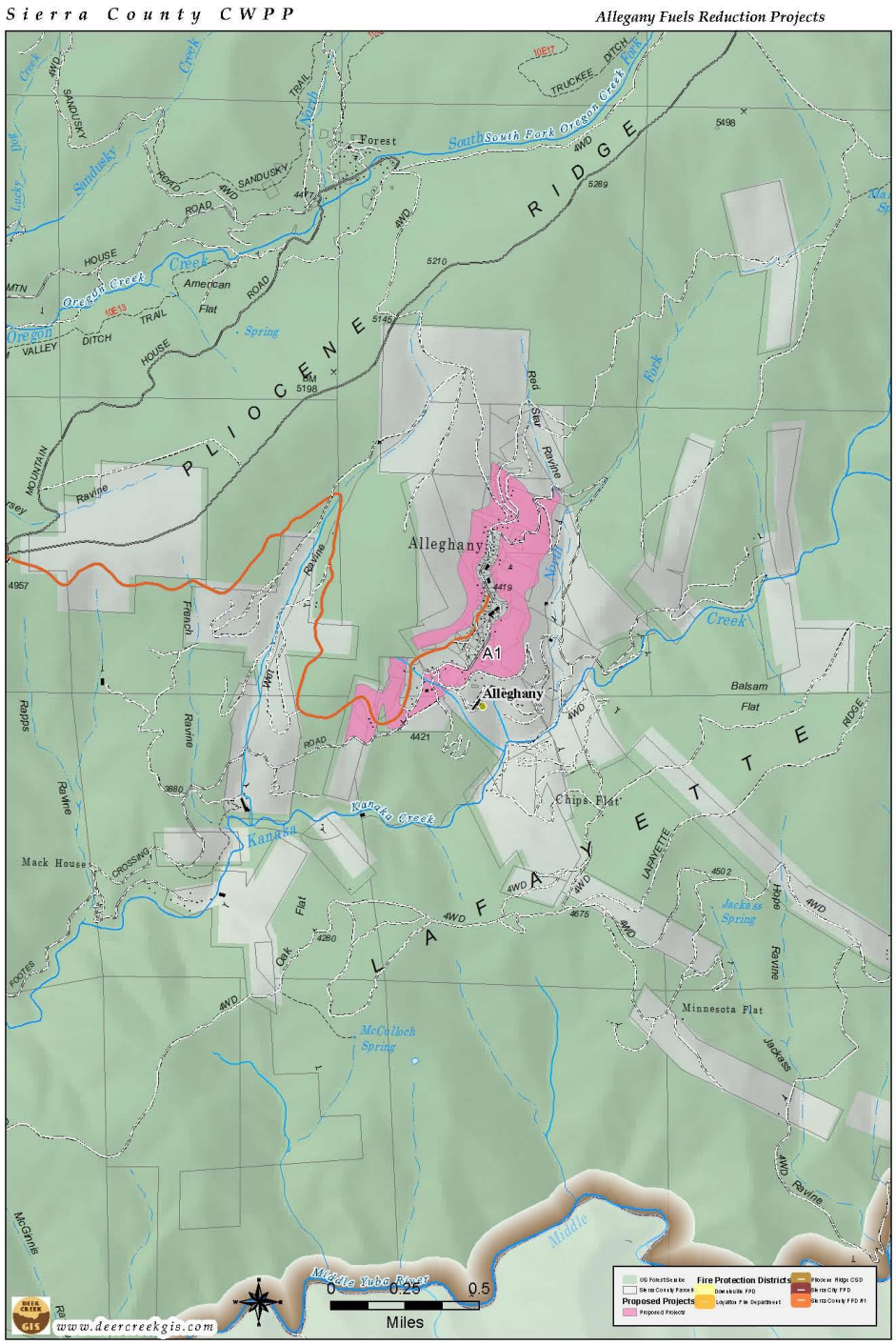
Allegany Fire Department Projects

Table 11: Allegany Projects

Community	Name	Treatment Type	Road Name	Mechanical	Hand	Rx Fire	Acres	Est. Cost	Priority	Est. Year
		Maintenance			Yes		39	39,000		

The map figure 17 shows projects that have been completed or are partially completed these projects should be updated and put into a cycle of maintenance in the next couple of years.

