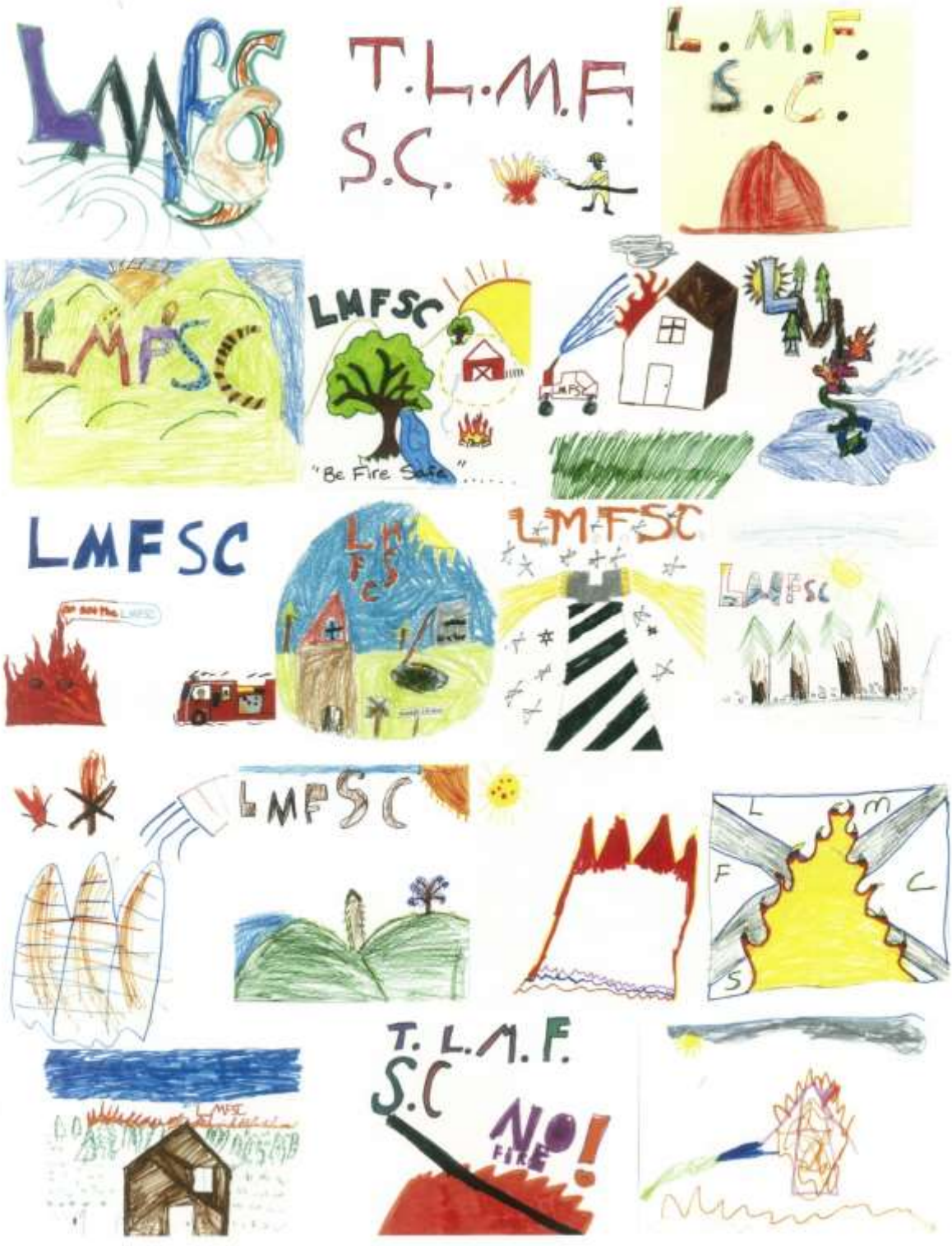
2016 Lower Mattole Community Wildfire Protection Plan

An update to the Lower Mattole Fire Plan, 2002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NO!
FIRE

Dedicated to JJ Hall (1947 – 2008)

Founding member of the Lower Mattole Fire Safe Council

and extraordinary community leader.

This plan has been put forth by the Lower Mattole Fire-Safe Council on behalf of the communities in the lower Mattole River watershed. To contact the Lower Mattole Fire-Safe Council, write them at:

POB 160, Petrolia, CA 95558, or *mrc@mattole.org*

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LMCWPP Acronym List

BLM: Bureau of Land Management

CAL FIRE: California Department of Forestry and Fire Protection

CWPP: Community Wildfire Protection Plan

Dbh: diameter at breast height

FLASH: Fire-adapted Landscapes and Safe Homes

HFRA: Healthy Forest Restoration Act

HVFC: Honeydew Volunteer Fire Company

KRNCA: King Range National Conservation Area

LMFSC: Lower Mattole Fire Safe Council

MRC: Mattole Restoration Council

MVCC: Mattole Valley Community Center

NEST: Neighborhood Emergency Services Teams

NFPA: National Fire Protection Association

NCUAQMD: North Coast Unified Air Quality Management District

OES: Office of Emergency Services/Office of Emergency Management

PTEIR: Program Timberland Environmental Impact Report

PVFD: Petrolia Volunteer Fire Department

SOD/SODS: Sudden Oak Death/Sudden Oak Death Syndrome

USDA: United States Department of Agriculture

WUI: Wildland-Urban Interface

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INTRODUCTION

The Lower Mattole Valley has evolved throughout time with fire, and fire will continue to shape it. Local residents have been working towards fire safety for many years, and they understand that it is not a question of if, but rather when, a fire will occur. How we prepare our homes, homesteads, neighborhoods, and communities for fire will determine how well we can coexist with it, instead of simply reacting to it.

WHAT IS A CWPP?

The California Fire Alliance[1] encourages the development of Community Wildfire Protection Plans (CWPP), as defined by the Healthy Forests Restoration Act (HFRA). This plan was developed using the Preparing a Wildfire Protection Plan*: A Handbook for Wildland Urban Interface Communities*.[2]

The CWPP enables a community to plan how it will reduce the risk of wildfire. The plan identifies strategic sites and methods for fuel reduction projects across the landscape and jurisdictional boundaries. Benefits of having a CWPP include National Fire Plan funding priority for projects identified in a CWPP. The Bureau of Land Management can expedite the implementation of fuel treatments identified in a CWPP, through alternative environmental compliance options offered under the HFRA.

Requirements for a CWPP

The National Fire Plan directed federal agencies to "work directly with communities to ensure adequate protection from wildfires, and to develop a collaborative effort to attain the desired future condition of the land."[3] The key wildland fire management agencies in California have chosen to accomplish this effort through the California Fire Alliance (The Alliance). To this end, the Alliance, on its website, encourages the development of Community Wildfire Protection

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1 California Fire Alliance. 2012. http://www.cafirealliance.org

2 Society of American Foresters. Preparing a Wildfire Protection Plan*: A Handbook for Wildland Urban Interface Communities. 2004.* http://www.healthyforest.info/cwpp/handbook.pdf.

3 California Fire Alliance. 2012. http://www.cafirealliance.org/organization_history/

Plans (CWPP), as defined by the HFRA.[4] A ''community wildfire protection plan'', as defined by the HFRA, means a plan for an at-risk community that fulfills the following criteria:

Collaboration

A. The plan was developed within the context of the collaborative agreements and the guidance established by the Wildland Fire Leadership Council and agreed to by the applicable local government, local fire department, and state agency responsible for forest management, in consultation with interested parties and the federal land management agencies managing land in the vicinity of the at-risk community.

This plan was collaboratively developed. Efforts were made throughout the planning process to collaborate with local, state, and federal land and fire management agencies. Leadership and guidance was provided by Humboldt County Community Development Services. Officials from CAL-FIRE, BLM, State Parks, as well as the Lower Mattole Fire Safe Council and the Mattole Restoration Council were involved in the Plan. In addition, special efforts were made to gain experience and insight from local community members through a series of meetings held between 2009 and 2015.

Prioritized Fuel Reduction

B. The plan identifies and prioritizes areas for hazardous fuel reduction treatments and recommends the types and methods of treatment on lands to protect at-risk communities and essential infrastructure.

This plan identifies areas for hazardous fuel reduction treatments as well as other recommended community projects, and prioritizes them using a ranking system. This plan also recommends the types and methods of treatment to reduce the risk of wildfire to communities and resources within the planning area.

Treatment of Structural Ignitability

C. The plan recommends measures to reduce structural ignitability throughout the at-risk community.

This plan recommends measures to reduce the ignitability of structures throughout the planning area. These recommendations can be found in the Community Assessment and Action Plan sections. In addition, the community meetings conducted during the development of the plan served as an important place to educate the public about reducing fire risks to the structures and community.

[4] California Fire Alliance. 2012. http://www.cafirealliance.org/cwpp.php

The *Lower Mattole Community Wildfire Protection Plan (LMCWPP)* is intended to provide vision, resources, and tools to help the communities in the lower Mattole watershed meet the following goals:

LOWER MATTOLE CWPP GOALS

1. To improve community awareness of fire safe land management practices and stewardship, and foster a respect for fire dependent ecosystems and the processes that maintain them.

2. To develop and adapt an array of strategies for fuel reduction and fire management that residents, agencies, and local organizations can work with.

3. To further develop the emergency communication and response system for residents, fire departments, and Office of Emergency Services (OES) representatives.

4. To support activities that restore fire-adaptive species in the ecosystem and to work towards a more fire-resilient landscape.

5. To identify possible future projects and funding sources that meet one or more of the goals.

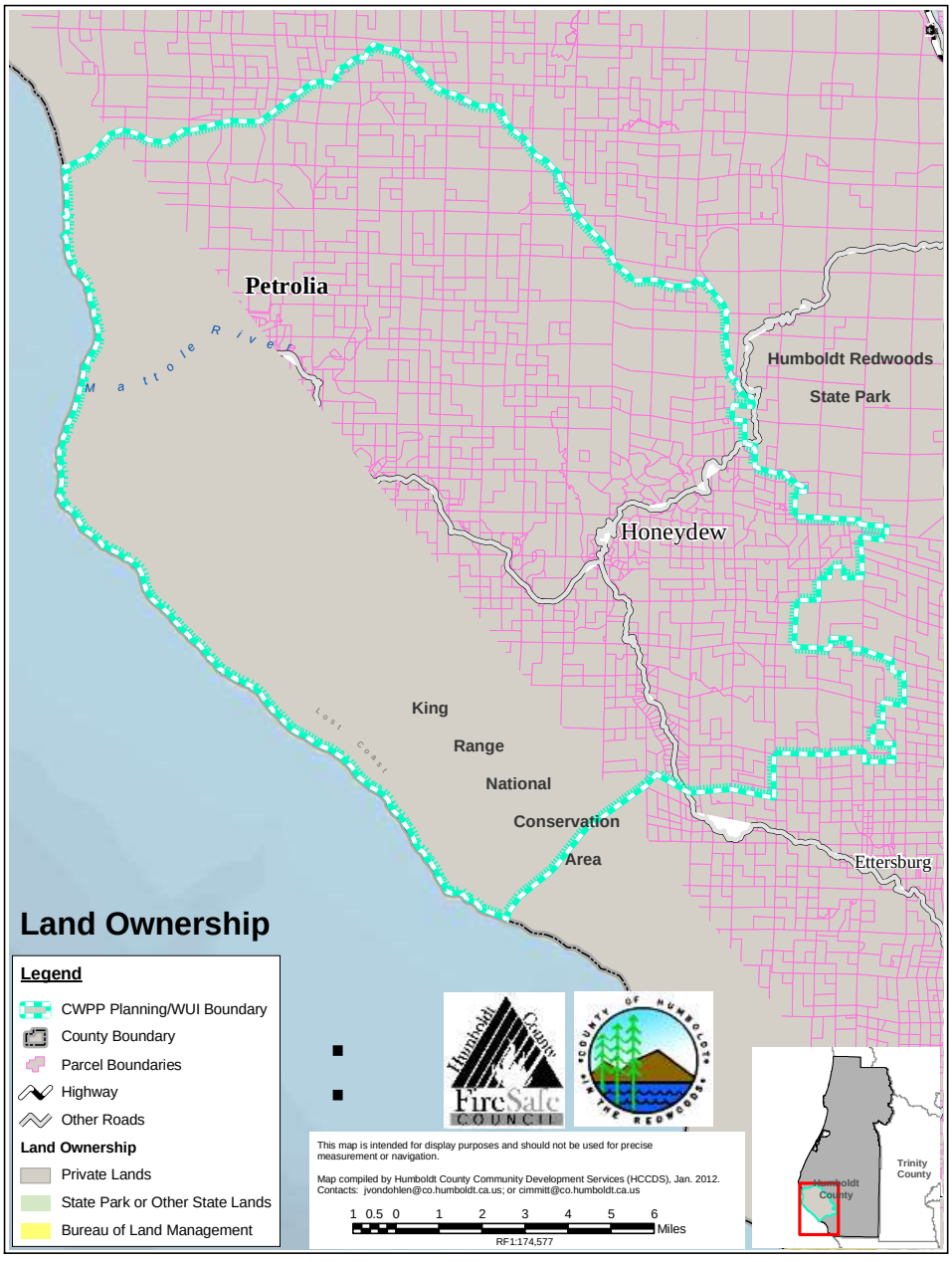
6. To serve as a tool for making progress on these goals over the next 10 years.

Look for this box placed throughout the CWPP for helpful tips.

Lower Mattole CWPP Planning Area

The Lower Mattole CWPP includes the Lower Mattole watershed from just North of Ettersburg to Petrolia, Prosper Ridge, some private in-holdings in the BLM King Range and Lost Coast Wilderness areas, and properties that border the King Range and State Park areas.

Figure 1: Land Ownership and CWPP Area Map



CWPP Planning Process

2002 Lower Mattole CWPP and Evaluation

The September 2002 Lower Mattole Fire Plan was the first fire plan in Humboldt County. It brought the community together around issues of fire for the first time in an organized way. The Lower Mattole Fire Safe Council (LMFSC) developed out of this process. Many of the projects outlined in the original plan have been completed, and some of the priorities of the plan have been met. The original plan has been evaluated by the LMFSC, and this current plan has been updated and expanded based on that evaluation.

Prioritized issues from the previous CWPP were grouped into four categories: water supply, fuel reduction, education, and agency cooperation.[5] These issues have been re-categorized into six priorities: Empowering Residents, Reducing Structural Ignitability, Reducing Fuels, Enhancing Fire Protection, Community Emergency Preparedness and Planning, and Fire Ecology and Conservation/Restoration.

The original Lower Mattole Fire Plan set forth a wide range of tasks and projects. Many of these projects have been completed, and many more are on their way to completion, while others have yet to be planned for, and some have not been able to happen. Some of the first shaded fuel breaks completed could use follow up treatments. More outreach and education is needed on the issues of restoring fire to the local ecosystem, and many residents and landowners are still in need of assistance with fire safing projects. It is important to evaluate the methods used for fuel reduction, ecosystem restoration, and fire safing, and adapt them as necessary.

Moving Forward

Based on recent census data, it is apparent that the Lower Mattole area has experienced some population growth over the last 10 years.[6] It may be the largest incremental growth yet recorded in the area. In 2011, the entire Lower Mattole area was designated as Wildland-Urban Interface (WUI) by the LMFSC. Based on this, it has been determined that the number of people living in the WUI zone is increasing at an accelerated rate. Reaching out to the expanding community on issues of living within a WUI zone is more important than ever, and managing wildland areas is also an increased priority.

Many shaded fuel breaks have been created in the Lower Mattole and many landowners have made progress on reducing fuel loads on their property. These efforts have mainly focused on keeping an intense fire out, and less about restoring fire to the surrounding ecosystem. These

[5] Lower Mattole Fire Safe Council. “Lower Mattole Fire Plan” September 2002. http://www.mattolefsc.org/

[6] 2010 Census Demographic Profiles. 2011. http://2010.census.gov/2010census/popmap/

projects are labor intensive and expensive to carry out, even while using burn piles to process the cleared slash. Using fire as a tool to maintain these areas has not been a priority in the recent past. In the face of an ever-increasing risk of WUI fires and less funding available, using fire as a tool to maintain these landscapes and to restore the local fire-adapted ecosystems may be a wise choice. In a 2008 paper by Alison Berry, the conundrum of not using fire to manage for fire is clearly pointed out:

> *Fuels reduction, either by prescribed burning or mechanical removal of fuels, can address the fire problem before the sparks fly. Currently, federal agencies treat about 2.5 million acres for fuels reduction annually. Some estimate that at this rate, it will take more than 70 years to address all acres in need of treatment (on US Forest Service Land)(Power 2006, 211). Before the task could be completed, the first areas treated would again be at risk. Estimated costs vary, but even conservative approximations run into the hundreds of billions of dollars (Power 2006, 213).*[7]

Fuels reduction, and fire safing tasks are an ongoing project for everyone. Even the most diligent landowner will find that there is always something more to be done. For this reason it is important to keep information and resources available to local residents and landowners, and not wait for the next catastrophic fire to motivate the community to take action.

Local emergency communication needs to be evaluated and better integrated. For instance, the neighborhood emergency service teams (NEST) list came out of the need for emergency communication after the earthquake of 1992. Linking this communication resource with local OES representatives and the local fire departments is the next step in emergency communication in the Lower Mattole. It is also imperative for the NEST list to be further integrated into the towns of Honeydew and Ettersburg.

Updating and reviewing the CWPP in the future is going to be an important step in determining how effective the projects have been and if the goals set forth are being met. The need for an evaluation process is apparent, and follow up on fuels reduction projects and fire safing strategies is an important step in progressing towards the CWPP goals. In order to understand if the methods used for fuels reduction and fire safing have been effective, the work completed up to this point needs to be evaluated, and the methods should be adapted.

[7] Allison Berry, "*Forest Policy Up in Smoke: Fire Suppression in the United States*," (Bozeman, Mt: Property and Environmental Research Center, 2008)

Community Meetings and Events

Community meetings were held throughout the planning process and all ideas and suggestions from these meetings have been incorporated into this CWPP. In total, over 230 people attended these community meetings and events and 23 specific projects were proposed. Out of an analysis of these specific projects, many other projects have been identified as appropriate. All of these projects have been included in the 2016 ACTION PLAN PROJECT TABLES section, on page 71. Community priorities centered around the following topics: fire safety assessments, emergency communication, fuel breaks, fuel reduction, and fire water storage.

In addition to the meetings and events listed in Figure 2 below, a number of meetings have been facilitated by the LMFSC with the Petrolia Volunteer Fire Department (PVFD), Honeydew Volunteer Fire Company (HVFC), Bureau of Land Management (BLM), and the County of Humboldt throughout 2011 and into 2012 along with regular meetings of the LMFSC into 2015. Other meetings not listed here include those that were facilitated in local neighborhoods in 2009, including Cooskie, New Jerusalem and Windy Nip neighborhoods.

Figure 2: Table of Community Meetings

Location of Meeting	Year	# People
Chambers Neighborhood	2009	14
Conklin Neighborhood	2009	10
Flat Neighborhood	2009	14
Lighthouse Neighborhood	2009	16
Honeydew Firewise Event	2011	About 30
Petrolia Firewise Event	2011	About 120
Lower Mattole CWPP Public Meeting	2012	43
Lower Mattole FSC Meetings	2013 -15	10-15 each

Collaborating Organizations and Agencies

Lower Mattole Fire Safe Council

The Lower Mattole Fire-Safe Council was founded in 2002 to reduce risks and minimize damage to life, property, and the environment from wildfire, by coordinating efforts to fund and implement fire-safe education and projects in the Lower Mattole.

The goals and objectives of the LMFSC are:

1. Reduce fuel load in and around our neighborhoods, thus reducing the danger to life, property, and the environment.
2. Increase availability of water resources for wildland firefighting by strategic placement of water tanks and ponds.
3. Assist local firefighting agencies in creating, maintaining, and distributing a Firefighter's Information Atlas.
4. Promote healthy forest and rangeland ecosystems by reduction of hazardous fuels.
5. Promote creation of shaded fuel breaks in appropriate locations.
6. Educate and assist private landowners in prioritizing and implementing fire-safe practices.
7. Enhance communication between our community and firefighting agencies.
8. Implement the Lower Mattole Fire Plan with ongoing monitoring and evaluation.
9. Assist those in the community who need help fire safing their homes and property.