Figure 17: Allegany Project Maps

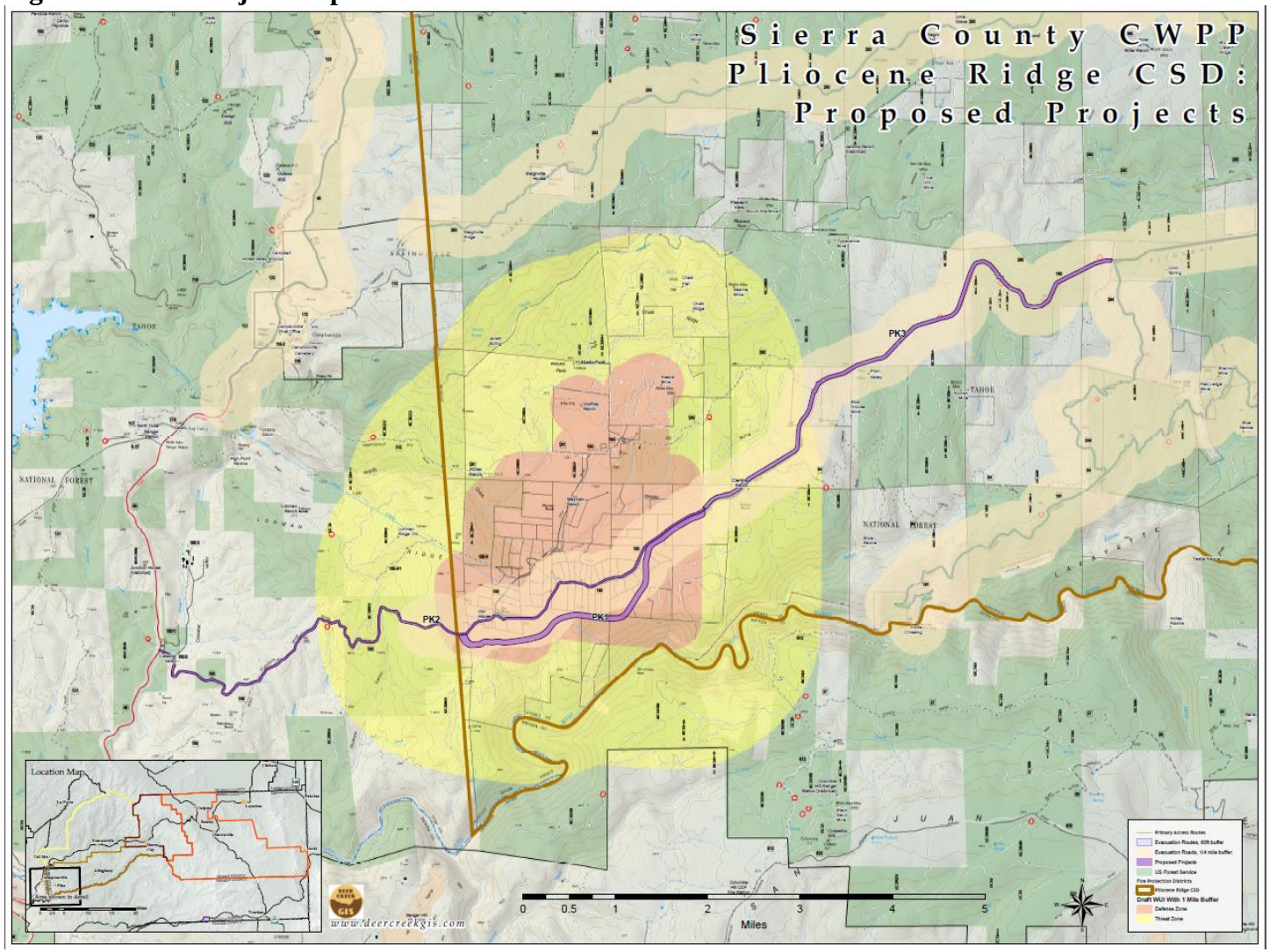


Pike City Fire Department Projects

Table 12: Pike Projects

Community	Name	Treatment Type	Road Name	Mechanical	Hand	Rx Fire	Acres	Est. Cost	Priority	Est. Year
	PK 1	Fuel Break 300 ft wide		Yes			75.4	120,000		
	PK 2	Roadside Hazard Reduction 60 ft on each side of the road			Yes		58.6	134,780		
	PK 3	Roadside Hazard Reduction 100 ft on each side of the road		Yes	Yes		89	142,400		

Figure 18: Pike Project Map

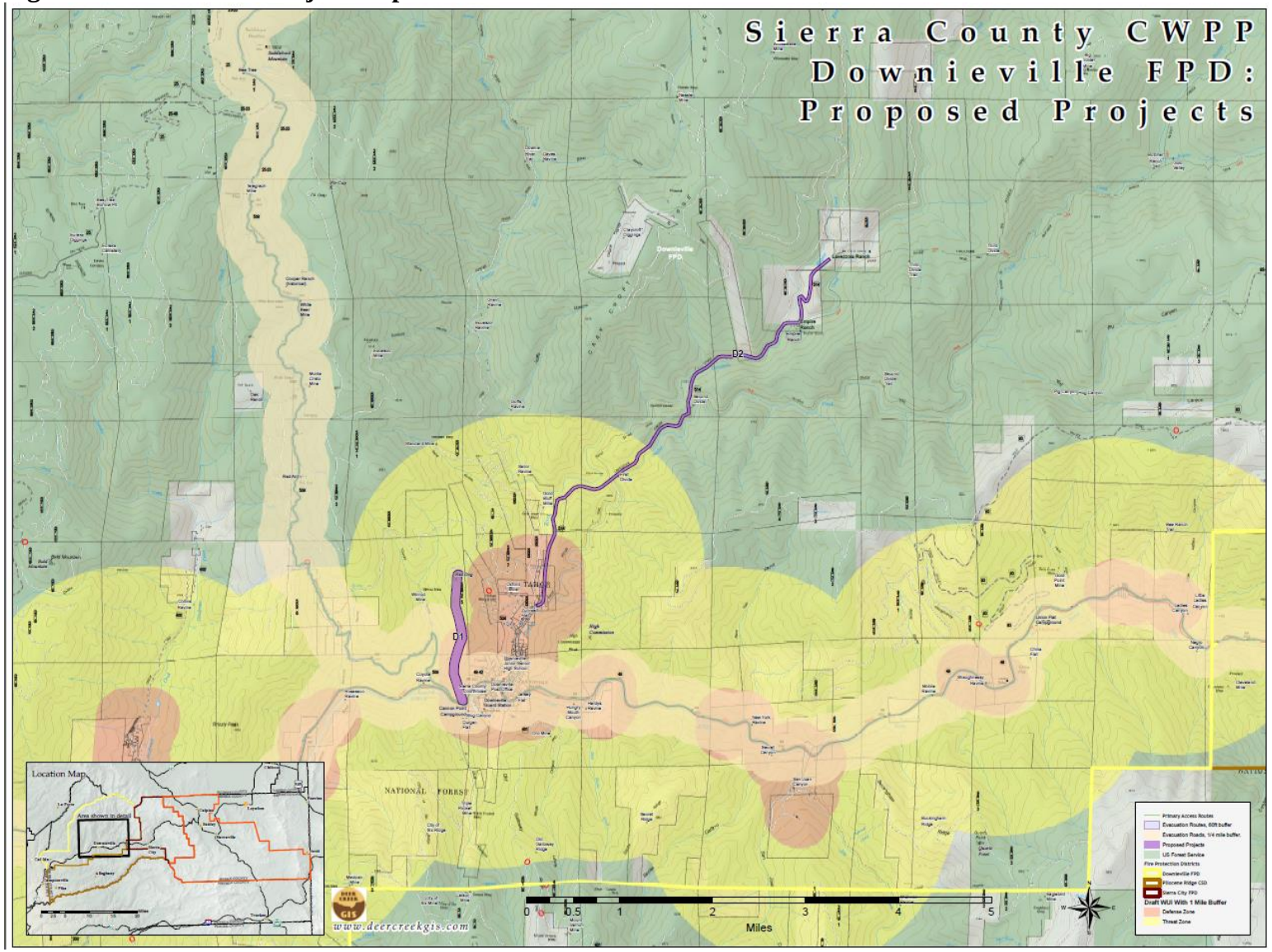


Downieville Fire Protection District Projects

Table 13 Downieville Projects

Community	Name	Treatment Type	Road Name	Mechanical	Hand	Rx Fire	Acres	Est. Cost	Priority	Est. Year
	D1	Fuel Break		Mastication			55	88,000		
	D2	Roadside Thinning 60 ft. on each side of the road	FS Road 514 to Empire Ranch		Cut and Chip 60 ft on each side of the road		65	149,500		

Figure 19: Downieville Project Maps

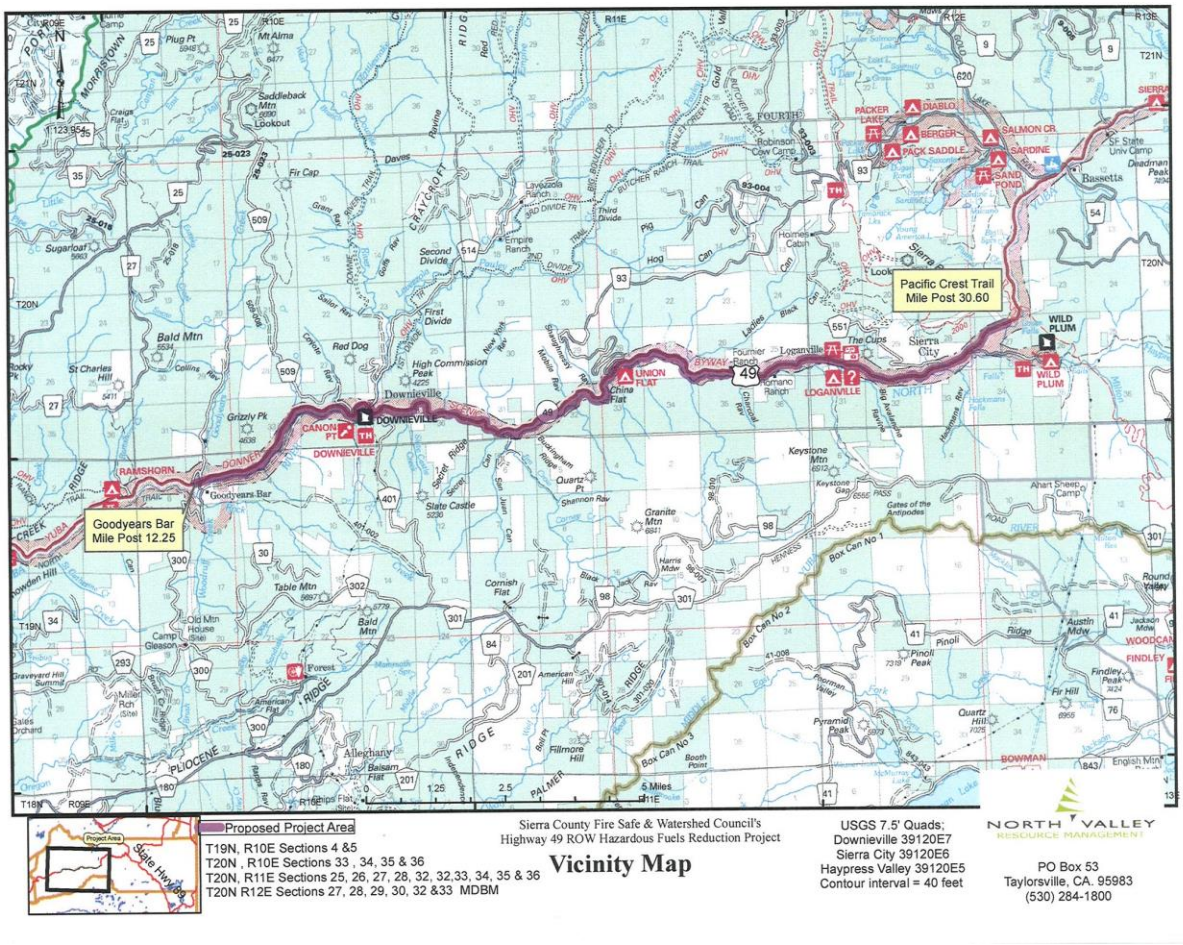


Sierra County Fire Safe and Watershed Council, projects

The Sierra County Fire Safe and Watershed Council had created two projects that were submitted for grant funding but the projects were not funded at the time and the Council wishes to resubmit them for future funding.

Highway 49 ROW Hazardous Fuels Reduction Project

The project is located along Highway 49 from just west of Goodyears Bar to just east of Sierra City. The documentation for the project is attached along with the Decision Notice to this document



The second project was one submitted by the Fire Safe Council in 2013 to the Sierra Conservancy but rejected and needs to be revisited and resubmitted for grant funding to other Granters. It is also found in the attachments

Fuels Treatments and Restoration Projects
Treatment Costs

The following table is a list of costs for various types of treatments. The costs were derived from treatments that have occurred in El Dorado County over the past 8 years. Recommendations for treatments and prescriptions can be found in Appendix B

The costs in the following table may be used for costing grant requests for proposals

Table 14: Treatment Costs

Fuel Reduction Treatment	Cost per acre
Mechanical thinning (urban interface)	$1,000-$3,200
Mastication	$700 - $1,500
Prescribed burning	$400-$900
Hand thin and Chip	$1000 - $2,350
Pile Burn	$300 - $700
Machine Pile	$185-$275

The costs displayed in Table 14 are based on contractor costs for the treatment plus management and CEQA documentation and are based on various projects throughout the northern Sierra area. The mastication is 1600 dollars per acre and the cut and chip hand treatment is 2300 dollars per acre, maintenance of existing treatments are approximately 600 dollars per acre. Prescribed burn costs should go down substantially with follow-up burning, burning usually takes two or three entries to reduce the fuels affectively. The environmental document costs can vary depending on the requirement for field surveys which can increase the cost per acre

The community comments included some recommendations for projects that were not added to the list of projects in this document but warrant looking at in the future in cooperation with the US Forest Service. They were:

- Broadcast burning on the slope north of Sierra City
- Providing a wider fuel reduction along the Pacific Crest Trail north of Sierra City
- Expanding the Highway 49 road side hazard reduction to the east to Sierraville

VII. Monitoring and Evaluation

A CWPP does not end when it is adopted; a thorough process should involve a continuous cycle of collaborative planning, implementation, monitoring and adapting strategies based on lessons learned. As communities learn from successes and challenges during the development and implementation of their CWPP, stakeholders may identify new actions, propose a shift in how decisions are made or actions are accomplished, and evaluate the resources necessary for successful CWPP implementation.

- Track accomplishments and identify the extent to which CWPP goals have been met.
- Examine collaborative relationships and their contributions to CWPP implementation, including existing participants and potential new partners.
- Identify actions and priority fuels reduction projects that have not been implemented, and why; set a course for future actions and update the plan.

Table 12 is a framework that can help a community in monitoring and evaluating its CWPP. The table lists six CWPP goals and a series of questions to help communities monitor and evaluate accomplishments, challenges, and how well goals have been met. Communities and agencies may want to work together to ensure that, at a minimum, data are collected to evaluate the plan measures to gain consistency. The community must recognize that fire safety is rapidly changing. It is likely that new developments and new sources of money in fire safety will change from year to year. It is recommended that this plan be reviewed on an annual basis by the fire districts with updates every 5 years or sooner if necessary.

Table 15: Framework for Monitoring and Updating the CWPP

1. Partnerships and Collaboration	1.1 Who has been involved with CWPP development and implementation? How have relationships grown or changed through implementation? What resources did they bring to the table?
	1.2 Have partners involved in the planning process remained engaged in implementation? Have new partners become involved? How have the relationships established through the CWPP enhanced opportunities to address CWPP goals?