Current Lower Mattole Fire-Safe Council Representatives:

- Bureau of Land Management (BLM): Tim Jones, Fire Management Officer
- CAL FIRE: Chris Ramey
- Conklin Creek-Ben Brown
- Green Fir/New Jerusalem: Josh Free
- Honeydew Volunteer Fire Company and Resort area: Ian Sigman (Chair)
- Humboldt Redwoods State Park (HRSP): Allan Wiegman, Resource Ranger
- Lighthouse Road: Recently vacant
- Petrolia Volunteer Fire Department (PVFD): John Summers and Sam Epperson
- Windy Nip/Doreen Drive: Pete Marshall
- Mattole Restoration Council: Ali Freedlund
- Panther Gap: Gail Samuels
- Petrolia Downtown: Mary Day
- The Flat, Petrolia: Chris Gilda/Kathy Radke (NEST coordinator)
- Prosper Ridge: Ali Freedlund
- Wilder Ridge: Claire Trower

The LMFSC is currently working on recruiting more representatives. Many neighborhoods are without representation at this time. Neighborhood representatives are responsible for attending meetings twice a year, reporting on their current neighborhood fire safety issues, and helping facilitate outreach and assistance to their neighborhood. See below for a list of areas without representation at this time. To join, contact the LMFSC by calling 707-629-3514 or by e-mail at mrc@mattole.org.

Would you like to get involved with the Lower Mattole Fire Safe Council?
Call: 707-629-3514
E-mail: mrc@mattole.org

Current Vacancies in the LMFSC Assesment Area**:**

- Lower North Fork
- Honeydew

Other neighborhood areas in high density that could use representatives and are on NEST (Neighborhood Emergency Service Team) list

- Chambers Road
- Hideaway
- Evergreen Way
- Matthews Ranch Road
- A-Way
- Mid Valley
- Old Hindley
- Lighthouse Road

Petrolia Volunteer Fire Department

The Petrolia Fire Protection District (FPD) was formed in 1951 as an independent single purpose special district authorized to provide fire protection, rescue, emergency medical services, and any other services relating to the protection of lives and property. The majority of the calls for service are medical calls. The District has a three-member Board of Directors that is elected by registered voters who live within the district. The PVFD is responsible for providing fire protection services to the town of Petrolia and the surrounding area. The fire department has three fire engines: one Type 1 and two Type 3s. The Type 1 is a pavement queen structure engine with a very large capacity pump, hose and tank. The two Type 3s are what is used most often. The department also has a Type 6 quick attack vehicle. Firefighters often respond to areas outside of the District's designated boundary. The delivery of fire protection services outside of district boundaries is often referred to as "goodwill service" because there is no local agency responsible for providing the service and the District fire department provides the service out of goodwill rather than obligation.

Honeydew Volunteer Fire Company

The Honeydew Volunteer Fire Company (HVFC) was formed in 1987, and serves a response area of nearly 100 square miles. The HVFC operates four wildland "quick attack" engines, and one water tender, from four stations. The HVFC has no formal district boundaries, and their income from the community is by voluntary contribution. The response area is rugged and isolated, presenting challenges for wildland and structure firefighting, as well as emergency medical, and rescue services. Because the HVFC is not a fire district residents pay more for the State Responsibility Area fire fee than residents in a recognized fire district such as Petrolia.

Mattole Restoration Council

The Mattole Restoration Council's (MRC) primary mission is to understand, restore and conserve the ecosystems of the Mattole River watershed. It is a non-profit organization that works to restore health and vitality to all communities in the watershed including the human ones. The MRC has been partnering with the LMFSC since 2002 on fuels reduction and fire safety projects.

The County of Humboldt and Humboldt Fire Safe Council

The Humboldt County Board of Supervisors appoints members to a collaborative countywide Fire Safe Council. The purpose of the Humboldt County Fire Safe Council is to oversee the maintenance and implementation of the Humboldt County Master Fire Protection Plan (MFPP), Humboldt County's equivalent to a CWPP. When appropriate, the Council informs and makes recommendations to the Board of Supervisors.

The Council encourages the development of local fire safe councils with broad voluntary participation that includes collaboration with private landowners, and public agencies. The Council also evaluates projects that are eligible for funding under Title III of the Secure Rural Schools, and Community Self-Determination Act, to assist communities with the development of CWPPs and Firewise activities.

California State Parks

California Department of Parks and Recreation manages more than 270 park units. Humboldt Redwoods State Park encompasses nearly 53,000 acres, over 17,000 of which are untouched old-growth coastal redwoods. Created in 1921 with the small Bolling Memorial Grove, the park has grown over the years to include a diverse ecosystem that encompasses the entire Bull Creek watershed and the Rockefeller Forest, the largest remaining old-growth redwood forest in the world. This is the third largest California State Park and protects an environment unique to anywhere else on earth.

A small portion of Humboldt Redwoods State Park (HRSP) spills over the ridge into the Mattole watershed. The Park has been actively implementing fuel reduction projects near this ridge.

From a wildfire perspective, it is important to realize that landowners and managers in the Mattole are co-managing alongside CA State Parks. In 2014, the MRC collaborated with Parks and CAL FIRE to upgrade and staff the Grasshopper Fire Lookout facility within the HRSP.

Bureau of Land Management

Bureau of Land Management (BLM) land within and around the Mattole CWPP planning area is managed out of the BLM Arcata Field Office. The Arcata Field Office is responsible for the administration of natural resources, lands, and mineral programs on approximately 220,000 acres of public land in northwestern California. The area includes the 70,000-acre King Range National Conservation Area (KRNCA). The KRNCA, the most prominent of BLM landholdings within the CWPP planning area, is along 35 miles of coastline between the mouth of the Mattole River and Sinkyone Wilderness State Park. According to the 2004 KRNCA Resource Management Plan and Final Environmental Impact Statement, "past fires have been instrumental in shaping the current vegetative patterns and fuel conditions on the KRNCA. Fire will continue to be a key element of vegetative conditions in the area, particularly for maintaining or improving grasslands, chaparral, and other fire-adapted communities. Despite these beneficial aspects, fire—particularly very hot and intense fires—can also be a negative force, posing a serious threat to the human improvements, visual opportunities, wildlife, and vegetative communities existing throughout the area."[8] The BLM is the responsible agency for fire protection in the KRNCA but has cooperative agreements with other agencies such as CAL FIRE. The BLM has an engine at the King Range Fire Station located just west of Thorn Junction. Pre-fire management efforts have been undertaken, and there has been a gradual increase in the development of a fuels management program, such as the 27-mile long shaded fuel break developed and maintained by BLM to reduce fuels at ridge tops and roads which are critical to fire suppression capacity. Other efforts have been made in coastal prairie grassland areas to reduce Douglas-fir and brush encroachment.

CAL FIRE

The California Department of Forestry and Fire Protection (CAL FIRE) is dedicated to the fire protection and stewardship of over 31 million acres of California's privately-owned wildlands. In addition, CAL FIRE provides varied emergency services throughout the state. CAL FIRE is always ready to respond to medical aids; hazardous material spills; swift water rescues; search and rescue missions; civil disturbances; train wrecks; floods, earthquakes, and more. CAL FIRE maintains a significant presence in Humboldt County in both fire protection and resource management. CAL FIRE provides dispatching services for the Humboldt Dispatch Cooperative at the Fortuna Interagency Command Center. The Cooperative includes participation from the

[8] Bureau of Land Management. "King Range National Conservation Area Draft Resource Management Plan and Draft Environmental Impact Statement." (Arcata, Calif.:U.S. Dept. of the Interior, Bureau of Land Management, Arcata Field Office,[2004]).

majority of the local fire departments including Petrolia and Honeydew. CAL FIRE maintains a seasonal fire station in Honeydew where a trained crew is stationed and ready to respond to local wildfires and other emergencies.

Public Review Process and Input

The Public Draft of the CWPP was available for comment from February 23 through March 25 2012 and by notice through LMFSC meetings through 2015. Notices were posted at the Petrolia and Honeydew Stores with a copy available at each location, as well as online. Public announcements on the radio were also incorporated throughout the time span. A public meeting was held to review the CWPP, answer questions, gather comments, and go over projects and maps with the community. All public comments have been incorporated as much as possible.

Lower Mattole Fire Safe Council Meeting, Honeydew 2014

Fire Ecology : The Big Picture

Evolving with Fire

Many residents of the Lower Mattole Valley understand that it is not a question of *if* a wildfire will occur here, but rather a question of *when.* The Lower Mattole is a place that has evolved with fire, including local species like Douglas-fir and native bunch grasses.

The ecosystems and landscapes in the Mattole have formed and adapted with natural disturbances. Throughout history people in the Mattole have lived with fire and experienced the power of fire as a tool, disturbance, tragedy, and blessing.

Fire is like a houseguest you could be expecting at any moment.

How are you going to host the next wildfire that passes through your neighborhood?

"Since the dawn of time, fires have burned regularly, consuming vegetation, accumulations of insects and diseases, and triggering a rebirth of forests. Without periodic fire, plants and animals requiring nutrients and vegetation from other parts of the cycle disappear. Fire, in places where it is a crucial part of the ecosystem, promotes vegetative and wildlife diversity, helps maintain wilderness and wildland areas, and eliminates the heavy fuel accumulations which can ultimately lead to catastrophic wildfire. Many plants have evolved adaptations that protect them as a species against the effects of wildland fire, and some are even strengthened by it. Nearly every ecosystem in the country has some kind of fire dependent plant or tree."[9]

Wildland fire is part of the natural ecological process. To balance potential risks and benefits, it is important to understand the impact fire can have on everything from carbon emissions and sequestration to impacts on sensitive ecosystems. Fire can be valuable in reducing the build-up of fuel, replacing vegetation susceptible to insects and disease, and promoting native diversity.

Many organizations around the country are finding creative ways to re-integrate fire into the culture and into resource management practices. The Nature Conservancy has developed a process they are calling Integrated Fire Management that is experiencing success in many communities.

[9] Fire is Nature's Housekeeper. http://www.smokeybear.com/natural.asp

Fire's Role in the Ecosystem and as a Land Management Tool

Fire can be a very beneficial land management tool. CAL FIRE uses a 7 to 1 ratio to explain the benefits of firefighting costs and efforts when compared to fire prevention costs and efforts. Prescribed fire can be used to achieve many goals, including preventing catastrophic wildfire, reducing fire suppressions costs, and restoring forest and grassland health. Utilizing fire in this way requires maintaining a relationship with fire and the landscape. Stephen J. Pyne explains this relationship well in the following quote:

> *"Fire-as-tool suggests that the problem is to put fire in or take it out. The solution to unwanted fire is to shut off its air supply, remove its fuel, interrupt its chain of ignition. Fire-as-natural urges, if obliquely, that people erase themselves from their heritage as fire agents. By contrast, fire-as-biology suggests that the problem is to decide what fire's context should be, and then determine what kind of catalytic fire-induced jolt might best serve that setting. That fire is not merely a device to reduce fuel so much as combustibles are a means to get the kind of fire a biota requires.* ***That our role as fire-keeper is more complex than that of tool-maker because it involves ecological connections as well as tasks. That fire, for humanity, is more than a problem or a process: it is a relationship. That fire, although no longer considered an element, remains elemental."*** [10]

The benefits of fire seem to be becoming a part of common knowledge once again. However, we are still overcoming the previous decades of a fire suppression culture. Fire brings out very different and strong emotions and opinions. It is one of our greatest tools but also one of nature's most destructive forces. Fire has many benefits to the local fire-adapted ecosystems of the Lower Mattole, including nutrient cycling, providing habitat, killing disease and creating a diverse forest composition.[11] Fire is an important natural component of the local ecosystem, and contributes to the resiliency of the landscape. Resiliency is very important in the face of ever more threats to the landscape, including an increasing WUI zone and population, increasing wildfire threat due to ongoing drought, climate change, and new forest diseases and pathogens.

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[10] Stephen J. Pyne. "Fire Ecology: Issues, Management, Policy, and Opinions, A forum for the Association for Fire Ecology, The Element That Isn't" (School of Life Sciences P.O.B. 874701 Arizona State University, 2006) http://fireecology.net/docs/Journal/pdf/Volume02/Issue01/001.pdf

[11] www.fire.ca.gov

Fire History in the Lower Mattole

Fire is an integral part of landscape processes throughout California. Lightning storms can ignite wildfires and historically Indian tribes of California traditionally cared for their resources and the land by setting frequent small fires. In the Klamath region of northern California indigenous peoples burned a large amount of the landscape every 3-5 years. According to accounts of settlers in the 1800's, the indigenous people in the Mattole, including the Mattole, Sinkyone and Wailaki tribes, also used fire to care for the landscape.[12] The historic frequency of fire ignition by humans and lightning maintained an overall lighter fuel load, a more diverse plant assemblage and many open prairie ecosystems. Therefore, fires very rarely burned with the intensity and force to destroy an entire forest, as seen in some cases today.

One of the most important land management tools for native people of northern California was intentional burning. It was well understood that the intentional, low-intensity burns stimulated the native foliage, increased forage area for important game, and enhanced the overall quality of natural resources.

In addition to the indigenous use of fire, there was widespread intentional burning by early European settlers in the Mattole watershed. Between 1875 and 1897, fires were set to maintain grasslands for livestock grazing, enlarging pastures and clearing land. From 1880 to 1952 many large fires were documented in local newspapers. During this period, the landscape was also drastically altered by the *ad valorem tax* that charged landowners for their standing timber. This tax resulted in widespread logging throughout the valley. Fire continued to be frequent on the landscape until the mid-1940's when the California Department of Forestry began a heavy fire suppression campaign, following the lead of the US Forest Service nationwide fire suppression approach.[13] The unprecedented combination of widespread logging and heavy fire suppression resulted in the dense second-growth forests of Douglas-fir and tanoak that are found throughout the Lower Mattole today.

Interestingly, there are few untouched Douglas-fir stands in the Lower Mattole that are older than 350 years suggesting either wildfire or geologic activity that replaced forest stands prior to the ad valorem tax.

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[12] Roscoe, James (1985). An Ethnohistory of the Mattole. Humboldt State University. Arcata, CA.

[13] CAL FIRE. Humboldt-Del Norte Unit Fire Management Plan. 2011.

The era of fire suppression began as a protection against disturbance. Many ecologists, agencies, and local residents now recognize that fire is a necessary part of the functioning forest and grassland ecosystem types found in the Mattole. [14]

Historical Fire Return Intervals

According to fire modeling done by CAL FIRE, the return interval of fire to any given area in the Mattole is approximately 25 years.[15] However, the return interval probably varies significantly across the different ecosystems in the watershed. Extensive research has not been done on the historical return interval of fire in the Mattole. However, parallels can be drawn to research done in other coastal Douglas-fir dominated systems. A team of scientists in Point Reyes National Seashore examined charcoal layers in soil cores to find the historic fire regime. They paired this information with fire scars and found an average return interval of fire between 8 and 9 years.[16]

CURRENT AND FIRE MANAGEMENT BEHAVIOR

Today, fewer acres burn annually in the Mattole than what burned in the historical fire regime due to fire suppression efforts to safeguard homes. However, heavy fuel loads generated from

[14] Mattole Restoration Council. *State of the Mattole*, Series: Number 1 – Fire Monograph. 2009.

[15] Mattole Restoration Council. "Upper Mattole Fire Plan." 2004.

[16] Brown, Kaye, and Buckley."Fire History in Douglas-fir and Coast Redwood Forests at Point Reyes National Seashore, California." Northwest Science vol. 73, no. 3 (1999).

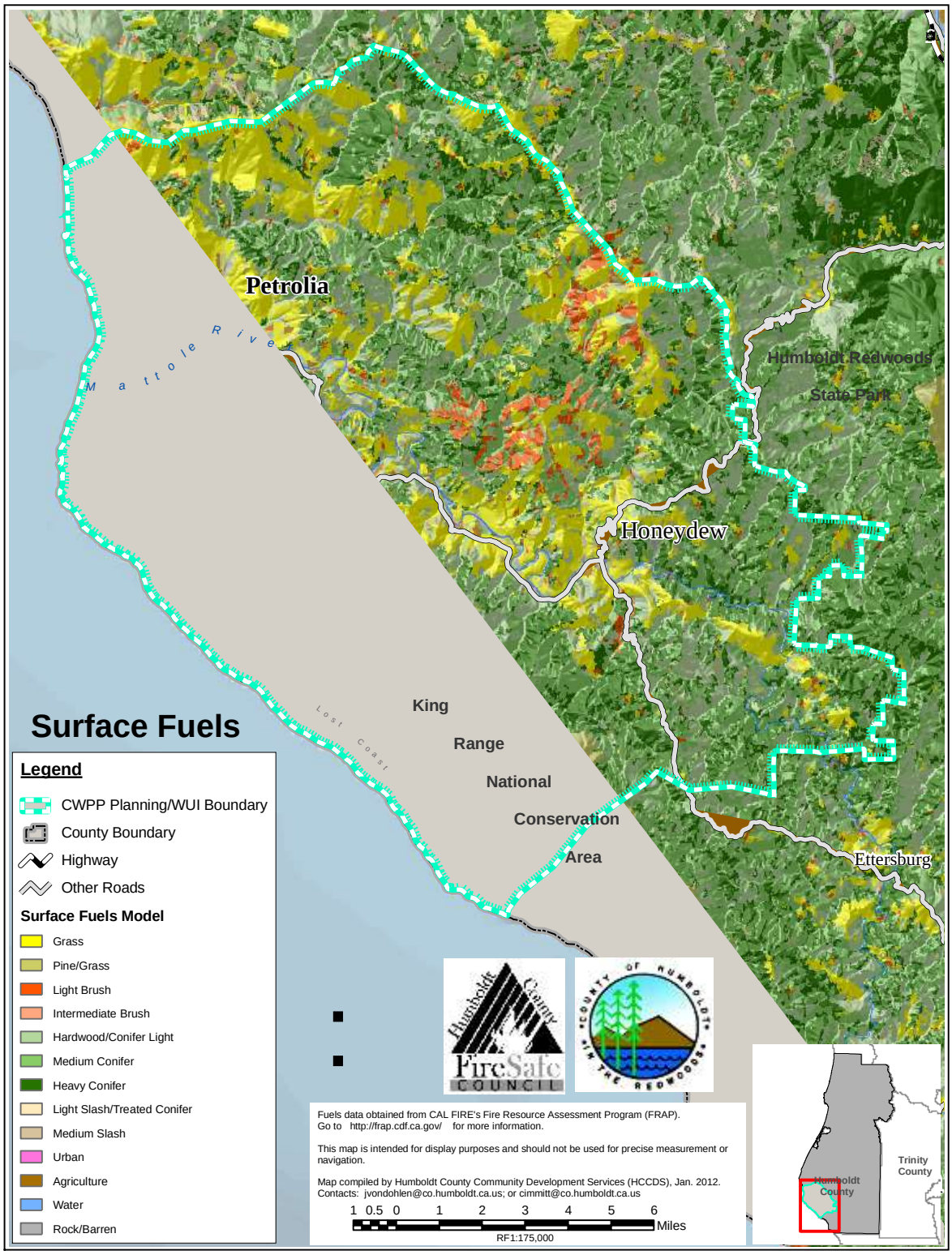
decades of fire suppression can encourage small fires that would otherwise burn through the understory to reach into the tree tops. Once a fire has spread from the ground into the canopy of one tree, prevailing winds can spread into surrounding trees becoming a crown fire. Crown fires can devastate swaths of forest.

The behavior of fire is dictated by three crucial components: weather, topography, and fuel load. Out of the three, fuel load is the only component that humans can significantly modify on a scale that will affect the behavior of wildfires. If the fuel load is reduced across a landscape, the intensity and spread of fire can be reduced as well.