	1.3 How has the collaborative process assisted in implementing the CWPP and building capacity for the community to reduce wildfire risk?
	1.4 Has CWPP collaboration made a difference or had a positive impact on local organizations, neighborhoods and/or actions?
2. Risk Assessment	2.1 How has population growth/change and development in your community affected wildfire risk?
	2.2 Are there new or updated data sources that may change the risk assessment and influence fuels priorities?
	2.3 Has the community enacted a wildfire-related ordinance? If so, county, state, or local?
	2.4 Has the community enforced local or CPR 4291 ordinances
3. Reducing Hazardous Fuels	3.1 How many acres have been treated for hazardous fuels reduction on public and private land that were identified as high-priority projects in the CWPP? What percentage of total acres treated does this constitute?
	3.2 How many fuels reduction projects have spanned ownership boundaries to include public and private land?
	3.3 What is the number and percent of residents that have participated in projects and completed defensible space on their land?
	3.4 How many hazardous fuels reduction projects have been implemented in connection with a forest restoration project?
	3.5 Economic development resulting from fuels reduction How many local jobs have resulted because of fuels reduction or restoration activities?
	3.6 Evaluate any CWPP fuels treatment utilized during suppression for effectiveness

4. Reducing Structural Ignitability	4.1 What kind of resource losses (homes, property, infra-structure, etc.) have occurred from wildfires?
	4.2 Are the current codes and regulations for wildfire hazard adequate? If not, are there efforts to change or update them? Are there action items in the CWPP to develop codes and recommendations?
	4.3 Has the public knowledge and understanding about structural ignitability been increased by strategies adopted in the CWPP? Have homeowners been educated on how to reduce home ignitability, and are they replacing flammable building components with non-flammable materials?
	4.4 How many Firewise Communities have been recognized? How many citizens, neighborhoods, or communities have taken action to increase the resilience of their structure to fire?
	4.5 How has the availability and capacity of local fire agencies to respond to wildland and structural fires improved or changed since the CWPP was developed?
5. Education and Outreach	5.1 What kind of public involvement has the CWPP fostered? Examples include public education, household visits, demonstration projects, etc.
	5.2 Has a change in public awareness about wildfire resulted from the plan?
	5.3 What kinds of activities have citizens taken to reduce wildfire risk?
6. Emergency Management	6.1 Is the CWPP integrated within the county or municipal Emergency Operations Plan?
	6.2 Does the CWPP include an evacuation plan? If yes, has it been tested or implemented since the CWPP adoption?
	6.3 Is the CWPP aligned with other hazard mitigation plans or efforts?

	6.4 Is the Evacuation Website operational been updated with new information

* Include goals that can be evaluated with measures as part of a local CWPP evaluation process. This table identifies specific measures that relate to outcomes that can be evaluated at a national level and are associated with HFRA or identified within the 10-Year Implementation Plan.

Appendixes

Appendix A: Sierra County Fire Behavior Modeling
Model Descriptions
(from http://www.fire.org/)

FLAMMAP

FlamMap is a fire behavior mapping and analysis program that computes potential fire behavior characteristics (spread rate, flame length, fireline intensity, etc.) over an entire FARSITE landscape for constant weather and fuel moisture conditions.

- FlamMap software creates raster maps of potential fire behavior characteristics (spread rate, flame length, crown fire activity, etc.) and environmental conditions (dead fuel moistures, mid-flame wind speeds, and solar irradiance) over an entire *FARSITE* landscape. These raster maps can be viewed in FlamMap or exported for use in a GIS, image, or word processor.
- FlamMap is not a replacement for *FARSITE* or a complete fire growth simulation model. There is no temporal component in FlamMap. It uses spatial information on topography and fuels to calculate fire behavior characteristics at one instant.
- It uses the same spatial and tabular data as *FARSITE*:
  - a Landscape (.LCP) File,
  - Initial Fuel Moistures (.FMS) File,
  - optional Custom Fuel Model (.FMD),
  - optional Conversion (.CNV),
  - optional Weather (.WTR), and
  - optional Wind (.WND) Files.
- It incorporates the following fire behavior models:
  - Rothermel's 1972 surface fire model,
  - Van Wagner's 1977 crown fire initiation model,
  - Rothermel's 1991 crown fire spread model, and
  - Nelson's 2000 dead fuel moisture model.
- FlamMap runs under Microsoft Windows operating systems (Windows 95, 98, me, NT, 2000, and XP) and features a graphical user interface.
- Users may need the support of a geographic information system (GIS) analyst to use FlamMap because it requires spatial coincident landscape raster information to run.

FlamMap is widely used by the USDI National Park Service, USDA Forest Service, and other federal and state land management agencies in support of fire management activities. It is designed for use by users familiar with fuels, weather, topography, wildfire situations, and the associated terminology. Because of its complexity, only users with the proper fire behavior training and experience should use FlamMap where the outputs are to be used for making fire and land management decisions.

Fire behavior indicators

Crown Fire

- Fire type 1 is a surface fire; the fire is generally on the ground, high likelihood of initial attack success.
- Fire type 2 is a passive crown fire, (torching and short range spotting).
- Fire type 3 is an active crown fire, (fire actively moving in the crowns of trees with mid to long range spotting).