Estimating the fuel load in the Mattole is a critical component to understanding how fire will interact on the landscape. Removing ladder fuels has been a goal of fuel treatments. Ladder fuels are typically low branches, shrubs or even an understory of trees that allow a fire to spread from the ground to the canopy of a forest. The extent of the fuel load can be estimated using CAL FIRE's surface fuel model. In the model, each surface fuel category describes the landscape with a set of vegetation types that exhibit certain burning characteristics (flame length, rate of spread, etc.) in a given severe weather condition. The map on the following page (Figure 3) shows surface fuels in the Mattole using data from the CAL FIRE Fire and Risk Assessment Model.[17]

[17] CAL FIRE. Fire and Resource Assessment Program [Metadata]. 2010. http://frap.fire.ca.gov/

Figure 3: Surface Fuels Map



Fuel Load

The previous map shows that the majority of fuels in the Lower Mattole are medium to heavy conifer cover. Most of the fuel reduction focus over the last ten years has been in Douglas-fir dominated forests. Currently many of these forests are still alarmingly overgrown and dense.

Climate

The Mattole basin has a Mediterranean climate characterized by cool, wet winters with high runoff, and dry, warm summers with greatly reduced flows. Most precipitation falls as rain. Along the coast, average air temperatures range from 46°F to 56°F. Further inland, annual air temperatures are much more varied, ranging from below freezing in winter to over 100°F in summer. The Mattole basin receives one of the highest annual amounts of rainfall in California, averaging 81 inches. Average rainfall near the coast in Petrolia is about 60 inches per year. Well over 100 inches per year falls near the center of the Basin in Honeydew. Extreme rain events do occur. For example, over 240 inches fell over parts of the basin during 1982-83. [18]

Before making plans to reduce fuels on your property, check out these fire behavior terms. Learning about fire behavior can help you start to create the conditions needed to help stem catastrophic fire on your property.

Fire Behavior Characteristics

Understanding fire behavior is important for understanding fire threats and creating management strategies. Fire behavior can vary greatly depending on the type of vegetation, fuel load, climate and topography. A **surface fire** primarily consumes ground-level fuels, advances quickly, burns less intensely, and responds to fire suppression well in the right conditions. A **crown fire** primarily burns the canopy of a forest and can spread quickly through dense stands and is difficult to suppress. **Fire intensity** refers to the amount of heat released from a fire in a given place over a specific time. **Fire severity** refers to the effects of fire, including soil damage and tree mortality. The **rate of spread** refers to how rapidly a fire can advance, which is especially important in planning for fire suppression. **Residence time** refers to how long a fire will burn in any one place, which is directly related to the type and amount of fuel present.

[18] coastalwatersheds.ca.gov

Current Local Fire Regime

The local fire regime has been dramatically altered in the past century. This is due to a number of factors, including destruction of indigenous management culture, suppression efforts, changes in stand composition, and changes in land use.

It is likely that indigenous peoples used fire, particularly to maintain grasslands and increase productivity of oak woodlands. While this has not been documented extensively in the Mattole specifically, it is well documented throughout the region. The arrival of Euro-American settlers was marked by the destruction of this culture.

Over the last century, suppression has ascended to be humans' main tool in managing wildfires. Monumental emergency response efforts have become increasingly costly and difficult over recent years. Fire suppression allows fuel loads to build, particularly undergrowth, which can act as ladder fuel and can inhibit fire-adapted ecosystems.

Much of the Mattole watershed was subject to intense and egregious timber harvest throughout the 20th century. Roaded forestland full of stumps was then subdivided and sold into smaller ownerships. This resulted in dramatically changed forest composition leaving non-industrial owners without the resources—and in some cases knowledge—needed to restore forest health. The result is high-density, young forests with much higher fuel loads than before.

Finally, as land was converted from use exclusively as resource land to mixed uses, including rural residential, the associated cost of wildfire increased. Rural residents in the Mattole are often challenged to effectively repair and manage their cutover land. Many landowners who bought industrial timber parcels planted non-native tree species like Ponderosa Pine.

All of these changes have worked together to alter the fire regime, resulting in smaller fires and longer return intervals, leaving the landscape with higher fuel loads and increased risk of catastrophic fire when it does come again.

Figure 4: Fire Regime Condition Class Map

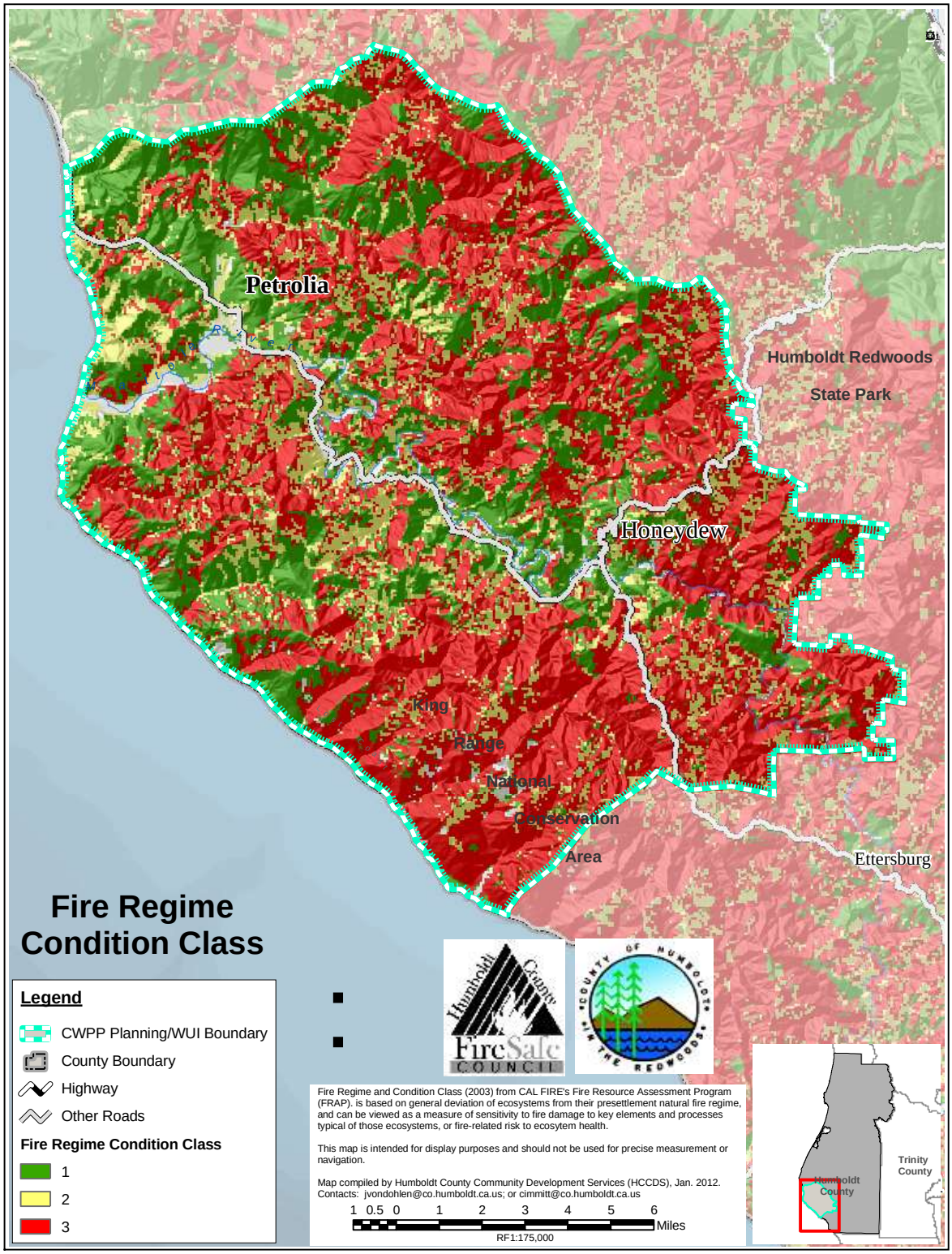


Figure 4: Fire Regime Condition Class Map, shown on the previous page, describes the degree to which the local fire regime has been altered. How much an ecosystem is altered, or out-of-balance from its natural fire regime is measured by "fire regime condition class" classifications.

• Condition Class 1 is associated with low-level disruption of fire regime (within or near historical range), and consequently low risk for loss or damage.

• Condition Class 2 indicates some degree of departure from natural regimes, with associated changes in ecosystem composition and structure that render future fires a likelihood of some loss and change in key ecosystem components.

• Condition Class 3 is highly divergent from natural regime conditions (significantly altered from historical range), and presents the highest level of risk of loss.

Over half of the planning area is classified as Condition Class 3, about one-third is Condition Class 2, and about 10% is Condition Class 1. This indicates that the majority of the area is out of balance and susceptible to losing key ecosystem components as well as human infrastructure.

This significant disruption in the natural fire regime contributes to changes in plant composition and structure, uncharacteristic fire behavior and other disturbance agents (pests), altered hydrologic processes, and increased smoke production.

Wildfire Environment of the Lower Mattole Watershed

The natural features of the environment in which a fire occurs directly influence fire behavior and fire ecology. The following sections describe the main environmental features, including the dominant vegetation types, in the Lower Mattole CWPP area.

The Mattole River and Watershed

The Mattole River watershed drains a remote 300-square mile portion of the coast ranges of Humboldt and Mendocino counties in northwest California. It historically supported abundant native salmon runs and extensive old-growth temperate rainforests of Douglas-fir and coast redwood. Due to extensive, unregulated clear-cut logging in 1950's and '60s, combined with extreme flood events and naturally steep and unstable terrain, the Mattole became polluted with excessive sediment and high temperatures. Salmon populations plummeted to the brink of extinction, and forests have grown back in dense thickets of brush and young trees creating extreme wildfire hazard. More recently, low in-stream flows have become a serious issue, particularly in the headwaters and during the ongoing drought. The Mattole enters the Pacific

Ocean about 10 miles south of Cape Mendocino, draining directly into a state designated Area of Special Biological Significance, Critical Coastal Area, and Marine Protected Area. [19]

Figure 5: Vegetation Composition in the Mattole[20]

Forest Type	Percent of Forest Cover	Percent of Watershed Cover
Redwood	3%	2%
Douglas-fir	61%	52%
Hardwood Conifer	16%	13%
Hardwood	19%	16%
Annual Grasslands	N/A	16%

Grasslands

Healthy and intact native grasslands may be an important element in the face of climate change. Native perennial grasses often remain green longer throughout the summer dry season than annual grasses, providing forage for wildlife throughout the year while lessening the fire danger. Additionally, well-managed grassland with low levels of thatch could serve as a fire break during forest fires.

By gathering and propagating native grass seed, prescribing fire where appropriate, reducing the encroachment of Douglas-fir and coyote brush, and replanting with native grasses, the spatial decline of grasslands can be prevented while improving species diversity.

"In the absence of disturbances, such as fire and grazing, a thick layer of plant litter accumulates in grasslands and can reduce species diversity through shading, physically

[19] Mattole Restoration Council. "Mattole Integrated Coastal Watershed Management Plan." August 31, 2009. http://www.mattole.org/plan.

[20] California Department of Forestry. 1998. CalVEG GIS Layer. Mattole Restoration Council GIS

interfering with plant growth, alteration of germination cues, providing shelter for invertebrate herbivores and seed predators and encouraging pathogens."[21]

"Many rare plants found in grasslands depend on fire to stimulate germination and to create openings in the existing vegetation. These plants, usually forbs, are called 'fire followers' or 'fire annuals' because they germinate in abundance from soil-stored seeds in the burned areas after a fire, but are seldom seen in unburned areas."[22]

Many grasslands have been encroached by thick stands of Douglas-fir. Removing the young trees along with prescribed burning can help manage and restore grasslands for native diversity while meeting fuel reduction and WUI treatment goals. Collaboration between the BLM, PVFD, HVFC, LMFSC, and the MRC is ongoing with this goal in mind. By 2016, two projects treated 100 acres of privately-owned ridgeline prairies by removing young firs and brush. Since 2014 an ongoing project with BLM and MRC has been treating the publicly-owned Prosper Prairie with a variety of treatment strategies.

Coastal Scrub

Brush species mix into grasslands and forestlands within the Lower Mattole area. These areas are especially susceptible to fire, and contribute to ladder fuels. Currently there is no special management strategy to address native coastal scrub and brush habitats. However, there is an ongoing effort to control invasive scotch broom though the MRC's Invasive Plant and Fire-adapted Landscapes and Safe Homes (FLASH) programs.

Forests

The hardwood and coniferous forests of the Mattole River watershed are a cultural, ecological, subsistence and commercial livelihood resource. Over recent decades, the health, productivity, and resiliency of Mattole forests have been endangered by fire hazard and fuel loads. Today the majority of the forest cover in the Lower Mattole is comprised of young, even-aged second-growth conifers and hardwoods, predominantly Douglas-fir and Tan Oak.

[21] http://www.sonoma.edu/preserves/prairie/management/

[22] http://www.sonoma.edu/preserves/prairie/ecology/fire.shtml

Old-Growth Douglas-fir trees have a thick crenulated bark that protects them from most fires, whereas, young fir are like little torches full of fuel. By 1988, there remained less than 10% of the original old-growth forests in the watershed. Presently, most second-growth forests include heavy fuels that need management to help rebuild the vigor the forests will need to withstand impacts from wildfire and drought.

Based on an analysis of satellite imagery, half of the watershed's forests are believed to have an average size of 12-24 inches diameter at breast height (dbh). Twenty percent of the area is covered by stands that average greater than 24-inch dbh trees, and another 11% is covered by pole-sized trees 6-11 inches dbh.[23] Forest structural attributes, seral (i.e., age) stages, and mix of species on the forestlands are determined by a combination of physical, biological, and disturbance factors. Physical factors include soil, moisture, temperature, and topography. The Mattole basin is unusual within the northern California coast as having very little redwood forest. Forestlands are in need of the most management, and hence are the focus of many fuel hazard reduction projects. Surface fuel categories are based on a set of vegetation types that exhibit certain burning characteristics (flame length, rate of spread etc.) in a given weather condition. Medium to heavy conifer cover is the dominant vegetation and surface fuel category across the Mattole watershed.

Wildlife and Sensitive Species

The Lower Mattole is home to abundant wildlife species. There are three federally listed anadromous fish: steelhead, Chinook salmon, and coho salmon. **For a complete list of all the listed species in the Mattole, see Appendix D**

Many of the sensitive and listed species would benefit from an increase in late seral habitat, such as the marten, fisher, and northern spotted owl. Another benefit of managing lower Mattole forestlands for lighter fuels is to speed the recovery of late seral habitats.

Wildfire Risk

Most of the lower Mattole planning area is considered to be high or very high fire hazard. This means the risk of high intensity fires and fires with rapid rates of spread are likely. Accordingly,

[23] Downie, S. T., C.W. Davenport, E. Dudik, F. Yee, and J. Clements (2003). Mattole River Watershed Assessment Report. North Coast Watershed Assessment Program, California Resources Agency, and California Environmental Protection Agency, Sacramento, California.

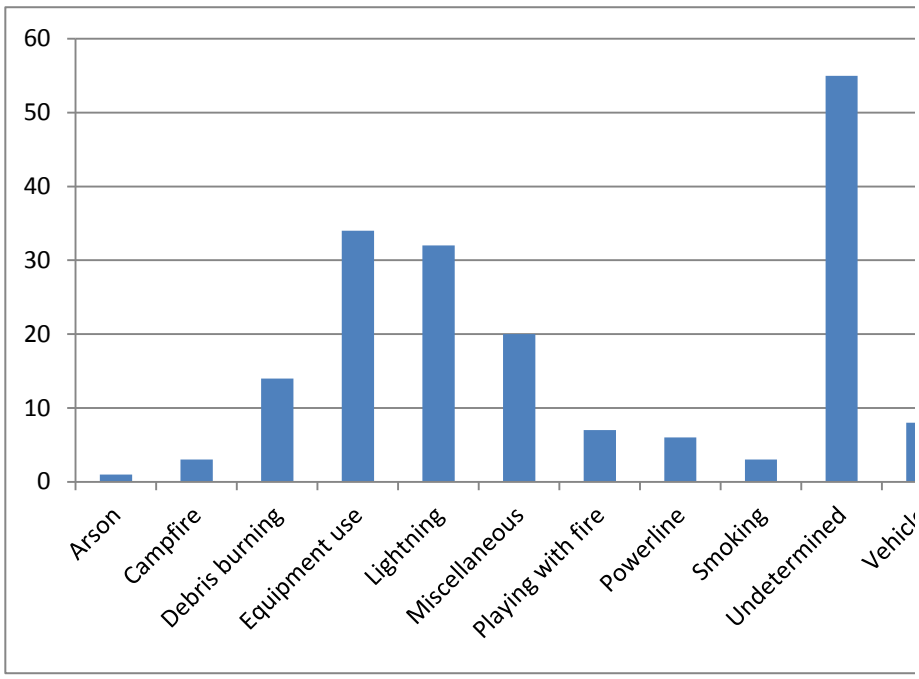
preparedness becomes very important as suppression efforts will often be challenged, particularly on south slopes and in times of severe fire weather. High to Very High fire hazard severity zones dominate the Mattole watershed in this FRAP modeling map, determined by combining data on Fuel Rank and Fire Rotation.

Figure 6: Fire Hazard Severity Zone Map

Fire Starts

Fire starts are recorded by CAL FIRE for each known fire. The following graph shows the number of fire starts recorded in each category from 2002 through 2009 in the Humboldt-Del Norte Unit. The undetermined category contains the most starts of any category. The runner up is the human-caused category of equipment use.

Figure 7: Table Of Fire Starts By Category



The map on the following page depicts the location of all recorded fire starts from 2007 to 2010. Fire starts are generally clustered around population centers or along frequently traveled roads.

It can be concluded from this chart and map that influencing human behavior will be a critical component of increasing fire safety. In addition, the map indicates that fires often ignite in populated areas. This has two implications for response efforts: first, firefighters will often not have time to respond to fires as they ignite close to residents and other community infrastructure; second, fire often ignites in populated areas and spreads to wilderness.

Fire safety is of the utmost importance.

Humans have something to do with most of the fire starts in the local region.

How can you improve on your fire safety?

Figure 8: Wildfire Starts Map

Recent Fire History

Many local residents have first-hand encounters with fire in the area. Some have worked hard to save their homes from a spreading fire, while others have seen smoke nearby and have wondered what to do next. Residents have expressed relief that fire was contained within a short time, gratitude that CAL FIRE was available and not fighting another fire at the time, and surprise at how close a fire seemed. Residents expressed feeling surprised, because though one may be prepared for a fire, when a fire doesn't happen for a while, it is easy to forget that it could happen at any moment. Some residents have expressed deep concerns about the lack of good communication in certain neighborhoods. In a few cases, fires have gotten very close to residential areas without much warning. Some examples of recent fire experiences in the Lower Mattole follow.

Accounts from local volunteer firefighters about a midsummer fire in downtown Petrolia (known as the Chambers Incident, 2004) highlight the importance of defensible space and water capacity. In this case, weather conditions were influencing the fire with strong evening winds, which increased the rate of spread for the fire. This fire was in a small wildland-urban interface (WUI) neighborhood. The Honeydew Volunteer Fire Company joined the attack and increased the water capacity that ultimately helped to save a home. This was the first time the Fire Atlas was used for fighting a fire. While the Atlas proved to be helpful it also inspired some of the revisions that have been made in the new edition. Defensible space varied greatly throughout the neighborhood. This limited the ability of firefighters to safely protect many homes. One structure was lost.

Accounts from local volunteer firefighters about an accidental fire in downtown Petrolia reveal the importance of proper fire safety and planning, sufficient clearance and defensible space, and communication during a fire. This fire got out of control quickly in the middle of a hillside of scotch broom. There was trouble with the fire engine's water pump and difficulty managing the water through the scotch broom, which lead to difficulty keeping up with the rate of spread of the fire. Citizens with bulldozers and a CAL FIRE air attack helped bring the fire under control. Communication with non-firefighting personnel operating bulldozers was difficult, yet effective.

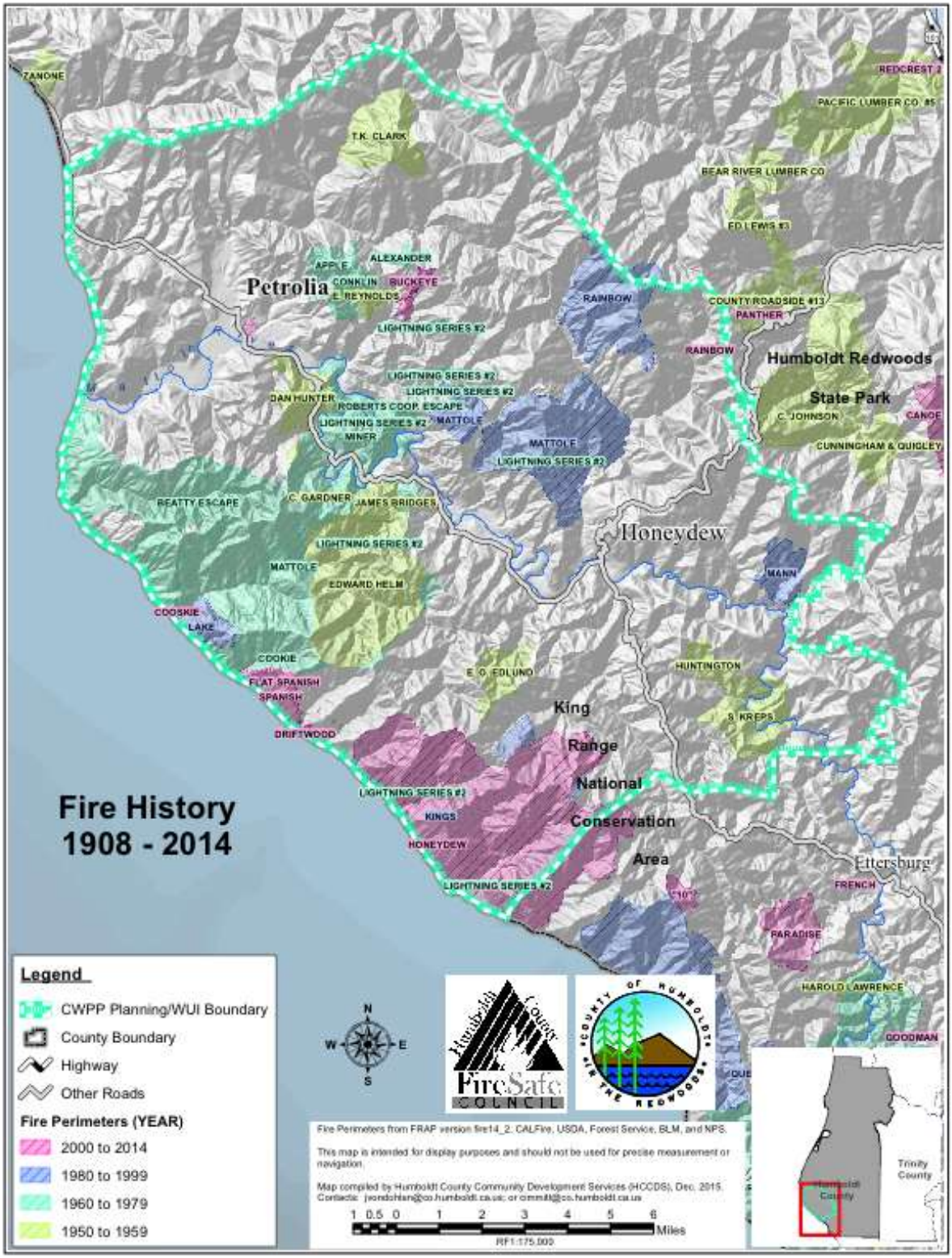
Accounts from local volunteer firefighters about an escaped burn pile reveal the importance of proper burn pile clearance. The burn pile escaped because of improper clearance and it spread through light fuels. The fire moved slowly enough for firefighters to keep up with water packs and hand tools, and the fire was put out quickly.

Local firefighter accounts of a Honeydew house fire in 2001 reveal the importance of defensible space and water storage. Though the response time was only four minutes, the house was lost and five acres of wildland burned up. The house had no defensible space, with trees nearby and brambles growing up along the house. CAL FIRE had been called out to another fire, so the

cooperation with neighboring departments and with BLM was crucial. Fighting the fire was especially limited by the small water capacity, and there was no water storage on site. The lessons learned from this fire were many. The local volunteers involved have expressed a deeper understanding and appreciation of defensible space. Even a minimal amount of clearance can help immensely. Also, the need for basic fire safety with propane storage, and the value of the mutual aid agreements with other local districts is very important. The suggested water storage capacity from CAL FIRE is 2,500 gallons. To fight this relatively small fire, 10,000 gallons of water were used.

Understanding where fires have occurred recently and historically is an important part of fire management and planning. The map on the following page shows fires in the Lower Mattole from 1908 through 2014. From 1908 through 1939, there are no recorded fires as it might have been prior to efficient recordkeeping.

Figure 9: Fire History Map



Fire Hazard and Risk Assessment

There are many hazards associated with wildfire in the Mattole watershed that are assessed in this plan. Wildfire can have a dramatic impact on air quality. The elderly and those with pre-existing respiratory conditions are especially vulnerable. In addition, several locations within the watershed house irreplaceable cultural resources that could be damaged or lost if fire is not managed appropriately. The rural communities in the planning area have several important resources including schools, post offices, stores, and community facilities that should be considered in all fire risk assessments. There are also economic assets to consider, including merchantable timber, active rangeland, recreation, and more. Lastly, the analysis of ecological hazards that result from stand changing fire, or fire in sensitive areas, will round out the hazard assessment.

Tree Disease

Sudden Oak Death is one major factor that is anticipated to significantly change the Mattole environment in the future. [24] Sudden Oak Death (SOD) is a tree disease caused by the plant pathogen *Phytophthora ramorum*. The disease kills some oak species and has had devastating effects on forests in California and Oregon. The majority of oaks in the Lower Mattole landscape are tan oaks, which are especially susceptible to the disease because they can contract the pathogen through the trunk or leaves. Forest pathogens are not uncommon, and many trees die from them. However, more times than not, trees show signs of infection and do not die. There are many things that can infect trees. These include insects, defoliators and bark and wood borers, nematodes (parasitic worms), bacteria, viruses, and fungi. The uncommon and potentially dangerous aspect to SODS is that it is believed to be an introduced pathogen which has little natural resiliency in native oaks. Possible threats of SODS include: a change in species composition in infested forests and therefore, in ecosystem functioning; loss of food sources for wildlife; a change in fire frequency or intensity; and decreased water quality due to an increase in exposed soil surfaces.[25] Widespread tan oak mortality may lead to increased fuel loads, therefore lead to increased fire hazard. High intensity fires can in turn have dramatic effects on forest composition and dynamics, and can lead to expensive firefighting operation, further risk to community assets, and to the public.[26]

24 "Mattole Integrated Coastal Watershed Management Plan"

25 www.suddenoakdeath.org

26 Metz, Frangioso, Meentemeyer, Rizzo. "Interacting Disturbances: Wildfire Severity Affected by Stage of Forest Disease Invasion." Ecology Society of America, vol. 21 no. 2, 2011.

For seven years the Mattole Restoration Council has been monitoring for the Sudden Oak Death (SOD) pathogen, Phytophthora ramorum, using methods such as stream sampling and ground surveys. SOD has already had severe impacts on oaks in our neighboring watersheds and counties, including the Eel River watershed and Mendocino County. The pathogen has been detected in several streams in the Mattole watershed, including Blue Slide Creek, Fire Creek, Crooked Prairie, Mattole Canyon Creek, Grindstone Creek, and the main stem Mattole River at both Thorn Junction and Ettersburg.

Field crews try and pinpoint terrestrial infestations ahead of the main disease front, and attempt to slow the disease's spread from those hot spots. SOD management is currently very experimental, however, some treatments have been found to slow the spread of the pathogen in early detection areas. These treatments include the removal of surrounding host trees, such as California bay laurels because these species greatly contribute to the spread of the disease. P. ramorum spore loads may also be reduced through the removal of infected trees as well as the neighboring symptomatic hosts along with the clean-up of host litter underneath the canopy before winter rains enhance spore dispersal.

Key observations about SODS from the University of California include the following:[27]

- Prescribed fires and wildfires have been shown to reduce SOD, but not completely eliminate it.
- A temporary result of SOD is dead oak leaves on trees, which may lead to an increased crown fire ignition rate.
- SOD is an ongoing concern for firefighters who need to adapt to different firefighting tactics and safety mitigation.

Climate Change

"The science surrounding human-caused climate change continues to strengthen and the weather patterns that shape the ecosystems where we live and work may be altered dramatically over the coming decades. In anticipation of such changes it is important to consider how fire management strategies may enable us to respond to a changing global climate and thereby reduce potential disruptions to plant communities, fire regimes and, ultimately, ecosystem processes and services."28

[27] Chris Lee. "Sudden Oak Death and Fire in California."University of California, 2009.

[28] The Association of Fire Ecology and the Third International Fire Ecology and Management Congress. "The San Diego Declaration On Climate Change and Fire Management." November 2006.

Climate change research and predictions indicate that the intensity and severity of wildfires will greatly increase over the next century. This finding is mostly based on climate change resulting in a longer dry season. Ecosystem resiliency is a key component in the face of climate change and the potential damaging ecological, social, and economic impacts it may have.[29] Global climate change has the potential to significantly change the watershed in terms of precipitation and temperature regimes, species compositions, native forest and grassland communities, and impact to human water supplies and agriculture.

> *"As temperatures increase, fire will become the primary agent of vegetation change and habitat conversion in many natural ecosystems. For example, temperate dry forests could be converted to grasslands or moist tropical forests could be converted to dry woodlands. Following uncharacteristic high-severity fires, seedling reestablishment could be hindered by new and unsuitable climates. Plant and animal species already vulnerable due to human activities may be put at greater risk of extinction as their traditional habitats become irreversibly modified by severe fire. Streams and fisheries could be impacted by changing climates and fire regimes with earlier peak flows, lower summer flows, and warmer water even if ecosystems don't burn. Finally, extreme wildfire events and a lengthened fire season may greatly increase the risk to human lives and infrastructures, particularly within the wildland urban interface."* [30]

> *"Burning under the relatively mild weather conditions of a prescribed fire produces lower intensity burns and, generally, less carbon emissions than would a fire burning under wildfire conditions."* [31]

Research and planning to understand and guide management that builds resilience from climate change impacts is ongoing and continuous. Interested parties should contact the MRC for the latest information, call 707-629-3514, or by e-mail at: mrc@mattole.org.

[29] Watershed Plan 2020

[30] BC Ministry of Forests and Range Wildfire Management Branch. "Climate Change and Fire Management Research Strategy." 2009.

[31] Mattole Restoration Council. 2009 State of the Mattole Series: Number 1 – Fire. August 31, 2009.

Earthquakes and Fire

The Mattole watershed is located in one of the most geologically active places in North America. Three tectonic plates meet offshore, the North American, the Gorda, and the Pacific, forming the Mendocino Triple Junction. This network of faults produces many earthquakes, including the large and devastating events of 1952 and 1992. Rates of uplift in the BLM's King Range are among the highest anywhere in North America. Both large earthquakes led to structure fires in the area. Fire preparedness and emergency communication are a crucial part of earthquake preparedness for the Lower Mattole area.

Do you have an emergency kit?

Does it cover earthquake and fire needs? For tips on disaster preparedness go to:

www.calema.ca.gov

Air Resources

The North Coast Unified Air Quality Management District (NCUAQMD) is the regional government agency tasked with achieving and maintaining healthful air quality throughout Humboldt, Del Norte and Trinity Counties. This is accomplished through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues.

The air in Humboldt, Del Norte and Trinity County does not fully meet the state health standards for clean air. The two pollutants of greatest concern are ozone and particulate matter.[32] A fire will contribute to the particulate matter in the air. Green materials, in particular, produce more smoke and heavier particulates that are damaging to breathe. For that reason, burn piles and firewood should be dry before intentionally igniting.

Burn permits must be obtained through the NCUAQMD. For more information, or to obtain a permit see the contact information below.

North Coast Unified Air Quality Management District

2300 Myrtle Avenue
Eureka, CA 95501
(707)443-3093 FAX (707)443-3099
Hours of Operation: Monday-Friday 9:00 - 12:00 and 1:00 - 4:00.

[32] http://www.ncuaqmd.org

Cultural Resources

The Lower Mattole contains some cultural resources that may require special management and fire protection. The following is general list of some of the cultural resources in the Lower Mattole.

- Shell mounds
- Historic sites
- Historic buildings
- Cemeteries

Community Resources

The towns of Petrolia and Honeydew are small, rural, and rely heavily on the few available community resources, some of which include:

- Mattole Valley Community Center
- Mattole Union School and Triple Junction High School
- Mattole Salmon Group Office
- Honeydew School
- Mattole Grange
- A. W. WAY county park, and other campgrounds
- Petrolia Post Office, General Store and Fire Department
- Honeydew Post Office and General Store
- Honeydew Fire Company stations
- CAL FIRE station
- Dick Scheinman's Clinic
- Mattole Church Camp

Structural Vulnerability

The homes of those who reside in the Lower Mattole area are an incredibly valuable asset. A few of these homes are historic to the community, and many are incredibly unique and artistic structures. It is important to protect these structures as much as possible from fire.

A house burns because of its interrelationships with its surrounding home ignition zone. This zone principally determines the potential for home ignitions during a wildland fire. It includes a house and its immediate surroundings within 100 to 150 feet. To avoid a home ignition, a homeowner must eliminate the wildfire's potential relationship with his/her house. This can be accomplished by interrupting the natural path a fire takes. Changing a fire's path by clearing a home ignition zone is an easy-to-accomplish task that can result in avoiding home loss. To accomplish this, flammable items such as dead vegetation must be removed from the area

immediately surrounding the structure to prevent flames from contacting it. Also, reducing the volume of live vegetation will reduce the intensity of the wildfire as it enters the home ignition zone.

Residents can reduce their risk of loss during a wildfire by taking actions within their home ignition zones. Relatively small investments of time and effort will reap great rewards in wildfire safety. For example, federal and state resources can spend less time protecting individual homes and focus on managing wildfires if hazards in the home ignition zone are reduced. In addition, local fire departments can focus on extinguishing structure fires and spend less time preventing the fire from spreading to neighboring home ignition zones and/or to the wildland.

A very common issue encountered within the CWPP planning area is the accumulation of flammable debris on rooftops and gutters, like leaves, needles, and, moss. This debris is very flammable tinder that can be ignited by fire brands blown from wildfires that can come from miles away. Fires started on the roof can spread to the rest of the home quickly. Residents can eliminate this hazard with relative ease. It should be one of the first actions taken to reduce the risk of losing the home to wildfire.

Flammable roofing and siding is a problem with some homes in the CWPP area. Replacing roofing with a fire resistant material will greatly reduce the ignition potential of the structure. Replacing siding can be a much bigger and more expensive job. It is important to consider the toxicity of any materials being used, and to look into alternative building materials. The LMFSC can help with a resource list of alternative fire resistant building materials.

Making plans for fire resistant renovations is something that residents should consider a high priority when creating a plan of action towards fire safing property and structures. All new home construction should be done with fire resistant materials. If it is not feasible to renovate or choose these materials, it is important to pay extra attention to the home ignition zone.

Many homes in the planning area have dense vegetation growing in the home ignition zone. Residents should remove the ladder fuels and prevent fire from moving up into the crowns of trees or onto the house and its attachments. It is not necessary to eliminate all vegetation from within the home ignition zone. The important action is to break up the continuity and density of the vegetation.

Observations have been made in the planning area of homes with wood piles, fences, gates, and wood lattice in contact with structures. Dead leaves under decks or along foundations of structures were also observed in some cases. These items are generally more susceptible to combustion from embers or radiant heat and, if lighted, could lead a fire to the rest of the home. Residents should remove these materials and regularly rake and sweep away debris, leaves and needles from the area right around the home.

Wildland Urban Interface

A wildland–urban interface (WUI) refers to the zone of transition between unoccupied land and human development. Communities that are within 0.5 miles (0.80 km) of the zone may also be included. These lands and communities adjacent to and surrounded by wildlands are at risk of wildfires.[33]

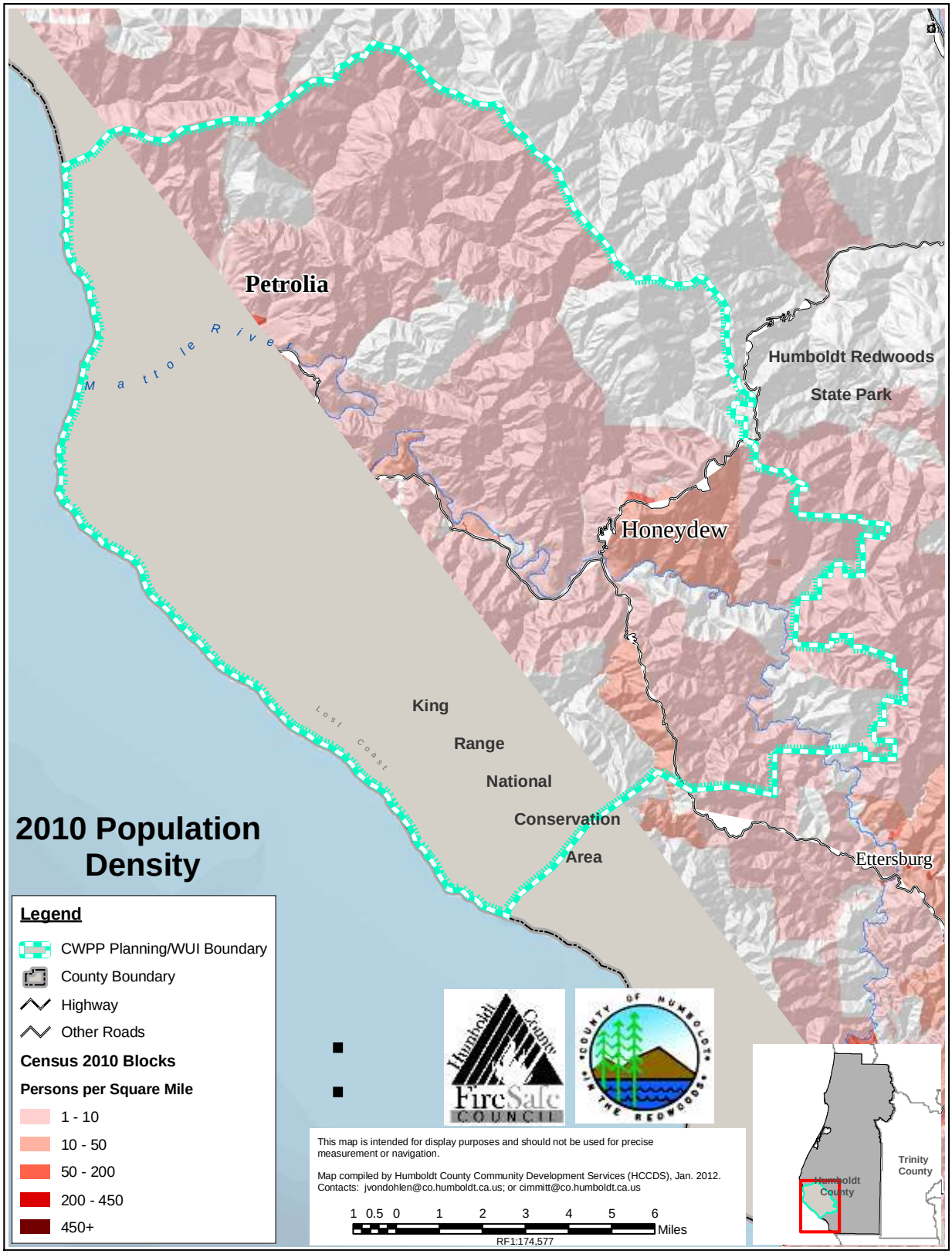
After considering the location of the inhabited areas, the critical human infrastructure, and the risk of wildfire, nearly all of the CWPP planning area has been identified a wildland-urban interface (WUI) zone. This was determined because of how intermixed the population is with the wildlands across the landscape. The area that is excluded from the WUI zone is the BLM King Range National Conservation area. The WUI borders this area, and fills the rest of the CWPP planning area. The designation of this boundary was accomplished through the collaborative efforts of the LMFSC, CAL FIRE, and BLM.

Whuwee! Welcome to a Wildland-Urban-Interface Zone, or WUI. What this really means is that the "wildlands" and their wildfires are our neighbors out here in the Lower Mattole.

Living with fire as an occasional neighbor is a big responsibility. How do you plan on doing your part?