Figure 20 Flame Length Map

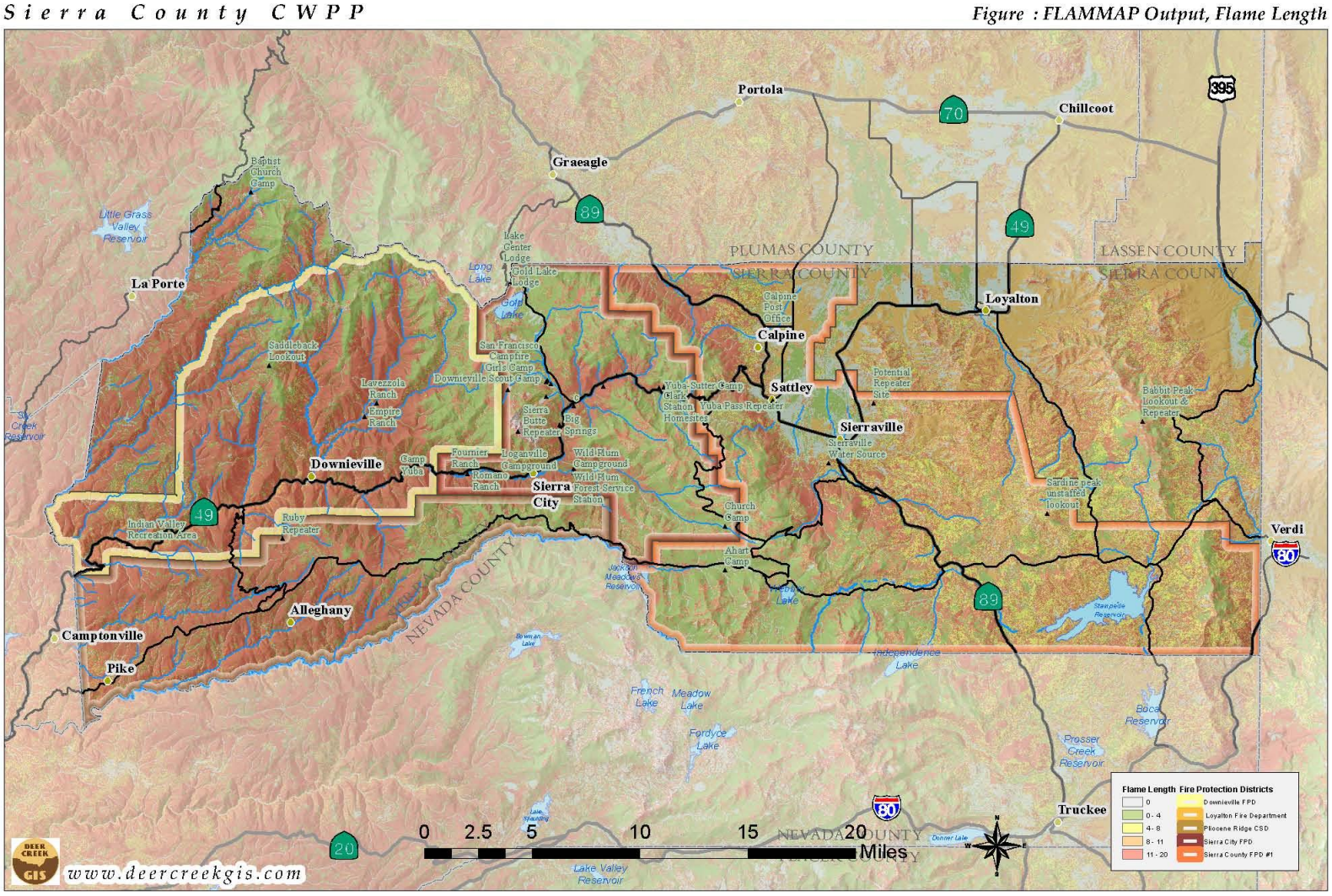


Figure 21: Rate of Spread Map

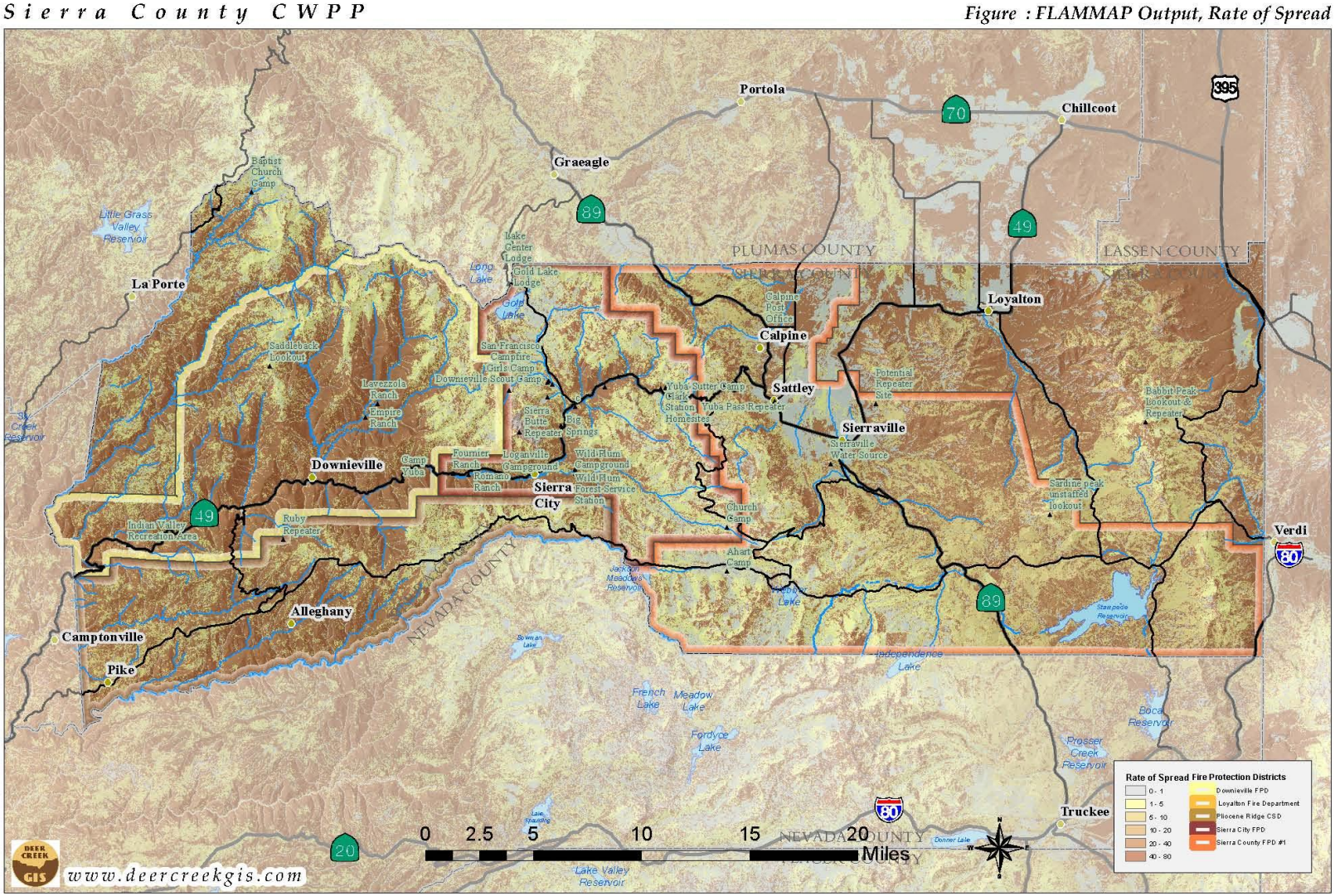
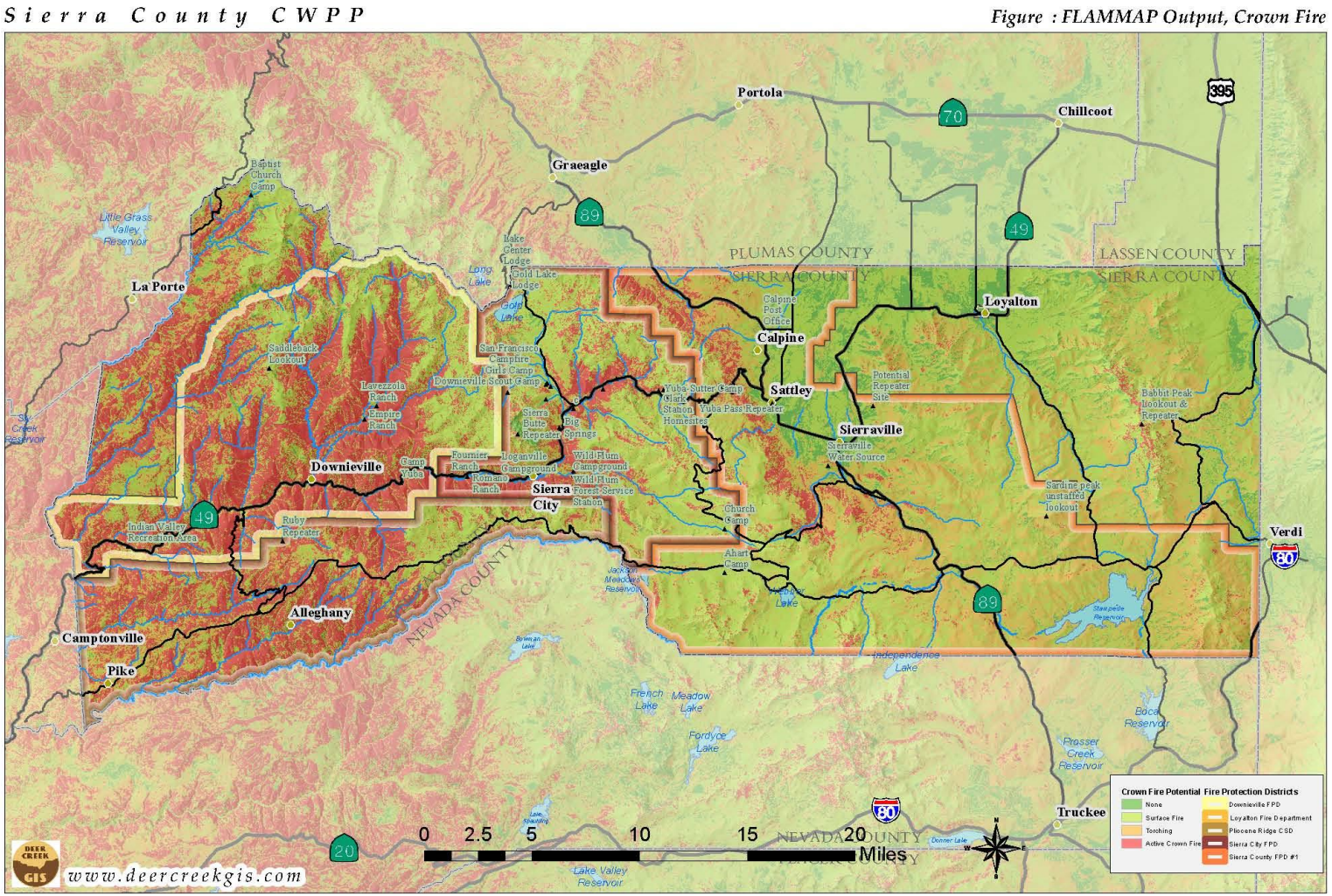