33 http://en.wikipedia.org/wiki/Wildland-urban_interface

Figure 10: 2010 Population Density Map



Community Hazard Assessments by Neighborhood

The planning area is composed of several distinct neighborhoods. These include:

- Wilder Ridge
- Downtown Honeydew
- Panther Gap
- Windy Nip/Doreen Drive
- Green Fir/New Jerusalem
- Downtown Petrolia
- Conklin Creek
- Lower North Fork
- Lighthouse Road
- Prosper Ridge

These neighborhoods have seen varying degrees of fuel reduction activity and project planning so the following neighborhood descriptions provide a focused look at the needs and opportunities in each. As a general rule, no neighborhood is devoid of needs, with increasing available emergency water supply identified as a necessity in all areas within the planning area.

As mentioned previously, better representation for most of these neighborhoods on the LMFSC is needed as well as expanding the NEST List to Wilder Ridge, Honeydew, Panther Gap, and Windy Nip.

The following pages contain assessments for each of the neighborhoods listed above.

Wilder Ridge

Biological Assessment

The Wilder Ridge area contains some of the last remaining old-growth forests in the Mattole watershed. Most of the old-growth parcels are held by the BLM and the Save the Redwoods League. Many details are covered in the Gilham Butte Cooperative Management Plan.

Safety Assessment

The subdivision along the Wilder Ridge Road is composed of many narrow parcels, packed in next to each other, that back down the ridge top. Most structures in the neighborhood are relatively close to one another. This neighborhood has seen several fuel reduction projects along roads and around homes. Fuel reduction projects are an ongoing challenge for most Lower Mattole areas, and this neighborhood is no exception. While a lot of work has been done, much is left to do, including important maintenance projects on areas previously treated. In 2014 and 2015, the California Conservation Corps treated several parcels along the county road but only with expressed permission, another challenge though participation has been increasing.

Water can be scarce along the ridge during the summer. While many water tanks have been placed in this neighborhood, water is still a major limiting factor for firefighters. More community water tanks designated for fire, ideally located at the intersections of each of the main roads would help potential firefighting efforts. Also, landowners who have installed water tanks need to be followed up with to make sure the tanks are functioning, and possibly to help with upgrades.

In September 2014, a new fire hall was dedicated on Wilder Ridge in memory of Gary 'Bub' Haga Jr. The fire hall holds a water tender and a small quick-attack fire engine, a welcome addition to the ridge's defense from

wildfire. Otherwise, other fire engines face a long, steep ascent from either direction on their way to reach most homes in the area.

Wilder Ridge has some of the highest fuel loads in the valley, including the extremely flammable species of manzanita, whitethorn, and chemise, dense stands of tan oak, fir, and madrone.

Economic Assessment

- Merchantable Timber
- Active Rangeland
- Ridgetop Nursery
- BroDoFed Kennel
- Fire Hall

Downtown Honeydew

Biological Assessment

The principal biological priorities in the Honeydew neighborhood are the riparian areas of the Mattole River maintstem, the Upper North Fork and Honeydew Creek along with the smaller tributary confluences.

Safety Assessment

The Honeydew area has a diverse variety of properties, from expansive river valley ranches to more populated hilltop subdivisions. Fuel loading is generally not as heavy as in some areas, but homes are scattered throughout. The Panther Gap, and Wilder Ridge neighborhoods are at a very high risk for an interface fire.

There are a lot of light, flashy fuels mixed with tan oak and Douglas-fir, with potential for a fast-moving fire affecting many homes in its path. Community water storage tanks along with continued promotion of defensible space projects are avenues towards reducing risk in this area. The Honeydew area would benefit from the continued expansion of the NEST list. The

Honeydew Elementary School is located here. Ensuring the safety of the children in the case of a fire while they are in school is a high priority for this neighborhood.

Economic Assessment

- Honeydew Store/Post Office/Cafe
- Honeydew School
- Etter Construction
- CAL FIRE Mattole Fire Station
- Mattole Blueberry Farm
- Mattole River Organic Farms and Country Cabins
- Several Areas of Active Rangeland

Panther Gap

Biological Assessment

The Gilham Butte Cooperative Management Plan includes areas in this neighborhood as well. Just over the east ridge of the Mattole watershed is the Humboldt Redwoods State Park and its Rockefeller Grove, home to the largest stands of ancient redwood forests on Earth. Although an unlikely scenario, efforts are still needed to ensure that a fire that might start in the Panther Gap area does not spread down into the ancient redwoods of the park. Maintaining and expanding shaded fuel breaks between these areas and residential/subdivision areas would help to reduce the chances of fires spreading from either area to the other.

Safety Assessment

The Panther Gap neighborhood is very remote, with many homes and structures. There is one narrow dirt road that provides access for over 40 homes. The neighborhood is bordered on one side by Humboldt Redwoods State Park and Bureau of Land Management parcels. Most of the homes are on one of the two ridgelines on either side of Middle Creek, along the South Panther Gap Road, and Stewart Ridge Road. There are homes that may take an hour to reach from the pavement.

Panther Gap has many absentee landowners. There is a heavy fuel load in the area, primarily comprised of dense stands of Douglas-fir, oak, and whitethorn. Panther Gap area residents would benefit greatly from strategic fuel reduction projects. An escape plan needs to be developed, which may need to include emergency routes not normally opened.

While a few water tanks have been placed in this neighborhood, water is still a major limiting factor for firefighters. Also, landowners who have installed water tanks need to be followed up with to make sure the tanks are functioning, and possibly to help with upgrades.

Economic Assessment

- Potentially Merchantable Timber

Windy Nip/Doreen Drive

Biological Assessment

The Windy Nip neighborhood borders Humboldt Redwood Company and Humboldt Redwoods State Park. The same concerns exist relating to the Humboldt Redwoods State Park as with the Panther Gap neighborhood. Shaded fuel breaks between these areas and residential/subdivision areas would help to reduce the chances of fires spreading from either area to the other. The Cuneo Creek Fire provides an example of a fire starting on the Park side of the ridge. This fire did not move over the ridge into the Windy Nip area. However it could have, given the right conditions. There is a higher amount of natural oak woodlands and grassland areas in this assessment than most others. Including ridgeline fuel reduction treatments and or prairie reclamation treatments would help improve resiliency to wildfire.

Safety Assessment

The Windy Nip neighborhood is very remote, with many homes and structures spread throughout. There are a few narrow dirt roads with some evacuation issues. There are homes that may take a half an hour to reach from the pavement. The landscape ranges from some dense stands of Douglas-fir and oak, to grassy open lands with some oaks and whitethorn. An escape plan needs to be developed, which may need to include emergency routes not normally opened, through the Park and across the Mattole River towards Honeydew.

While a few water tanks have been placed in this neighborhood, water is still a major limiting factor for firefighters. Also, landowners who have installed water tanks need to be followed up with to make sure the tanks are functioning, and possibly to help with upgrades.

Economic Assessment

- Humboldt Redwood Company Timber Lands
- Active Rangelands

Green Fir/ New Jerusalem

Biological Assessment

The Mattole River and several tributaries comprise a main geographical feature in the neighborhood. Some land is under conservation easement. There are several small remnants of ancient forests found here in Upper Squaw Creek and Indian Creek that are within the BLM King Range. These areas should be protected from catastrophic fires.

Safety Assessment

The Green Fir neighborhood has expanded over the last few years, and now many homes and residents populate this area. While the New Jerusalem neighborhood has not grown much, most of the population lives relatively close to the Mattole River.

There are a wide variety of fuel types, with notable stands of invasive scotch broom. Many homes are located near the A.W. Way County Park. This campground brings in many people several weekends during the summer. The continued promotion of defensible space around homes, as well as the placement of community water tanks, will do the most towards reducing risk in this area. While the slide on Green Fir Road has been repaired, it is still a very narrow road with no alternative exit route.

Economic Assessment

- Mattole Grange
- A.W. Way Park
- Mattole Camp and Retreat Center
- Several Areas of Active Rangeland

Downtown Petrolia

Biological Assessment

The only identified biological priorities in the downtown Petrolia area are the riparian areas along the main stem and Lower North Fork of the Mattole River.

Safety Assessment

Water storage is a key safety issue for downtown Petrolia, as it is one of the most densely populated areas in the Lower Mattole Assessment area. Most homes are on well systems that cannot provide sufficient emergency water supplies. Continued work towards expanding the fire water supply in this neighborhood is important, as well as following up with landowners who have tanks.

Continuing to help local residents fire safe their properties is important, given the proximity of the houses. The areas around the Mattole School are still of concern, including the eucalyptus trees along the bottom of Chambers Road, and directly across from the school. Fuel reduction in this area is a top priority to help protect the Mattole School and Mattole Valley Community Center.

Thick blackberry bramble and Scotch/French broom thickets are fire hazards along much of the roadway and up into grasslands. Recently, long unbroken wooden fences have also increased the risk of spreading a roadside spark. There are scattered unmaintained, abandoned and/or undeveloped parcels with heavy fuels.

Economic Assessment

- Petrolia Store/Post Office
- Several Lodges/Camp and/or RV Sites
- Mattole Valley Community Center/Mattole Restoration Council
- Mattole School
- Dr. Dick Scheinman's Clinic
- St. Patrick's Church and 7th Day Adventist Church
- Several Areas of Active Rangeland
- Petrolia Volunteer Fire Department

Conklin Creek

Biological Assessment

The Mattole River and Conklin Creek comprise the main biological features at risk in the neighborhood.

Safety Assessment

The Conklin Creek neighborhood has expanded over the last few years, and now many homes and residents populate this area.

There are a wide variety of fuel types here, from open grassy hillsides and oak to dense Douglas-fir stands. The continued promotion of defensible space around homes, as well as the placement of community water tanks, will do the most towards reducing risk in this area.

Conklin Creek Road has a very narrow and dangerous bottleneck (one-way traffic) due to a landslide. Evacuation routes could be worked on in this neighborhood, with some existing roads that may offer alternative routes over the ridgelines toward Chambers Road or into the Upper North Fork drainage.

Economic Assessment

- Active Rangeland
- Merchantable Timber
- Humboldt Redwood Company Timber Land
- Lost Coast Nursery and Farm

Lower North Fork

Biological Assessment

The Lower North Fork Mattole is a biological priority in this area. The river is very open and shallow in much of the lower drainage, with very few pools that can serve as a water source for firefighting.

Safety Assessment

Prevention of human-caused ignitions is a priority as the local restaurant/bar is frequented from both directions. There have been several car accidents to the west which is primarily grass/wild rose pastureland. As with all neighborhoods, increasing the amount of available water for firefighting and improving defensible space around homes is always a positive step.

Economic Assessment

- Yellow Rose
- Safier Construction
- Active Rangeland
- Church of Scientology
- Merchantable Timber

Lighthouse Road

Biological Assessment

The Mill Creek Forest, a BLM designated Area of Critical Environmental Concern, includes some of the last ancient Douglas-fir forest left in the lower Mattole watershed. Keeping catastrophic fire out of Mill Creek Forest is a priority.

Safety Assessment

Many fuel reduction projects have occurred in this neighborhood. Continuing to create and expand defensible space around homes, especially in the more densely populated areas along Evergreen Way, is important. Continuing efforts to create more water storage is a key safety issue for Lighthouse Road, as well as following up on the maintenance of existing water sources. Continuing fuel reduction along the Molly West Road and working on the tight spots to

create better access for fire trucks would be beneficial. Creating a rideline fire break between Mill Creek and Stansberry Creek will help reduce the risk of wildfire spreading from one area to the next while allowing safer access for fire fighters and is underway as of 2015.

Lighthouse Road has a bottleneck just past the Groeling residence where one-way traffic only is accommodated. In addition, due to the public Mattole Beach at the end of the road, it is one of the worst maintained roads in the valley with deep potholes commonplace.

Economic Assessment

- Groeling's Wood Shop
- Mattole Salmon Group Office
- Active Rangeland
- Merchantable Timber

Lichens and Mosses up the Mill Creek Trail

Prosper Ridge

Biological Assessment

Prosper Ridge is almost entirely surrounded by BLM-managed lands. It runs along the top of the BLM Mill Creek Forest. Given that Mill Creek is an old-growth, protected forest, efforts need to be made to keep a fire from Prosper Ridge from spreading into this forest, or vice versa.

The King Range National Conservation Area (KRNCA) surrounds Prosper Ridge to the west and south, and somewhat to the east. Much of this area has been designated as wilderness. Efforts should be made to keep a fire on Prosper Ridge from spreading into the KRNCA. However, due

to recent incidents a fire is more likely to start in the KRNCA—probably on the beach—and spread up into the homesteads on Prosper.

Safety Assessment

Three fuel reduction projects have occurred on Prosper Ridge as well as FLASH projects. Continuing this effort is very important. Continuing to work on emergency evacuation plans for the residents of Prosper Ridge is of utmost importance. Access is another important issue. The roads that lead to Prosper Ridge are winding, single-lane roads with few turnouts. Some roads have tight forest canopy overhead, often scraping vehicles. Continuing to work on brushing roads and continuing fuel breaks along roads and ridges would be helpful. There are potential and existing landslides on some roads that make them nearly unusable, especially in the rainy season. More serious heavy equipment work to ensure safe passage on several of these roads may still be an issue. A slide on the Upper Bear Creek Road still exists, and poses a serious problem for evacuation and access for fire trucks. Several families live just above and beyond this slide area. Fixing this slide and brushing this road is a priority for emergency evacuation. Major access roads on the public lands are also in serious need of fuels treatments. Some sections have been coarsely done by concerned neighbors in order to maintain driver visibility. Fuels on the public lands, in general, are extremely high shifting what once were prairie ecosystems to young thick and volatile Douglas-fir stands. A prairie restoration project on public lands to remove encroached fuels is ongoing since 2014.

Water storage is another critical safety issue on Prosper Ridge. A few community water tanks have been set up at accessible locations throughout the neighborhood. However more water sources would still be beneficial to ensure access to water by firefighters.

Economic Assessment

- Merchantable Timber
- Active Rangeland

Wildfire Protection Capabilities

Wildfire protection capabilities include both firefighter response capabilities and fire prevention capacity.

Community Identified Protection Resources

During LMFSC meetings and other community events and meetings, evacuation routes, water sources, and safe zones were examined and some were identified. Information was added to the Mattole Fire Atlas based on these meetings. The Fire Atlas identifies firefighting resources like fire stations and trucks, and water tanks and ponds. The Fire Atlas also shows the known locations of structures. The Atlas is not distributed publicly. Copies are made available to the PVFD, HVFC, CAL FIRE, and the MRC. In 2014, two new copies were made in order to bring to meetings so that residents can correct pages.

Firefighter Response

Local fire protection is provided by the HVFC, the PVFD, and the CAL FIRE Mattole and Weott stations. The HVFC and the PVFD are the first line of response in medical emergencies, structure fires, and wildland fires. In addition, some neighborhoods, like Prosper Ridge, maintain smaller fire engines and other equipment for use.

The VFD's have a myriad of needs and challenges. Currently the most pressing challenges stem from maintaining old equipment and apparatus.

The CAL FIRE Mattole station operates during the fire season, usually from June through October, depending on the fire season and other CAL FIRE staffing needs in the Humboldt-Del Norte Unit. When extended service is needed, the CAL FIRE Weott station sends equipment and personnel to the Lower Mattole Area. Depending on the site of the incident, it takes at least an additional 45 minutes for arrival.

Community Preparedness

How prepared a community is for wildfire includes the culmination of such things as: the effectiveness of the local fire safe council, if the community is recognized by the National Firewise program, and if local fire protection agencies conduct fire prevention programs.

At present, the local Lower Mattole Fire Safe Council is in great need for additional members and community representatives. The council is currently working on this issue.

The Firewise Communities/USA program provides a unique opportunity to America's fire-prone communities. Its goal is to encourage and acknowledge action that minimizes home loss to

wildfire. It teaches community members to prepare for a fire before it occurs. [34] Both Petrolia and Honeydew have maintained Firewise status since 2011.

The Mattole Restoration Council (MRC) and the LMFSC have been working together on community fuels reduction projects and Fire-Safe education over the last decade. Along with help from the County of Humboldt, CAL FIRE, Federal grants through the FSC Grants Clearinghouse, BLM, and State Parks, the LMFSC and the MRC have contributed much to the overall education and fuel reduction project implementation available to the local community. In particular, many homes have benefited from projects that target the home ignition zone. The council regularly asks representatives to identify defensible space projects for low-income people. In 2013 the MRC obtained a chipper. The chipper has done one free Chipper Day to residents near the county road and with grant funding more will be offered. The chipper with crew is also available for rent in the Lower Mattole community.

[34] www.firewise.org

Community Emergency Preparedness and Planning

Planning for potential disasters like fires and earthquakes helps to save lives and allows for streamlined responses and recovery. There are two emergency resources created to serve the community within the Lower Mattole CWPP: the Neighborhood Emergency Services Teams (NEST) and the local Office of Emergency Services (OES) representatives.

Lower Mattole Emergency Communication and Planning

Neighborhood Emergency Services Teams - NEST

The Neighborhood Emergency Services Teams (NEST) list was created after the 1992 earthquake to provide a structure for emergency communication in and around Petrolia. Since then, the NEST has served as a useful community resource for many, including having easy access to contact information for medical and fire services. For the duration of the NEST there has been some relationship between the NEST, OES, and local fire.

The NEST is supported and updated through the Mattole Valley Community Center. To make a more seamless emergency communication system for the communities of the Lower Mattole the NEST will need to be further expanded to better include the communities of Honeydew and Ettersburg. There has been resistance to this in the recent past due to the way the current NEST is used as a local phone book, and how public the information is. This issue will need to be thoroughly reviewed and accommodated in order to best serve these communities.) Another part of improving the NEST includes better training and equipment for NEST neighborhood leaders to communicate up and down the communication system. Currently, the NEST is fully reliant on phone communication, and in the instance of certain disasters, the phone system may not be reliable. The LMFSC is in a good position to help expand the NEST areas and provide emergency communication training for NEST leaders. The LMFSC may also be able to integrate LMFSC neighborhood representatives into the NEST structure and vice versa.

California Office Emergency Management Agency - OES

The California Office Emergency Management Agency (OES), through the Federal Emergency Management Administration (FEMA) exists to enhance safety and preparedness in California through strong leadership, collaboration, and meaningful partnerships. The mission of the OES is founded in public service. Their goal is to protect lives and property by effectively preparing for, preventing, responding to, and recovering from all threats, crimes, hazards, and emergencies.

Locally there are two OES representatives, one near Honeydew (Claire Trower) and one in Petrolia (Travis Howe). Through the NEST and the local volunteer fire departments, the OES representatives are the line of communication between emergency community needs and OES.

Strategies, Practices and Resources for Residents

Is Your Home Ready for the Next Wildfire?

Considering that wildfire is inevitable in this neck-of-the-woods, all of your hard work towards fuels reduction and fire safing will pay off. Once you start, it will seem much less daunting.

There are many resources available to help landowners reduce the threat of fire damage to their properties. If you don't know where to start, visit some well maintained land similar to your own. Look through available literature on maintaining the home ignition zone and on reducing fuel loads (see Appendix B for resources). Start a plan of action that includes yearly tasks, as well as projects to work towards in the future.

The MRC participates in a program to help landowners with reducing fuel loads within the home ignition zone called Fire-Adapted Landscapes and Safe Homes or FLASH. To find out more about this program contact the MRC (707-629-3514) or visit their website for more information: www.mattole.org. The FLASH program, however, is dependant on federal funding through the County of Humboldt.

Forest Management for Fire Safety

Thinning dense forest stands decreases the threat of catastrophic fire and increases the vigor of remaining trees. For those who want to commercially harvest their timber, the MRC recently completed a Programmatic Timberland Environmental Impact Report (PTEIR) that gives landowners streamlined approval for their logging plans, provided their harvest meets significant light-touch standards. For more information on the PTEIR, contact the MRC. There are other options for permitting thinning projects commercially, including using a fuels reduction exemption, and a dead and dying trees exemption which was further strengthened by Governor Brown in 2015 due to drought mortality.

Fuel reduction and thinning projects can lead to an accumulation of burn piles unless the material is reduced through other mechanical means like chipping. It is important to always burn safely and within the guidelines and laws set forth. Once sufficient fuel reduction has taken place it may be appropriate to practice low intensity burns across certain areas of land. The local fire departments in the Mattole have helped landowners with small prescribed fires, and often use them as training for the departments. This relationship between local landowners and fire departments could be expanded .

A Note on Being Home-Front-Centric

A house burns because of its interrelationship with everything in its surrounding home ignition zone – the house and its immediate surroundings. To avoid a home ignition, a homeowner must eliminate wildfire's potential relationship with his/her house. This can be accomplished by interrupting the natural path a fire takes. Changing a fire's path by clearing a home ignition zone is an easy-to-accomplish task that can result in avoiding home loss. To accomplish this, flammable items such as dead or overhanging vegetation must be removed from the area immediately around the structure to prevent flames from contacting it. Also, reducing the volume of live vegetation closeby will affect the intensity of the wildfire as it enters the home ignition zone. [35]

Defensible space is so important, that is required by law.

Next time you drive up to your house, think about what it might take to get a fire truck

Fuel-Free Zones

The space immediately surrounding a home or structure is a top priority area. A fuel-free space will minimize fire spread and give firefighters a chance to save a home or structure. A home without a fuel-free space can make firefighting difficult, if not impossible.

Defensible Space

Defensible space is essential to improve your home's chance of surviving a wildfire. It is the buffer you create between a building on your property and the grass, trees, shrubs, or any wildland area that surround it. This space is needed to slow or stop the spread of wildfire, and it helps protect your home from catching fire – either from direct flame contact or radiant heat. Defensible space is also important for the protection of the firefighters defending your home.[36]Reducing horizontal and vertical fuels can help slow an oncoming fire. Light fuels can be lopped and scattered for removal by decay. Pile burning during safe burn windows can help and so can a good quality chipper.

It is important to consider the type of building materials before building or when upgrading a structure. See Appendix B for a list of resources including construction materials and methods that will decrease the fire risk to buildings.

[35] Adapted from Firewise/USA. http://www.firewise.org.

[36] http://www.readyforwildfire.org/defensible_space

Burning Guidelines, Rules and Regulations

Pile and broadcast burning can be an effective tool for fuel management and restoration. It is extremely important to be prepared, plan well, have plenty of assistance, and to get help from those who have experience burning. A well-planned burn can be a great neighborhood event, and a poorly planned burn can be a disaster. Find out who has experience with burning, and seek out their advice on your project.

The North Coast Unified Air Quality Management District (NCUAQMD) issues both Agricultural and Residential burn permits. During the declared fire season, additional permits are required by CAL FIRE and need to be obtained at one of their offices. Three dollars of every residential permit fee collected goes to local volunteer fire districts.

Possession of a valid burn permit is mandatory when burning dry natural vegetation outdoors for the purpose of disposal. NCUAQMD burn permits are not required for small recreational or ceremonial campfires. Permits can be applied for online: www.ncuaqmd.org.

Evacuation – Ready, Set, Go!

Having an evacuation plan in case of a wildfire is an important part of planning for emergencies. All evacuation instructions provided by officials should be followed immediately for your safety. Choosing not to evacuate can bring many unintended consequences, including risking your life, inducing severe psychological stress, and becoming trapped within a fire zone.

For more evacuation information see the following documents in the Addendum:

- Ready Set Go: Your Personal Wild Fire Action Plan
- Ready Set Go: Wildfire Preparedness for Ranchers, Farmers and Growers

For more information on evacuation, visit: www.readyforwildfire.org/3_simple_steps.

After the Fire

Once a fire or other emergency has come to a close, it is important to review the evacuation plan and emergency preparedness. Look over your previous emergency plan, and evaluate it for any changes that need to be made. Creating an assessment of your property, structures and personal safety is a good first step. A restoration plan may be necessary if the landscape is in need of replanting, or if any structures were damaged. CAL FIRE can help with establishing a restoration plan.

CWPP Action Plan

2002 CWPP Action Plan Progress

The Humboldt County website keeps an updated and complete list of all proposed and completed projects: http://gis.co.humboldt.ca.us. All projects and tasks proposed in the 2002 CWPP, as well as additions in the 2006 Humboldt County Master Fire Protection Plan, have been reviewed and considered in the current 2016 plan. Some previously proposed projects have been implemented, some have been removed, due to changing community and biological priorities, and some have been combined into new projects.

2016 CWPP Action Plan

Project Prioritization

Project proposals and ideas came out of community meetings, outreach events, regular LMFSC meetings, and partner agencies and organizations.

Where possible, the projects were ranked using a priority ranking system based on the first Lower Mattole Fire Plan as well as ideas from other local fire plans. There were five categories developed for ranking fuels projects. Projects within each category could score a rating of 3, 2, or 1. The sum of each category was used to determine the total priority ranking. The highest priority ranking a project could receive was 15, and the lowest ranking was a 5. The projects were evaluated by the LMFSC. Average rankings were used to determine overall priority. Final scores should be used only as an idea of their priority, and not as an absolute value.

Projects relating to education and outreach, fire defense, water capacity and fire ecology were ranked based on their perceived need in correspondence to current CWPP goals, as low, medium, and high.

It is recommended that the ranking process continue for newly proposed projects and the results be included in a future update of this plan.

Project Prioritization criteria used for this plan is following.

Prioritization Criteria for Fuel Projects

Community Value

Based on number of residents, and community assets like schools, community centers and recreational areas.

3 High = Several Residents

2 Medium = Dispersed Residents

1 Low = No residents

Fuel Hazard

Based on fuel loading, vegetation types: A high hazard is indicated by dense, flammable vegetation, untreated forest areas and brush.

3 High

2 Medium

1 Low

Wild Fire Risk

Based on the presumed likelihood of wild fire starting. Slope position, lightening strikes, and wild fire history were taken into account.

3 High

2 Medium

1 Low

Ecological Benefit

Based on species and systems of concern.

3 High = known threatened species and old growth

2 Medium

1 Low = no outstanding concerns

Economic Value

Based on known economic value such as private property values, power lines, agriculture, and local businesses.

3 High = High private value, power lines or major investments at risk.

2 Medium

1 Low

2016 Action Plan Summary

Based on community input and LMFSC analysis, a number of wildfire readiness improvement actions have been recommended for the Lower Mattole CWPP planning area. These recommended actions have been divided into six fire hazard mitigation categories, which are described below (letters in parentheses indicate the identification code used in the tables following this summary). Project maps that identify project #s by name are at the end of this document pages 98-101:

Empowering Residents – **(E)** Recommends actions that the LMFSC can facilitate with local residents to help distribute information and assistance with wildfire preparedness, including working with local youth. The local organizations and agencies cannot reach every resident and landscape in the Lower Mattole. Empowering residents with the information and resources to act on their own is an important part of reducing hazardous fuels, restoring fire ecology, and creating fire safe homes and landscapes. The three local schools provide an opportunity for fire education activities with youth. Working on collaborating with CAL FIRE, MRC, and local fire departments to involve students is important. Also, continuing to reach out to the local community to provide workshops and information is a priority.

Reducing Structural Ignitability – (S) Recommends actions that residents and landowners can take to reduce the ignitability of structures. Included are actions for structures and for the surrounding home ignition zones, as well as resources to help with planning and education. There are many recommendations and measures that property owners, residents, and neighborhoods can take to reduce the ignitability of structures. Some recommendations include actions that can be taken in the entire home ignition zone and not just the structure itself.

Reducing Fuels – (Mat) Recommends actions that can be taken to reduce flammable vegetation (wildfire fuel) where there is a wildfire risk. Recommendations include treatment of community-identified hazard areas, as well as treatment around structures, roads, and ridge tops. Reducing fuel is a crucial step in managing the Lower Mattole for a more fire safe environment, as well as helping to restore the fire ecology. Generally, starting around the home and structures is the first step, followed by strategically moving out to do fuel reduction along roads and ridge tops, and eventually into the spaces in between. Continuing the FLASH fuels reduction cost-share program, continuing to create new fuel breaks, evaluating and following up on completed fuel breaks, and continuing fuel reduction projects to protect communities and natural resources from catastrophic wildfire are all important parts of this task.

Enhancing Fire Protection – (P) Recommends actions for local residents to take that assist with access and water resources, as well as actions the LMFSC and local fire departments can take to help increase protection resources. The PVFD and the HVFC are always in need of support, including funding and equipment. Many local roads need to be improved for access, addressing, and mapping. Water resources are usually a limiting factor in fighting fire locally. Maintaining and adding to water resources is of the utmost importance.

Community Emergency Preparedness and Planning – (C) Recommends actions for the LMFSC and local fire departments to take for educating community members and expanding the Emergency Communication Systems. Expanding the area covered by the NEST phone system, as well as diversifying the communication available to neighborhood leaders is an important next step in making local emergency communication stronger and more equipped to handle a variety of emergencies. Also, offering training and evacuation route assistance to neighborhood leaders so they can assist their neighborhoods in emergencies is important.

Fire Ecology and Conservation/Restoration Efforts – **(R)** Recommends actions for the MRC and LMFSC to take to continue working towards restoring fire to Mattole ecosystems.

The matrices on the following pages (69-82) include the wildfire readiness project proposals that were developed from community input and LMFSC analyses. The project proposals are listed by category (those described above). Within each matrix, projects are identified by their "action name," which is followed by a "description" of the project; "possible resources" include potential collaborators or funding sources; and "responsible parties" defines which organization(s) should take the lead on the project. Each project is also given a "priority" ranking of "low," "medium," or "high," as well as a "timeline" description (see table below).

Time Frame Descriptions	
S	Short Term (1 to 5 years)
L	Long Term (5 years or more)
O	Ongoing
D	Depends on Funding

Empowering Residents (E)						
ID	**Action Name**	**Description**	**Possible Resources**	**Responsible Parties**	**Priority**	**Timeline**
E-1	Outreach Materials Distribution	Create, gather and distribute outreach materials for local residents, on fire safing and fire ecology.	Firewise CAL FIRE Humboldt County	LMFSC/MRC	High	**O** **S** S
E-2	Fire Ecology	Plan and hold events to help educate	PVFD	LMFSC/MRC	High	**O**

2016 Action Plan Project Tables

	and Safety Events	and inspire local residents on fire-safe techniques and resources, as well as on fire ecology in the Mattole Valley.	HVFC CAL Fire MRC Hum County			
E-3	Community Fire Safe Council Meetings	Hold meetings biannually- one in Petrolia and one in Honeydew to identify priority projects and discuss fundng opportunities	LMFSC	LMFSC/MRC	High	**O**
E-4	Biomass Development	Continue researching biomass feasibility.	Unidentified	MRC	Low	**L, D**
E-5	Youth Education	Attend local schools to educate youth about fire safe practices and fire ecology.	Unidentified	PVFD	High	**O**
				HVFC	Medium	**S**
E-6	LMFSC Representatives	Recruit LMFSC neighborhood representatives for all vacancies.	LMFSC	LMFSC	High	**S**
E-7	Firewise Recognition	Work to continue Firewise certification.	NFPA	LMFSC/MRC PVFD HVFC	High	**O**

Reducing Structural Ignitability (S)

Action Name	Description	Possible Resources	Responsible Parties	Priority	Timeline
Work Parties	Organize community work parties to create defensible space for those in need and as visible examples for other residents.	CAL FIRE Humboldt County USDA	LMFSC/MRC PVFD HVFC	High	**O** **S**
Information Distribution	Distribute information on defensible space requirements and helpful tips on protecting structures from fire.	CAL FIRE Humboldt County Firewise	LMFSC	High	**O** **S**
Fire Safety Assessments	Help facilitate fire safety assessments for local residents and landowners.	CAL FIRE Humboldt County	LMFSC CAL FIRE MRC	High	**O** **S**

Enhancing Fire Protection (P)

ID	Action Name	Description	Status	Possible Resources	Responsible Parties	Priority	Time line
P-1	Drafting Method	Work with CAL FIRE to identify criteria for withdrawal sites (flight times and other requirements for	Identified	USDA CAL FIRE	MRC LMFSC	Medium	**L**

Enhancing Fire Protection (P)

ID	Action Name	Description	Status	Possible Resources	Responsible Parties	Priority	Time line
		helicopters, river access for water trucks, etc…), and measures for protecting wildlife during withdrawals, including the development of a map of preferred water withdrawal sites throughout the watershed, and protocols for pumping directly from the Mattole River and its tributaries.			CAL FIRE		
P-2	Drafting Methods	Develop and implement plans with CAL FIRE and local fire departments for stream drafting standards and equipment (such as fish screens) that minimize impacts to aquatic habitat.	Identified		MRC LMFSC CAL FIRE	Medium	**L**
P-3	HVFC Building	Creation of more buildings for fire trucks and resources for the HVFC.	In Progress		HVFC	Medium	**S**
P-4	Fire Department Assistance	Acquisition of resources and supplies for the PVFD and HVFC.	Identified	USDA	LMFSC/MRC PVFD HVFC	High	**O**
P-5	Water Tanks	Maintain and increase fire water resources, including the installation of additional tanks/provide incentives for landowners that voluntarily install water storage for fire use. Share fire water information with CAL FIRE	Identified		LMFSC/MRC	High	**O**
P-6	Water Check	Check on all existing water tanks, check in with landowners, and upgrade or fix hardware if needed.	Ongoing		LMFSC PVFD HVFC	High	**O**
P-7	Blue Dot	Continue the Blue Dot Program, including outreach materials to let residents know about the program.	Ongoing		LMFSC PVFD	Medium	**O**
P-8	Road Safety Evaluations	Evaluate roads for access and maintenance issues.	Ongoing	USDA/CAL FIRE Humboldt County	LMFSC MRC PVFD HVFC	High	**O**
P-9	Addressing	Work on addressing driveways and homes.	Ongoing	Humboldt County/USDA/CAL FIRE	LMFSC/MRC PVFD HVFC	Medium	**O**
P-10	Emergency Communication	Integrate OES, NEST and Fire Department communication.	Identified	Humboldt County	LMFSC PVFD HVFC	High	**S**

Enhancing Fire Protection (P)

ID	Action Name	Description	Status	Possible Resources	Responsible Parties	Priority	Time line
P-11	Water Permit Process	Develop a streamlined permitting process for winter/spring diversion to water storage for domestic, agriculture, institutional, industrial, fire and other uses.	Identified	NCRWQCB	MRC LMFSC	Medium	**S**
P-12	Substation	Build PVFD Satellite Substation in the A.W.WAY area. - pending district annexation.	Identified		PVFD	High	D

Fire Ecology and Conservation/Restoration Efforts (R)

ID	Action Name	Description	Possible Resources	Who	Priority	Time line
R-1	Fuel Products	Determine the feasibility of using the products for fuels reductions/ thinning to generate income and produce a feasibility study for release to Mattole landowners.	USDA	MRC LMFSC	Low	**L**
R-2	Reduce Douglas-fir encroachment into historic grasslands	Remove DF with saws/heavy equipment to increase historic grassland range. Reduce ladder and horizontal fuels in remaining forest edge	USDA CAL FIRE	MRC BLM LMFSC	Medium	**O**
R-3	Prescribe Burns	Where appropriate and with CAL FIRE coordination, help landowners, public and private, restore fire to the landscape while providing training for local volunteers	BLM USDA CAL FIRE	CAL FIRE PVFD HVFD	Medium	**L**
R-4	Prairie Planting	Plant prairie burns with native grasses.	USDA BLM	MRC	Medium	**S**
R-5	Forest Density Reduction	Reduce forest densities to improve forest health, reduce fire hazard, improve ecological resilience to disturbance and pathogens, and improve habitat	USDA CAL FIRE	MRC	Medium	**D**
R-6	Reduce Invasive Brush Species	Where appropriate removed brush that is a fire hazard from historic prairie and forest edges	BLM USDA	MRC	High	**O**
R-7	Forest Info on Fuel Reduction	Improve knowledge of the long-term (2-10 years) effectiveness of fuel reduction projects and their effects in different forest types.	USDA CAL FIRE	MRC LMFSC	Medium	**L**

Community Emergency Preparedness and Planning (C)

ID	Action Name	Description	Status	Possible Resources	Responsible Parties	Priority	Timeline

C-1	Evacuation Routes	Development of possible evacuation routes for all neighborhood hubs in the CWPP area.	Identified	USDA CAL FIRE	LMFSC MRC PVFD HVFC	High	**O**
C-2	NEST expansion	Expand the NEST coverage area.	Identified	Humboldt County	LMFSC	High	**S**
C-3	Communication Integration	Integrate OES, NEST and Fire Department communication	Identified	USDA Hum County	LMFSC /MVCC PVFD HVFC		**S**
C-4	NEST Communication	Offer emergency training for NEST representatives.	Identified	Humboldt County	LMFSC MVCC	High	**S**
C-6	Evacuation Education	Offer educational resources on special evacuation scenarios, including for large animals	Identified	USDA County CAL FIRE	LMFSC PVFD HVFC	Mediu m	**S**

Reducing Fuels (MAT)

ID	Description	Location & Value at Risk	Project Type	Main-tenance	Funding Source	Respon-sible Parties	Pri ori ty	Time-line
PAC004	On watershed boundary, along Rainbow Ridge, maintained as northern border fire break/road, shaded fuel break	from 1N1W sec 36, SE ~6mi to 1S1E sec 14	Landscape		Grant Land-owner Assn.		12	
PAC005	On watershed boundary, along Rainbow Ridge, maintained as northern border fire break.	01S 01W sec 18; Rainbow Ranch Rd to 02S 01E sec 17	Road Side and Landscape				12	
MAT 046	Mill Creek / Mathews Ranch Road Shaded Fuel Break and Evacuation route	Mill Creek Rd/ Prosper Ridge Commun-ities	Other - Access	Some parts done, some more to do	Grant land-owner Assn. USDA	MRC LMFSC	15	O-par-tially funded 2014
MAT 050	Roadside Shaded Fuel Break Fox Springs Rd.	Wilder Ridge - Fox Springs Rd Neighbor-hood	Roadside Clearance	5yr Main-tenance	Grant land-owner Assn.		10	O-some clear-ing w/ PTHP
MAT 051	Stansberry Road Shaded Fuel Break	Stansberry Rd off of Wilder Ridge Rd	Roadside Clearance	5yr Main-tenance	Grant Land-owner Assn.	Land-owners	8	
MAT 054	Wilder Ridge Road Shaded Fuel Break	Wilder Ridge Neighbor-hoods	Roadside Clearance	Some done, some maintained Some still to do	Grant land-owner Assn. MRC	MRC Land-owners CCC	1 0	O
MAT 057	Doreen Drive Shaded Fuel Break going both S. (Heidi Ln) along the ridge and E. along ridge towards Dry Creek	Doreen Drive Neighbor-hoods	Roadside Clearance	4yr Main-tenance	Grant land-owner Assn. USDA CAL FIRE	LMFSC MRC Land-owners	13	D

Reducing Fuels (MAT)

ID	Description	Location & Value at Risk	Project Type	Main-tenance	Funding Source	Respon-sible Parties	Pri ori ty	Time-line
MAT 058	LIghthouse Road Shaded Fuel Break and Rd work to maintain as escape route	Lighthouse Rd./Prosper Ridge hoods	Roadside Clearance	3yr Maintenance - Roadside clearing	grant-landowner-Assn.	LMFSC MRC Landowners	10	O
MAT 060	Mattole/Bull Creek Road shaded understory clearance - perimeter of state park	Panther Gap	Roadside Clearance	Some done, some still need doing-5 year maintenance	grant-landowner-Assn. CCC CAL FIRE	CCC CAL FIRE	10	D
MAT 062a	Boots Canyon Road to Conklin Creek Rd shaded understory clearance	North of Conklin Creek Rd intersection	roadside clearance		USDA Cal FIRE	Landowners MRC	10	D
MAT 062b	Apple Ridgetop shaded fuel break from Boots Canyon Rd along ridge to Chambers Rd	Petrolia Conklin Creek Neighbor-hoods	landscape	5yr Maintenance		Landowners MRC LMFSC	5	
MAT 067	Roadside Shaded Fuel Break on Cooskie Ridge Rd. up to gate at top, across landscape Mat 077.	Green Fir - A.W. Way neighbor-hoods	Roadside Clearance	5yr Maintenance	Grant land-owner Assn. MRC	Landowners MRC LMFSC	10	D
MAT 068	Defensible Space around homesteads as needed	Petrolia Evergreen Way neighbor-hoods	Defens-ible Space	4yr Main-tenance	Title 3 USDA CAL FIRE FLASH	MRC LMFSC HVFC PVFD	12	O/D
MAT 069	Prosper Ridge, phase 3. To maintain existing meadows as a fuel break. MAT070 was	Prosper Ridge.	Ridgeline Fuel Break	5 yr Main-tenance	Grant Land-owner Assn. LMFSC	MRC Land-owners	5	O