Figure 22: Crown Fire Potential Map



Appendix B: Treatment Descriptions and Prescriptions

Fuel Treatment and Restoration Projects Strategy these are a few landscape treatments designed to support wildland fire suppression, demonstration projects designed to educate, roadside treatments designed to facilitate safer evacuations, maintenance treatments and critical individual clearance zones that minimize structure-to-structure ignitions. (CPRC - 4291 and Open Space Treatments)

Treatment Prescriptions

The following treatment techniques are typical of those currently used by the, private forest landowners, the U. S. Forest Service, and described in the Sierra Nevada Framework. It was assumed that no new roads would be constructed to implement the projects. The following is a brief description of potential treatment techniques that could be employed to accomplish fuels treatment.

Mechanical Thinning

Mechanical thinning utilizes heavy equipment with large hydraulically-driven saws to cut and remove trees (generally under 24 inches in diameter). The two major harvesting methods include "whole tree removal (WTR)" and "cut-to-length (CTL)". CTL machines use a "stroke delimber" to remove branches before automatically cutting a log to predetermined lengths (Figure 7). While whole tree removal is preferable from a fuels-reduction standpoint, CTL machines create a mat of slash on which they can operate, reducing impacts to the soil. The slash vs. soil disturbance tradeoff must be considered on a site-specific basis. It is possible to use an in-woods chipper to reduce surface fuels in concert with CTL. Mechanical thinning equipment is generally confined to slopes less than 30%. WTR projects require large landings than can accommodate a skidder operation, a large chipper, and semi-trucks. CTL operations require fewer and smaller landings.

Mechanical Thinning using a cut-to-length harvesting system.

Mechanical thinning has the ability to create a more precisely targeted stand structure than prescribed fire (Agee and others 2000, Omi,2002)[7]. The net effect of removing ladder fuels is that surface fires burning through treated stands are less likely to ignite the overstory canopy fuels. By itself, mechanical thinning with machinery does little to beneficially affect surface fuel loading. The only exception is that some level of surface fuel compaction, crushing, or mastication may occur during the thinning process. Depending on how it is accomplished, mechanical thinning may add to surface fuel loadings, thereby increasing surface fire intensity. It may be necessary to remove or treat fine fuels that result from thinning the stand (Graham, 2004).

Prescription Mechanical Thinning: Thin stands from below by removing trees up to 30 inches in diameter at breast height (DBH). The thinning is done by starting with the smallest diameter class; removing sufficient suppressed and intermediate trees to achieve an average crown base height (distance from the ground to the base of the leaf [needle] crown) of at least 20 feet and

---

[7] Omi, Philip, Martinson, Eric, 2002, **Effect of Fuels Treatment on Wildfire Severity,** Western Forest Fire Research Center, Colorado State University

Agee J.K., Bahro, B., Finney, M.A., Omi, P.N., Sapsis, D.B., Skinner, C.N., van Wagtendonk, J.W., and C.P. Weatherspoon. 2000. **The use of shaded fuelbreaks in landscape fire management,** *Forest Ecology and Management* 127: 55-56

spacing of 10 feet between the crowns of residual trees. On drier sites and on southern aspects, favor the removal of white fir over all other conifer species.

Retain 2-5 snags per acre (minimum size of 24 inches dbh) and 3-7 large downed logs per acre (minimum size 14 inches dbh and 20 feet long). The trees are removed by whole tree yarding and or disposing of slash in stands by hand piling and burning, or by chipping and scattering.

Mastication

Mastication requires machines to grind, rearrange, compact, or otherwise change fire hazard without reducing fuel loads. These treatments tend to be relatively expensive, and are limited to relatively gentle slopes and areas of high values (near homes and communities). Rocky sites, sites with heavy down logs, and sites dominated by large trees are difficult places in which to operate mastication equipment. Additionally, sparks from mastication heads have the potential to start fires and, when working on public land, these machines are subject to the same activity-level restrictions that apply to most other logging equipment.

The ecological and fire effects of mastication treatments vary depending on the size, composition, and location of the fuels left after treatment (Graham and others 2000). In many cases, mastication creates a window of 2-5 years in which surface fire intensity actually increases. While this may be offset by a decrease in crown fire potential, mastication tends to increase fuelbed continuity, and can increase fire rates of spread. Mastication is a useful tool in plantations and brushfields, and has applications in thinning small trees for fuelbreak maintenance.