Reducing Fuels (MAT)								
ID	**Description**	**Location & Value at Risk**	**Project Type**	**Main-tenance**	**Funding Source**	**Respon-sible Parties**	**Pri ori ty**	**Time-line**
	accomplished but will need maintenance							
MAT 071	Limbing and cleaning up of Eucalyptus grove near Mattole School and Community Center	Petrolia - Chambers Rd.	Roadside Clearance	3yr Maintenance	grant-Title 3.	MRC	13	O-partial-ly fund-ed 2016
MAT 072	Roadside fuel break on Mattole/Bull Creek Rd from Honeydew towards Part #1	Honeydew Neighbor-hoods	Roadside Clearance	5 yr maintenance	State (SRA) USDA	CAL FIRE CCC MRC	13	O-partially funded 2015
MAT 073	Roadside fuel break on Mattole/Bull Creek Rd from Honeydew towards Part #2	Windy Nip Neighbor-hoods	Roadside Clearance	4yr Maintenance	SRA	CCC CAL FIRE MRC	13	Treated 2015
MAT 074	Roadside fuel break on Mattole/Bull Creek Rd from Honeydew towards Part #3	Windy Nip Neighbor-hoods	Roadside Clearance	4 yr maintenance	SRA	CAL FIRE CCC	13	D
MAT 075	Shaded Fuel Break along Perimeter Rd. N. of main Mattole/Bull Creek Rd. separating State park from Humboldt Redwood Company	Windy Nip Neighborhood, park and timber lands	Roadside Clearance	4yr Maintenance	SRA	State Parks HRC	10	O-Parks has been proactive
MAT 076	Shaded fuel break end of Doreen Drive toward Mattole River, connects Mat 57	Ridge above Dry Creek	Landscape	5 yr maintenance	SRA, Grants Clearing house	LMFSC/ MRC	10	D

Reducing Fuels (MAT)

ID	Description	Location & Value at Risk	Project Type	Main-tenance	Funding Source	Respon-sible Parties	Pri ori ty	Time-line
MAT 077	Ridgetop Fuel Break BLM lands	Ridgetop between Indian and Four Mile Creeks	Landscape		Feds	BLM	10	D
MAT 078	North-South Shenanigan Ridgetop Fuel Break	Shenanigan Ridge to Mattole Road at Dump	Landscape	5 year Maintenan ce	SRA	CAL FIRE CCCs	10	D
MAT 080	From Mattole Rd along Fox Camp Rd connecting in with PAC004 and PAC005.						10	
MAT 081	Shaded understory - North Catheys Pk - Windy Nip tie, south end of PAC005 (in areas as needed)	sec 17 and 20 Rattlesnake Creek					7	
Non-Map	Work on communication between county road maintenance plans and LMFSC plans							
Non-Map	Fuels Reduction Evaluations - Evaluate all previous fuel reduction projects along Roads and major ridge tops							
Non-Map	Fuels Reduction Maintenance Program - Develop monitoring, maintenance protocols, funding, and agreements to ensure the long-term viability of fuel treatments							

Following up, and following through

Evaluating this CWPP will help determine to what extent this plan has been successful, and will strengthen implementation of future projects and CWPP updates.

Gathering Data

The following is a suggested list of information to collect that would help determine the effectiveness of this CWPP.

- What projects where completed that are listed in this plan? And how successful were they?
- What projects listed in this plan were not completed and why?
- Have the community priorities changed since this plan was implemented?
- How are the projects that were completed faring, and do they need follow-up treatments?

Evaluation

Determining if the Lower Mattole community has benefited from this CWPP is an important goal of this plan. The following is a suggested list of **questions for the local community**.

- Have you read at least part of the 2016 CWPP?
- Did the plan heighten your awareness of wildfire hazards in the Mattole?
- Has the plan helped you to participate in fuel reduction or emergency preparedness?
- Did you do any fuel reduction on your property?
- Did you do any controlled burning?

An important part of measuring the effectiveness of this plan is to determine its usefulness to the organizations that use it most. The following is a list of suggested **questions for organizations** involved in carrying out this plan.

- Has the plan helped with fundraising?
- Has the plan offered an adequate vision for planning?
- What projects have been completed?
- What projects have not been completed?
- What needs to be done to complete the projects that have not been completed?
- Is the Lower Mattole Valley closer to meeting the goals set forth for the Fire Plan?

Appendix A: References

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- www.suddenoakdeath.org

Appendix B: Resident Resources

Informational Resources Available Online:

At Home Risk Assessment [guide for assessing your home's ability to survive wildfire], located within the Humboldt County Community Wildfire Protection Plan: http://www.co.humboldt.ca.us/natural-resources/fire_safe_council/fireplan_docs/2012/appendixe_homeriskassessment.pdf

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

California Fire Safe Council: cafiresafecouncil.org/

Homeowner's Checklist [checklist for making the outside of your home fire safe], produced by CAL FIRE: http://www.fire.ca.gov/communications/downloads/fact_sheets/checklist.pdf

100' Defensible Space [flyer on maintaining defensible space], produced by CAL FIRE: http://www.calfire.ca.gov/communications/downloads/fact_sheets/DefensibleSpaceFlyer.pdf

Good Fire, Bad Fire [booklet on fire ecology], produced by the United States Department of Agriculture: http://csfs.colostate.edu/pdfs/Good_Fire_Bad_Fire.pdf

Humboldt County Fire Safe Council: humboldtgov.org/FireSafeCouncil

Incident Information System-InciWeb: inciweb.nwcg.gov

Joint Fire Science Program: firescience.gov

Northern California Prescribed Fire Council: norcalrxfirecouncil.org

Ready, Set, GO! Evacuation Planning [brochure on evacuation preparedness], produced by CAL FIRE: http://www.readyforwildfire.org/docs/files/CALFIRE_Set_Brochure.pdf

Ready, Set, GO! Wildfire Preparedness for Farmers, Ranchers, and Growers [brochure on wildfire preparedness for agriculturalists], produced by the Ventura County Fire Department: http://fire.countyofventura.org/LinkClick.aspx?fileticket=xDCkAK3DngE%3d&tabid=231

Wildland hazard and building codes [informational website], produced by CAL FIRE: HTTP://WWW.FIRE.CA.GOV/FIRE_PREVENTION/FIRE_PREVENTION_WILDLAND_CODES.PHP

Tanoak (*Lithocarpus densiflorus*)

Tanoak Ecology

Tanoak is a long-lived species capable of establishing beneath a full canopy of hardwoods or conifers. Once established, tanoak is extremely shade tolerant. Where tanoak dominates the stand the trees are large. In areas where they are growing in a mature conifer stand, they maintain a shrub like size.

Tanoak provides important habitat for numerous wildlife species. Tanoak habitats supply food and nesting sites for the northern flying squirrel, Allen's chipmunk, and dusky-footed woodrat. Mammals that feed on tanoak acorns include the black bear, black-tailed deer, Townsend chipmunk, California ground squirrel, and redwood chickaree. Acorns are also a source of food for birds such as the band-tailed pigeon, California woodpecker, and varied thrush.

Response to Fire

Tanoak is a fire-sensitive species. Aboveground portions are extremely susceptible to fire mortality. The thin bark provides little protection from heat, which usually kills the tree. As a result, low-intensity ground fires often kill tanoak seedlings and sapling-sized stems. Trees with thicker bark can survive low-intensity fires. Mortality is likely in young trees where wounds tend to heal over but allow entry of insects and diseases into the tree, eventually killing the tree. Tanoak is more susceptible to fire mortality when it occurs beneath a conifer overstory. Plants under these conditions are subject to more stress than when growing in a more open environment, and therefore less able to survive a fire.

Tanoak resprouts following fire via dormant buds located underground. Stored energy in the roots can aid in a rapid and aggressive post burn recovery. Resistance to low intensity burning is increased in older individuals where the bark may be from 1 to 3 inches thick.

Coyote Brush (*Baccharis pilularis*)

Coyote Brush Ecology

Coyote brush is a shade-intolerant species. It grows along eroding areas such as dunes and gravel bars and in open grassland areas. The rate of invasion is generally higher with a higher amount of spring rainfall, because wet springs maximize early root growth. Because seedling growth is poor in the shade, coyote brush does not regenerate under a closed shrub canopy. If fire and grazing are excluded, coyote brush will be replaced by more shade tolerant species.

Response to Fire

Coyote brush is moderately fire tolerant. In areas of high shrub density, there is not enough heat to completely kill the shrubs, and coyote brush is able to resprout. Fires that occur in areas with low shrub density and high herbaceous biomass create enough heat to kill plants. Fire is most detrimental to coyote brush when high temperatures are present at stem bases. These conditions girdle and kill roots. Conversely, fires with peak temperatures at canopy height only top-kill coyote brush. Coyote brush sprouts from the root crown and roots after top-kill by fire. If communities burn during recovery, coyote brush can be nearly eliminated, as sprouting ability is lessened with reburning.

Douglas-fir *(Pseudotsuga menziesii var. menziesii)*

Douglas-fir Ecology

Douglas-fir is a major, long-lived dominant of low and middle elevation moist forests. It is shade intolerant and requires openings to initiate seedlings. This species is extremely long-lived. Stands in the Mattole can be 300 to 350 years old but the dominant coverage is less than 100 years. On drier sites, Douglas-fir is more shade-tolerant.

Douglas-fir seedlings are not a preferred browse of black-tailed deer or elk, but can be an important food source for these animals during the winter. Douglas-fir seeds are an extremely important food for small mammals including mice, voles, shrews, and chipmunks. The seeds are also important in the diets of the winter wren, pine siskin, song sparrow, golden-crowned sparrow, white-crowned sparrow, red crossbill, dark-eyed junco, and purple finch.

Response to Fire

Douglas-fir can survive moderately intense fires. Thick, corky bark on the lower trunk of older trees and roots protects the tree from heat damage. In addition, the tall trees have their foliage concentrated on the upper trunk, which makes it difficult for fire to reach the crown; however, it should be noted that trees are typically not free of lower branches up to a height of 33 feet until they are more than 100 years old.

Crown fires commonly kill all trees over extensive areas. Hot ground fires that scorch tree crowns and char tree trunks kill variable proportions of Douglas-fir, especially younger trees. Douglas-fir often re-establish after a fire.

Canyon Live Oak (*Quercus chrysolepis*)

Canyon Live Oak Ecology

Canyon live oak is an important component of many young communities primarily because of rapid sprouting. Canyon live oak is long-lived, and shade-tolerant when young. As the stand ages, if it is out competed it can disappear from the community.

Canyon live oak provides important habitat for many animal species. Large oaks serve as perching, nesting, resting, or foraging sites for numerous species of birds and provide shade and cover for both large and small mammals. Small oaks provide cover and readily available browse. California oaks are important to shrews, bats, moles, rabbits, ground squirrels etc.

Response to Fire

Above-ground foliage of canyon live oak is sensitive to fire, and this plant is generally top-killed by fires of even relatively low intensity. Canyon live oak typically sprouts from the stump after the trunk or crown is damaged by fire. Because it frequently resprouts, stand turnover is generally minimal. Frequent fires tend to promote shrub like growth. The dead flaky outer bark is extremely flammable and can carry fire several feet up the trunk. The trunk appears to be sensitive to heat damage, which often extends up the trunk, far above any obvious signs of charring.

Younger plants and those with smaller stems and lower crown heights tend to be most vulnerable. Larger trees have relatively little dead fuel in the crown since leaf fall occurs in early summer prior to the fire season. The thicker bark of larger oaks provides some additional protection, as does the greater living mass that decreases overall flammability. Trunks of oaks, in general, are more seriously damaged by slower moving, lower intensity fires than those of higher intensity, but shorter duration.

Fire suppression efforts have increased Douglas-fir encroachment into oak stands that would normally be killed through periodic fire intervals. Left to grow, the Douglas-fir pose a threat to oaks that are shade intolerant.

Hairy Manzanita (*Arctostaphylos columbiana*)

Hairy Manzanita Ecology

Hairy manzanita grows in disturbed plant communities. It is commonly found in communities that develop after the removal of the forest overstory. It does not tolerate deep shade, and does not occur in closed canopy old-growth forest.

Black bear, coyote, black-tailed deer, and various small mammals and birds eat hairy manzanita fruit. The leaves and stems are inedible to browsing wildlife and livestock.

Response to Fire

Hairy manzanita usually does not survive a fire. However, fire activates hairy manzanita seed allowing it to germinate. Sprouting does not occur following fire or cutting.

Whitethorn (*Ceanothus leucodermis*)

Whitethorn Ecology

Whitethorn is most abundant in younger communities. This relatively short-lived, rapidly growing shrub disappears in stands that have not been burned for 40 to 70 years.

Whitethorn is a preferred food of many large animals. Fruits and seeds of whitethorn are used by many small mammals, birds, and insects.

Response to Fire

Whitethorn is largely dependent on fire for establishment. Without fire, this relatively short-lived shrub typically disappears within 40 to 70 years. Whitethorn exhibits numerous specialized adaptations to fire. Plants are capable of abundant seed production and, in many instances, sprout abundantly after fire. Seeds stored in the soil can apparently survive for decades until stimulated by heat to germinate in great numbers.

Whitethorn is highly flammable due to its growth form and chemical composition. This contributes to the huge, fast-moving fires so typical of chaparral. The lack of widespread seed dispersal, the apparent importance of seed banking, and its ability to resprout makes whitethorn particularly well adapted to persist following these sorts of large-scale fires.

Post fire mortality of mature whitethorn is typically slight following prescribed burns of light intensity. However, extremely hot fires often kill both young and mature plants.

Pacific Madrone (*Arbutus menziesii*)

Pacific Madrone Ecology

Pacific madrone can be subclimax or climax in successional status. It most commonly occurs as a codominant or intermediate tree in the mixed Douglas-fir/Tan Oak forests present in the Lower Mattole, although it is seldom present along the coast. Pacific madrone berries are an important food source for many birds and mammals. The berries are a particularly significant component in the diet of doves and pigeons during the fall. Deer eat the berries and also browse young shoots. Damage caused by animals is relatively minor on Pacific madrone. Live trees with rotten heartwood provide excellent habitat for cavity-nesting birds.

Seedlings establish best in partial shade, and young trees can survive in fairly dense shade. Top light is required for good growth; older trees may require top light to survive. Pacific madrone will grow toward openings, leaning as much as 15 to 20 degrees.

Response to Fire

Pacific madrone often dominates post-fire vegetation. During a fire, madrone's thin bark provides little protection from heat. Larger trees with thicker bark frequently survive light underburning. When young trees get injured after a burn, the scars tend to heal quickly. This

makes the trees more susceptible to insects and diseases entering the tree, which could lead to death.

Pacific madrone depends on periodic fire to control the conifer overstory. Following a fire, which kills stems, madrone sprouts vigorously through dormant buds located underground. Stored energy in the buds allow madrone to rapidly grow after a burn.

Redwood (*Sequoia sempervirens*)

Redwood Ecology

Redwood is a shade-tolerant to very shade-tolerant species. Redwood grows well even at an old age. Redwood forests provide habitat for variety of mammals, birds, reptiles, and amphibians. Remnant old-growth redwood stands provide habitat for the federally threatened spotted owl and the California-endangered Marbled Murrelet among other important species. Redwoods can sequester carbon better than any other living tree species and are important in cooling the coastal area due to the way they capture fog.

Response to Fire

Mature redwoods are considered very resilient to fire. The thick bark, great height, and ability to sprout from the root crown or from dormant buds are adaptations that allow redwood to survive cool to hot fires. After fires that destroy all aboveground portions, other mature and young redwoods will sprout from the roots; even seedlings have the ability to sprout after the above ground portions have been killed.

The effect of fire on redwood varies depending on the size of the tree. The bark of young trees is generally too thin to protect the tree from damage, and trees of this size are usually top-killed by cool to hot fires. The thick bark of mature redwood insulates the tree from the heat of the fire, and in many cases, fire may only reduce bark thickness.

Appendix D-Listed Species

See key to listed status at the end of list

Listed Salmonids

Scientific name	Common name	Listing status
Oncorhynchus mykiss	Steelhead trout	SC FT
Oncorhynchus kisutch	Coho salmon	SE FE
Oncorhynchus tsawytscha	Chinook salmon	ST FT

Other Listed Species

In addition to the Mattole's salmonids, our work will also benefit 55 other threatened, endangered, sensitive, and species of special concern that reside (at least potentially) within the watershed. Through protection and enhancement of the native habitats on which these species depend the proposed projects directly or indirectly benefit the following species:

Scientific name	Common name	Listing status
Fish		
Gasterosteus aculeatus	Threespine stickleback	FSS
Lampetra ayresi	River lamprey	FSC CDFS
Reptiles & Amphibians		
Actinemys marmorata marmorata	Northwestern pond turtle	G3, S3
Ascaphus truei	Tailed frog	SSC FSC
Rana boylii	Foothill yellow-legged frog	G3 S2 CDFG SC
Rhyacotriton variegatus	Southern torrent salamander	SS FSC
Mammals		
Antrozous pallidus	Pallid bat	SSC FSS BSS
Arborimus pomo	Red tree vole	CSS FSC
Taxidea taxus	Badger	CDFG SC
Martes americana humboldtensis	Humboldt marten	FSS
Martes pennant	Pacific Fisher	FSC CDFS
Birds		
Accipiter cooperii	Cooper's hawk	S3
Accipiter striatus	Sharp-shinned hawk	SSC

Ardea alba	Great egret	CDFS
Aquila chrysaetos	Golden eagle	SS
Brachyramphus marmoratus	Marbled murrelet	SE FT
Casmerodius albus	Common egret	CSS
Chaetura vauxi	Vaux's swift	SSC, FSC
Chondestes grammacus	Lark sparrow	FSC
Circus cyaneus	Northern harrier	SSC
Dendroica occidentalis	Hermit warbler	FSC
Dendroica petechia brewsteri	Yellow warbler	SE SSC
Elanus leucurus	White-tailed kite	FSC
Falco columbarius	Merlin	SSC
Haliaeetus leucocephalus	Bald eagle	SE FE
Junco hyemalis caniceps	Gray-headed junco	SSC
Nycticorax nycticorax	Black-crowned night heron	BSS
Pandion haliaetus	Osprey	SSC CDFS
Passerculus sandwichensis beldingi	Belding's savannah sparrow	SE
Progne subis	Purple martin	SSC
Selasphorus rufus	Rufous hummingbird	FSC SSC
Selasphorus sasin	Allen's hummingbird	FSC
Sphyrapicus ruber	Red-breasted sapsucker	FSC
Strix occidentalis caurina	Northern spotted owl	SS FT

Plants

Astragalus pycnostachyus	Coastal marsh milk vetch	G2 S2
Calamagrostis foliosa	Leafy reed grass	G3 S3
Castilleja affinis	Oregon coast paintbrush	S2.2 CNPS 2.2
Castilleja mendocinensis	Mendocino coast paintbrush	G2 S2.2
Clarkia amoena	Whitney's farewell to spring	S2.1 CNPS 1B.1
Erythronium oregonum	Giant fawn lily	S2.2 CNPS 2.2
Erythronium revolutum	Coast fawn lily	S3 CNPS 2.2
Gilia capitata	Pacific gilia	S2.2 CNPS 1B.2
Helminthoglypta arrosa monticola	Mountain shoulderband	G2 S1
Hesperevax sparsiflora	Short-leaved evax	S2 CNPS 1B.2
Lathyrus palustris	Marsh pea	S2 CNPS 2.2
Layia carnosa	Beach layia	G2 S2.1 CNPS 1B.1
Packera bolanderi	Seacoast ragwort	S1.2 CNPS 2.2
Piperia candida	White-flowered rein orchid	G3 S3.2 CNPS 1B.2
Polemonium carneum	Oregon polemonium	S1 CNPS 2.2

Sidalcea malachroides	Maple-leaved checker bloom	BSS G3 S3
Sidalcea malviflora	Siskiyou checkerbloom	S1.1 CNPS 1B.2
Sisyrinchium hitchcockii	Hitchcock's blue-eyed grass	G2 S1.1 CNPS 1B.1
Oenothera wolfii	Wolf's evening primrose	G1 S1.1 CNPS 1B.1

Key

SC	State Candidate	SSC	State Species of Concern
FSC	Federal Species of Concern	FSS	USDA Forest Service Special Species
ST	State Threatened	FT	Federal Threatened
SE	State Endangered	FE	Federal Endangered
CSS	California Special Species	CDFS	CA Dept of Fish & Game Sensitive
BSS	BLM Special Species		

California Native Plant Society (CNPS):

1B.1	Plants rare, threatened, or endangered in CA or elsewhere (seriously threatened in CA)
1B.2	Plants rare, threatened, or endangered in CA or elsewhere (fairly threatened in CA)
2.2	Plants rare, threatened, or end. in CA, more common elsewhere (fairly threatened in CA)

California Department of Fish and Game, Natural Diversity Database (CNDDB):

S1	Critically imperiled subnationally
S1.1	Critically imperiled subnationally, seriously endangered in CA
S2	Imperiled subnationally
S2.1	Imperiled subnationally, seriously endangered in CA
S2.2	Imperiled subnationally, fairly endangered in CA
S3	Vulnerable subnationally
S3.2	Vulnerable subnationally, fairly endangered in CA
G1	Critically imperiled globally
G2	Imperiled globally
G3	Vulnerable globally

APPENDIX E

Glossary of Fire Behavior Terms

The following sections on common fire behavior terms have been adopted from the Santa Monica Mountains CWPP.[37]

Surface Fire

Surface fires primarily consume ground-level fuels, including shrub and grass vegetation, organic litter, and the soil duff layer. Surface fires may advance quickly with short or long residence time and a range of heat output. During milder conditions, surface fires in shrub systems do not always remove all the vegetation, only that which is very dry or exposed to high fire intensity. Surface fires respond to fire-suppression efforts except in extreme fire weather like strong wind events. Surface fires typically occur in grasslands and oak woodlands.