Prescription Mastication: Use rubber tired or low impact tracked vehicles to cut, chip, and scatter all shrubs and small trees up to 10 inches dbh on site. White fir should be the priority for tree removal. Brush cover should be reduced by creating a mosaic of treated and untreated shrubs. Openings between shrubs should be twice the height of the shrubs and 50-70% of the shrubs should be treated. Brush that is treated should be cut to the maximum stump height of 6 inches. No individual pieces of cut material should be greater than 4 feet long. All masticated stumps should be cut to within 6 inches of the ground. Debris should not average more than two inches in thickness over the entire project area. All cut vegetation should be kept within the unit boundaries. Any cut vegetation falling into ditches, roads, road banks, trails, or adjacent units should be removed immediately.

Tractor Piling or Grapple piling: Use of rubber tired or tracked machines to pile slash, brush and small trees. Where needed trees under 8" DBH will be thinned out to 20' spacing. Most trees over 8" DBH will not be piled. Live oak will be thinned out in many places. Generally Black oak will be left on site Protection of desirable residual trees from skin ups and damage is very important. Slash piles should not be piled near residual tress so when they are burned the piles will not damage trees remaining onsite. Contractor should create clean piles that are free of

dirt and no larger than 15 feet tall and 15 feet in diameter. The piles should be partly covered with a 6'x6' piece of water proof material to allow them to be burned after significant rain fall.

Mastication Soil Issues

Thin layers of wood chips spread on the forest floor tend to dry and rewet readily. Deep layers of both chips and chip piles may have insufficient air circulation, making poor conditions for decomposition. Moreover, when layers of small woody material are spread on the forest floor and decomposition does occur, the decomposing organisms utilize large amounts of nitrogen reducing its availability to plants. Therefore, the impact of any crushing, chipping, or mulching treatment on decomposition processes and their potential contribution to smoldering fires needs to be considered (Graham, 2004)[8].

Prescribed Burning

Prescribed burning reduces the loading of fine fuels, duff, large woody fuels, rotten material, shrubs, and other live surface fuels. These changes, together with increased fuel compactness and reduced fuel continuity change the fuel energy stored on the site, reducing potential fire spread rate and intensity. Burning reduces horizontal fuel continuity (shrub, low vegetation, woody fuel strata), which disrupts growth of surface fires, limits buildup of intensity, and reduces spot fire ignition probability (Graham, 2004). Given current accumulations of fuels in some stands, multiple prescribed fires—as the sole treatment or in combination with thinning—may be needed initially, followed by long-term maintenance burning or other fuel reduction (for example, mowing), to reduce crown fire hazard and the likelihood of severe ecosystem impacts from high severity fires. Ecologically speaking prescribed burning is the best treatment for the vegetation types in the Sierra County CWPP area but reconginzing that it will be important to gain support for prescribed fire use first.

[8] Graham, R.T., Sarah McCaffrey and Jain Theresa. 2004. **Science Basis for Changing Forest Structure to Modify Wildfire Behavior and Severity**, RMRS-GTR-120, April 2004

Prescription for Prescribed Burning: Low intensity broadcast burning should be used to reduce all 100-hour fuels (< 3 inches diameter) by 60-80%, the brush component by 50%, and 75% of trees less than 3 inches dbh. Use fire to prune ladder fuels by scorching the lower 1/3 of branches on 100% of trees less than 8 inches dbh. Retain large down logs (20 inches in diameter or greater) to a maximum density of five per acre. Maintain 60 to 70% of ground cover on slopes 35% or less. Additionally, acceptable standards for prescribed fires should include:

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

Do not ignite fires in Steam Environmental Zones (SEZ). However, allow backing fires to enter SEZs affecting a maximum of 45% of the area in a mosaic pattern. No more than 50% of the 100-hour fuels (<3 inches diameter) should be consumed in SEZ's.

Opportunities to use prescribed fire are limited because of smoke management concerns.

Hand Thinning and Chipping

Hand thinning and chipping is usually accomplished by a crew of persons using chainsaws and pole saws to thin and clear undesirable vegetation. Hand thinning is conducted with crews of approximately 10 individuals who cut trees with chainsaws. Hand thinning is generally used to

cut smaller trees (less than 14 inches dbh), on steep slopes where machines cannot operate, or in environmentally sensitive areas where machines would have a significant environmental impact. Removal of smaller trees is generally limited to younger stands where the trees are smaller. Because hand thinning can only effectively remove smaller material, silvicultural and fuel management objectives may be more constrained than those achieved with mechanical thinning. Therefore, hand thinning may require more frequent treatments to maintain acceptable fuel loads than mechanical thinning and hand thinning may not be cost effective in forest stands with excessive ground fuel loading where mechanical thinning would remove or compact those fuels.

Prescription Hand Thin and Pile Burn: Hand thinning and pile burning should be accomplished using a ten person hand crew with chainsaws. Starting with the smallest diameter trees, remove trees up to 6 inches dbh to achieve spacing of 20 feet between residual crowns. All dead and down material greater than 3 inches in diameter and up to 8 inches in diameter and all cut material regardless of size should be piled for burning. Piles should be constructed compactly, beginning with a core of fine fuels and minimizing air spaces to facilitate complete combustion. Piles should be constructed away from trees to prevent damage when burning and should not be taller than 5 feet. If broadcast burning is not scheduled for the area, then a fire line should be surrounded around each pile. Piles will be covered with a 4x4 foot square of water resistant paper to cover the fine material in the center of the piles.

Chipping: Chipping may be used as an alternative to burning. It redistributes forest vegetation that is cut by mechanical thinning or hand thinning. The chips may be removed from the site and converted to energy for other products, or they can be scattered throughout the project area.

Grazing: Use of Goats sheep, horses or cows to reduce the small fuels such as grass, Black Berries and small brush

Cost Estimates

Cost estimates (Table 14) developed as part of this planning effort are based on data from projects completed in the central Sierra mountain area from Plumas County south to Amador County. Cost estimates vary widely because of fuel loadings, operational constraints, and crew capabilities. The costs are limited to the direct cost of project implementation. These cost estimates **do not include** offsetting revenue that may be generated by providing commercial products, costs associated with project planning or preparation of environmental compliance reports, or administrative overhead incurred during implementation.

Administrative cost are approximately 40% of the total project costs if the project is estimated to be $100,000 for on the ground implementation the administrative costs would be $40,000. Administrative costs would include environmental documentation, financial administration, project layout and contract administration.

Appendix C: Useful Resources in Pre Fire and Emergency Planning

1. Get a Kit, 2. Make a Plan, 3. Be Informed http://www.readyforwildfire.org/

Making your Family Disaster Plan http://www.ready.gov/america/makeaplan/index.html

Disaster Planning guide template http://ready.adcouncil.org/beprepared/fep/index.jsp

California Emergency Management Agency http://www.calema.ca.gov/

Sierra County Home Page **http://www.sierracounty/**

State of CA
http://www.fire.ca.gov/fire_prevention/fire_prevention_wildland_codes.php

Builders Wildfire Mitigation Guide http://firecenter.berkeley.edu/bwmg/

Wildfire Preparedness for horse owners http://www.ext.colostate.edu/pubs/livestk/01817.html

California Fire Safe Council http://www.firesafecouncil.org/

Sierra County Fire Safe Council

Red Cross - Sacramento/Sierra Chapter http://sacsierraredcross.org/

Fire Adaptied Communities (Educational Resource) http://www.fireadapted.org/

Firewise Communities (Educational Resource) http://www.firewise.org/

Appendix D: Community meeting Questionnaire and Results

COMMUNITY WILDFIRE PROTECTION PLAN (CWPP)

QUESTIONNAIRE

We live in an area which has a history of large, devastating wildland fires and which is currently described as an area of "High Fire Hazard area". As a first step please take a moment or two to complete the following questionnaire. This community sample will be important in setting priorities for the planning effort.

Please number the following in the order of importance to you from the standpoint of surviving a wildfire. The most Important should be numbered 1 and the rest numbered in declining order of importance to you. What you feel is critical to you may not be as important to your neighbor because of location or other considerations.

List your name, address, email address, and phone number if you feel you would like further input to the Community Wildfire Protection Plan.

1. _____Adequate road signing and building numbering to allow prompt fire and emergency responses.

2. ____Adequate storage of firefighting water and locations of tanks, ponds, pools, etc.

3. ____Adequate communications and / or an early warning system in the case of fire.

4. ____Adequacy of compliance with Fire Safe Regulations, annual cleanup, etc.

5. ____Adequacy of Fire Suppression Forces - Response time, strength of attack, etc.

6. ____Adequacy of emergency Ingress and Egress.

7. ____The need for roadside hazard reduction to make evacuation routes safe

8. ____The need for wildfire Safe Haven Areas or Refuge in Place sites.

9. _____The need for strategic fuel modifications (Fuel breaks, etc.)

<u>The following are to be answered with a range from 1 to 10, 10 being the most aware 1 not at all</u>

1. Awareness of residents to the risk of wildfire.
2. Commitment of residents to implement fire safe recommendations.
3. Homeowner's Insurance is available to all respondents.
4. Aware of the requirements for hazardous fuels reduction around your home and the applicable state law
5. Do you have an evacuation plan?
6. Other Concerns (List here and continue on the back of this page

The questionnaire was distributed at the two community meetings one in Sierraville and one in Downieville the following are the results of those meetings

The first group of questions 1 through 9 the three top vote getters were Item 2 Adequate storage of firefighting water and locations of tanks , ponds, pools etc. 3 Adequate communications and/or an early warning system in case of fire. 5. Adequacy of Fire Suppression Forces – response time, strength of attack. These questions received the highest number of responses. The second group of questions were to be answered by how aware are you of these items. Most of the answers were I the range of 1-7 with questions 2, 3, 4 having the least awareness

Email Comments

Several community members sent emails with suggestions for projects that were summarized in the CWPP projects section. The following is an example and summary of the email comments are a part of the records for the plan but have not been totally incorporated in the document.

Email from a Sierra City meeting from Sierra City Fire Chief Bryan Davies:

I recently met with a small group to work on getting some fuels reduction projects started in the Sierra City area, we would like to make sure the work are contemplating is captured in the CWPP the note below is a summary of our meeting, we are reviewing the plan to make sure the issues we have are captured in the new plan. Thanks for the great work. I've copied Sven Ostrom on the email as he is the person who has started this effort.

First, I would like to express my appreciation to everyone for sharing my concerns about the fire fuel problems that are threatening Sierra City. I was very pleased with the outcome of our meeting and the shared beliefs for the need to develop and implement a comprehensive plan that will reduce the fuels. From my notes, I came away with these areas of emphasis:

1. Reduce the fuels along the Pacific Crest Trail using the trail as access for a chipper.
2. Identify the public and private property along the Sierra Buttes road and research the possibility doing "spot" helicopter burning.
3. Develop water sources for "pumping" stations at Independence Ravine, The Columbo Mine, and the spring about one mile north of the four wheel drive look out road.
4. Remove the brush with a "cat" that is south east of the four wheel drive look out road to create a fire break between the south and north sides of the Sierra Buttes. There are other smaller areas further up the lookout road that may also be accessible for a cat.
5. Expand the cleared area north of the Kentucky Mine Museum once the private property boundaries are determined.
6. Work with Cal Trans to clear some of the larger trees that may be on their right of way since they have an interest to do so already.
7. Work with Cal Fire Representatives, local property owners and the private logging industry to implement a plan to reduce the overgrowth of Cedar Trees above Sierra City.

Please add any points of emphasis that I have missed or others that you have thought of since our meeting.

I will be contacting a Cal Fire Forester and Paul Violet from Soper-Wheeler and invite them to attend our next meeting on July 29th at 11:00.

Bryan

530-289-3201

Appendix E: Fire Protection District Structure Protection Preplan
Sample

Address: _____

Contact Person: _____

Phone Number: _____

Emergency Phone Number: _____

Property Location: _____

Fire Truck Turn Around: Yes ☐ ☐

Home is: Wood siding Brick Stucco Log

Single Level Two Story Tri Level

Home has: _____' Clearance Poorly Maintained Clearance No Clearance

Well Pond Swimming Pool Stream Water Tank

Other Source of Water -- Identify_____

Metal Roof Wood Shake Roof Composition Roof

Tile Roof Synthetic Roof

Access Road is: Graveled Dirt Asphalt - Good repair Poor condition

Overgrown with vegetation Accessible for fire trucks

One way in and one way out Two Ways in and out

Bridge ---- Concrete Wood

Driveway is: Graveled Dirt Asphalt --- Good repair Poor condition

Overgrown with vegetation Accessible for fire trucks

One way in and one way out Two Ways in and out

Terrain is: Level Slightly Sloped Rolling Steep

This simple preplan can be used by the fire districts to identify problem areas in there district and further assist them in developing pre-suppression plans

Attachments

Found on CWPP document CD

1. CAL FIRE CPRC 4291 Standards
2. CAL FIRE LE100
3. CAL FIRE Summary of Homeowners Fire Prevention Laws
4. CAL FIRE Nevada Yuba Placer Fire Plan and update
5. Sierra County 2002 Community Fire Safe Plan
6. Decision Memo for HWY 49 Roadside Hazard Reduction
7. Evacuation Planning
8. Title 14
9. Homeowners Summary of Fire Laws
10. Sierra County Fire Safe and Watershed Council Projects
11. Map Book all maps 11x17