Crown Fire

Crown fires consume the *canopy* of the uppermost vegetation layer. The fire does not remain on the surface but climbs into the tops of the trees, with large flame lengths and high fire intensity. The term is most often used to refer to fires in forests. Crown fires are of high intensity, with high heat output and long flame lengths, which challenge suppression efforts. Crown fire initiation (or *torching*) occurs when ladder fuels are present (so-called because of their location and position, enabling them to conduct fire from the surface into the canopy), providing a connection between the surface fuels and the crown fuels. The higher the base of the canopy (i.e., the further away from surface fuels), the more difficult it is for crown fires to ignite. Once fire reaches the vegetation canopy, whether in sage scrub, chaparral, or forest, its spread is more likely in dense canopies and with high wind speeds and/or steep slopes. When a crown fire occurs, countless embers (or sparks) are produced and distributed, sometimes over long distances, especially during high wind events. These embers can start new fires (spot fires), which can each grow and confound any fire-suppression forces. In landscaping near homes, fire behavior may be reduced by selectively removing ground-layer vegetation and ladder fuels. It is harder for surface fires to reach into the canopy and become crown fires if the vertical arrangement of fuels is separated by ladder-fuel removal. This is the main goal of many fuel-reduction treatments.

[37] Santa Monica CWPP, 2010 Forever Green Forestry forevergreenforestry.com

Fire Intensity

Fire intensity describes the amount of heat that is released from flaming combustion in a specific area and unit of time (BTU/ft/sec).[18] This measurement captures the energy of a fire in the flaming front; it is often confused with fire severity, a term describing fire effects on vegetation or soils (see below). Fire intensity is used in fire prediction and modeling to determine the most effective control strategy. Firefighters can only work adjacent to flame lengths with an intensity low enough not to burn the shin. Fire intensity increases with heavy fuel loading, continuous fuel arrangement, strong winds, and low *fuel moisture*.

Heat Per Unit Area

Heat per unit area is the measurement used to define the total heat produced from flaming combustion in any one location, quantifying the amount of heat energy released (BTUs) from fuel covering a square foot of ground during the passage of the flaming front. This does not include long *burn-out times* and smoldering. This factor is especially important in determining soil heating and is a predictor of potential root damage and *cambium* heating, all indicators of fire severity for many tree species.

Fire Severity

Fire severity describes the effects from a fire, as measured by the amount of organic matter combustion caused by the fire. It is determined by soil damage, extent of tree canopy mortality, or in shrub vegetation, amount of residual aboveground vegetation. Fire severity is assessed by observing vegetation and soil conditions after a fire, often in comparison with pre-fire vegetation or soil conditions. The relationship between predicted fire behavior characteristics (flame length, heat per unit area, *fireline intensity,* etc.) and fire severity is being explored but is not yet well established. Long flame lengths, large amounts of torching, crown fire presence, high fireline intensity, and high heat per unit area are all indicators of potentially severe fires. Higher or lower severity can be distinguished based on the amount or size of aboveground organic material (e.g. charred branches, organic soil layers) remaining following fire. This distinction can be important in estimating post fire vegetation recovery, as many ecosystem components (e.g. seed banks, re-sprout survival, and invasion by exotics) have been associated with different fire severity levels. The coastal Douglas-fir forests of the Lower Mattole are not well adapted to high-intensity, especially those that are crown fires.

Flame Length

Flame length measures the span of the flame from the tip to the base, irrespective of its tilt. This factor is the greatest influence on the probability of structure damage and ease of fire suppression. Flame length is highly correlated with fire intensity, which can sometimes help predict fire severity. In general, hand crews can safely and effectively make direct attacks on fires where flame lengths are less than 4 feet. When flame lengths exceed 4 feet, hand crews

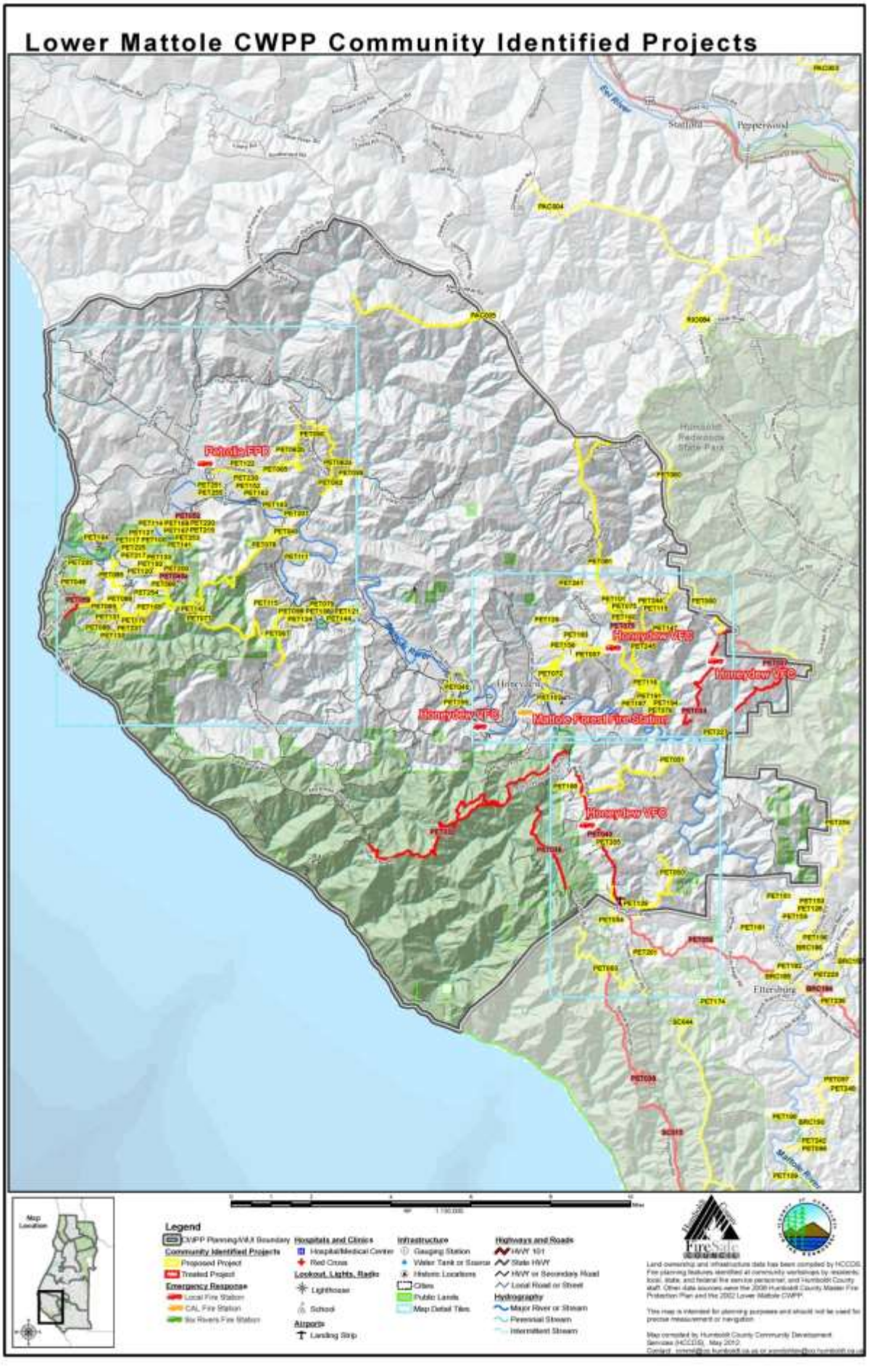
usually resort to indirect attack methods. Bulldozers can generally make safe and effective direct attacks on fires with flame lengths up to 12 feet. Flame lengths longer than 12 feet generally cannot be safely or effectively controlled by direct attack. Fuel-management projects are intended not to stop fire but to reduce flame lengths, creating new opportunities for firefighters to safely and effectively use direct attack methods to limit fire spread. Fuel-management goals aim for production of flame lengths less than 4 feet, especially near homes and structures.

Rate of Spread

The rate of spread is a measurement of how rapidly the *leading edge* of a fire advances. When the rate of spread is faster than fireline-building capacity it is challenging to fire suppression efforts. High spread rates also indicate the potential for quick changes in fire spread direction, which could endanger firefighters and increase damage. High rates of spread in grass can exceed 300 feet per minute. In crown fires, rates of spread can exceed 100 feet per minute. When wildfires occur in extreme fire weather, embers commonly cause many spot fires ahead of the main flaming front. Spot fires can greatly increase the overall rate of fire spread. When weather becomes more moderate, fire spread slows and firefighters are able to begin effectively containing it.

Residence Time

The residence time of a fire defines how long a fire burns in any one location. Usually grass fires are consumed quickly and have a short residence time (e.g. 30 seconds), in contrast to the residence time of fires in deep duff layers, which can burn for hours. Foliage and *suspended dead material* are usually consumed in less than 90 seconds. Residence time is useful in predicting tree mortality, seed bank mortality, and the potential to damage structures.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Petrolia FPD
Honeydew VFD
Honeydew VFD
Honeydew VFD
Honeydew VFD
Mattole Forest Fire Station
Petrolia
Honeydew
Ettersburg
Humboldt Redwoods State Park
Stafford
Peppermill
Eel River
Mattole River
Legend
CWPP Planning/WUI Boundary
Community Identified Projects
Proposed Project
Treated Project
Emergency Response
Local Fire Station
CAL Fire Station
Six Rivers Fire Station
Hospitals and Clinics
Hospital/Medical Center
Red Cross
Lookout, Lights, Radio
Lighthouse
School
Airports
Landing Strip
Infrastructure
Gauging Station
Water Tank or Source
Historic Locations
Cities
Public Lands
Map Detail Tiles
Highways and Roads
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Hydrography
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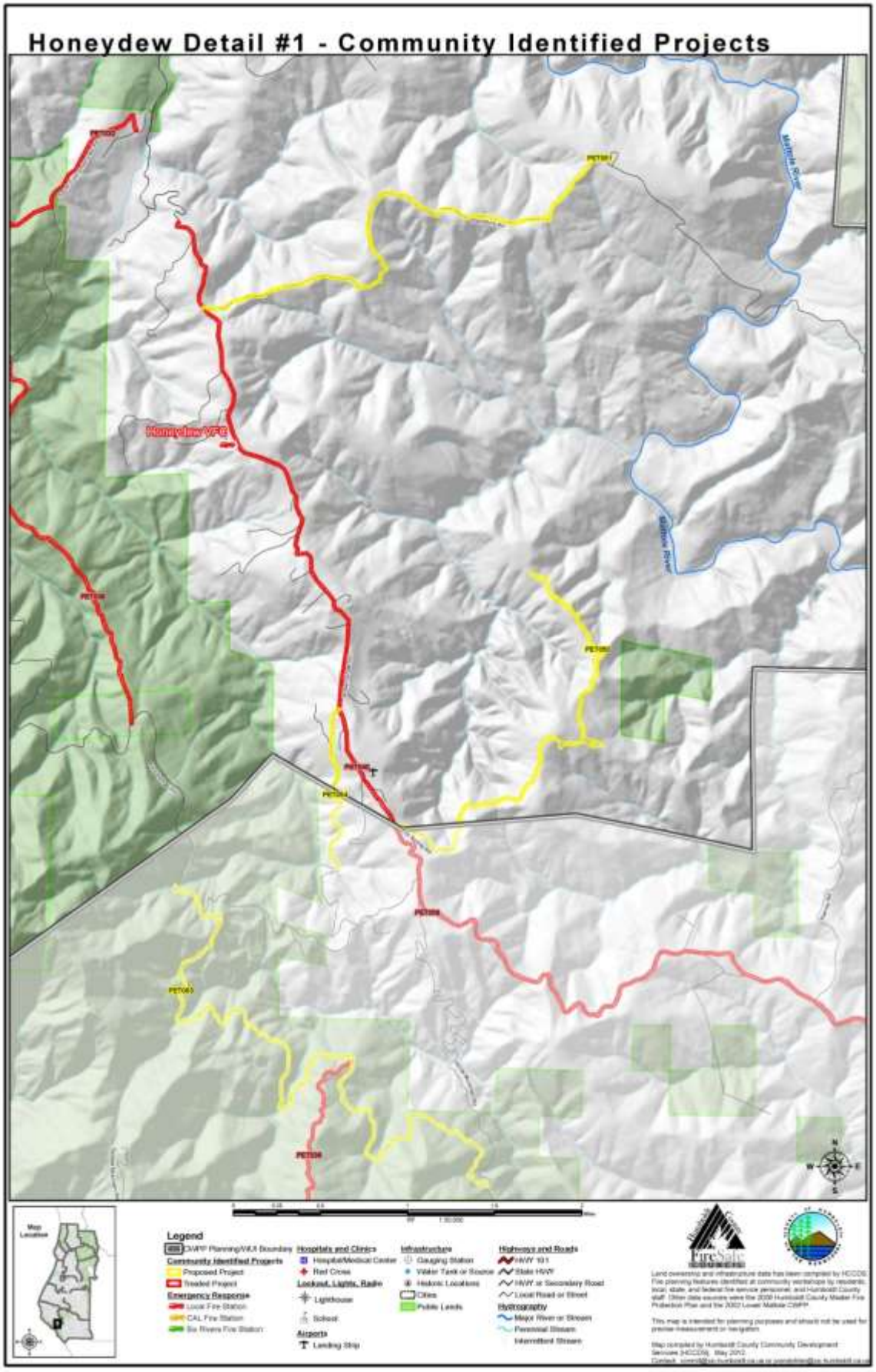
Honeydew Detail #1 - Community Identified Projects
Honeydew VFC
PET002
PET001
PET004
PET005
PET006
PET007
PET008
PET009
PET010
Mattole River
Bailey River
Legend
CWPP Planning/WUI Boundary
Community Identified Projects
Proposed Project
Treated Project
Emergency Response
Local Fire Station
CAL Fire Station
Six Rivers Fire Station
Hospitals and Clinics
Hospital/Medical Center
Red Cross
Lookout, Lights, Radio
Lighthouse
School
Airports
Landing Strip
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Gauging Station
Water Tank or Source
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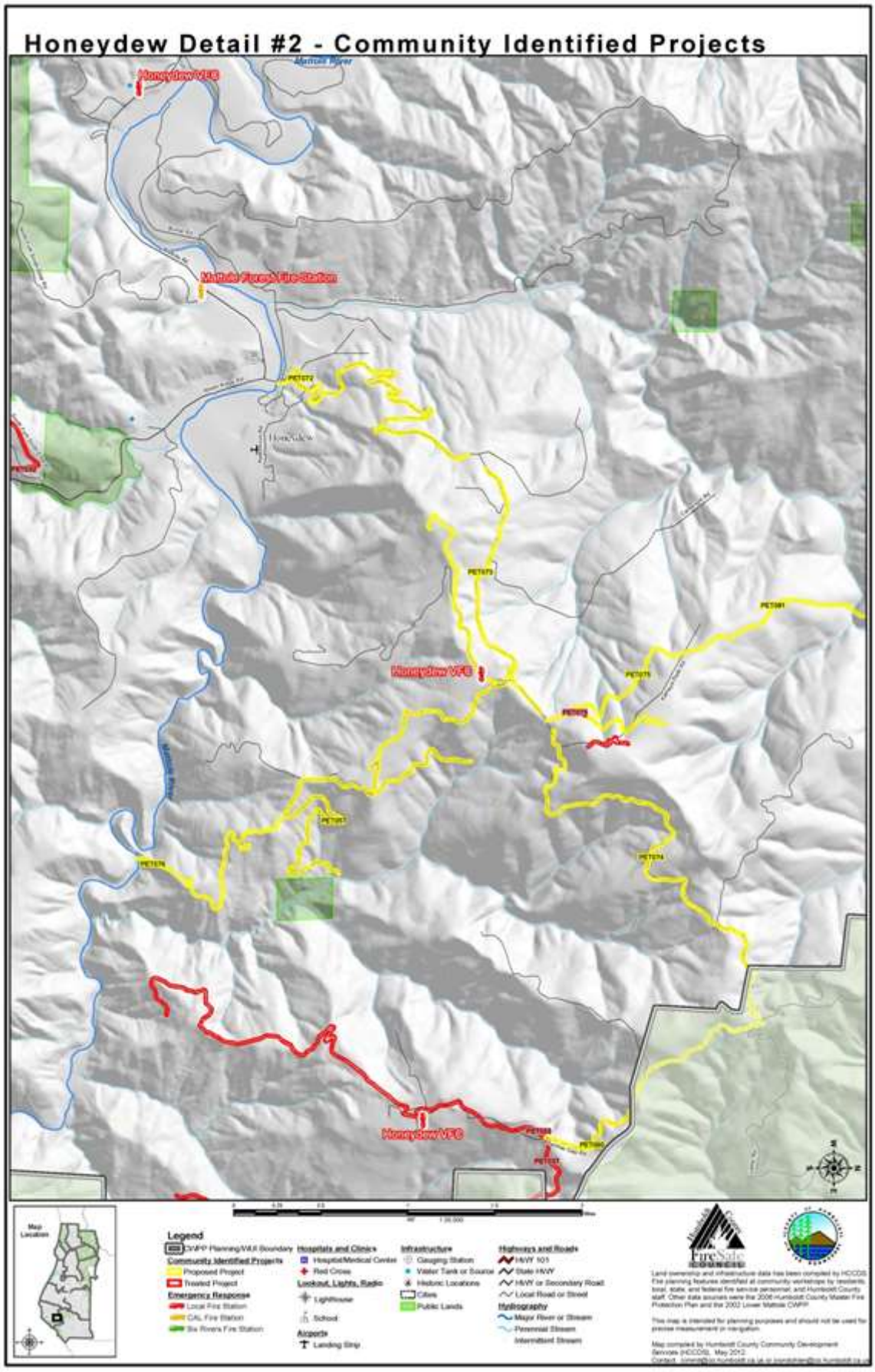
Honeydew Detail #2 - Community Identified Projects
Honeydew VFD
Mattole Rangers Fire Station
PET072
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PET079
PET080
PET081
Legend
CWPP Planning/WUI Boundary
Community Identified Projects
Proposed Project
Treated Project
Emergency Response
Local Fire Station
CAL Fire Station
Six Rivers Fire Station
Hospitals and Clinics
Hospital/Medical Center
Red Cross
Lookout, Lights, Radio
Lighthouse
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Airports
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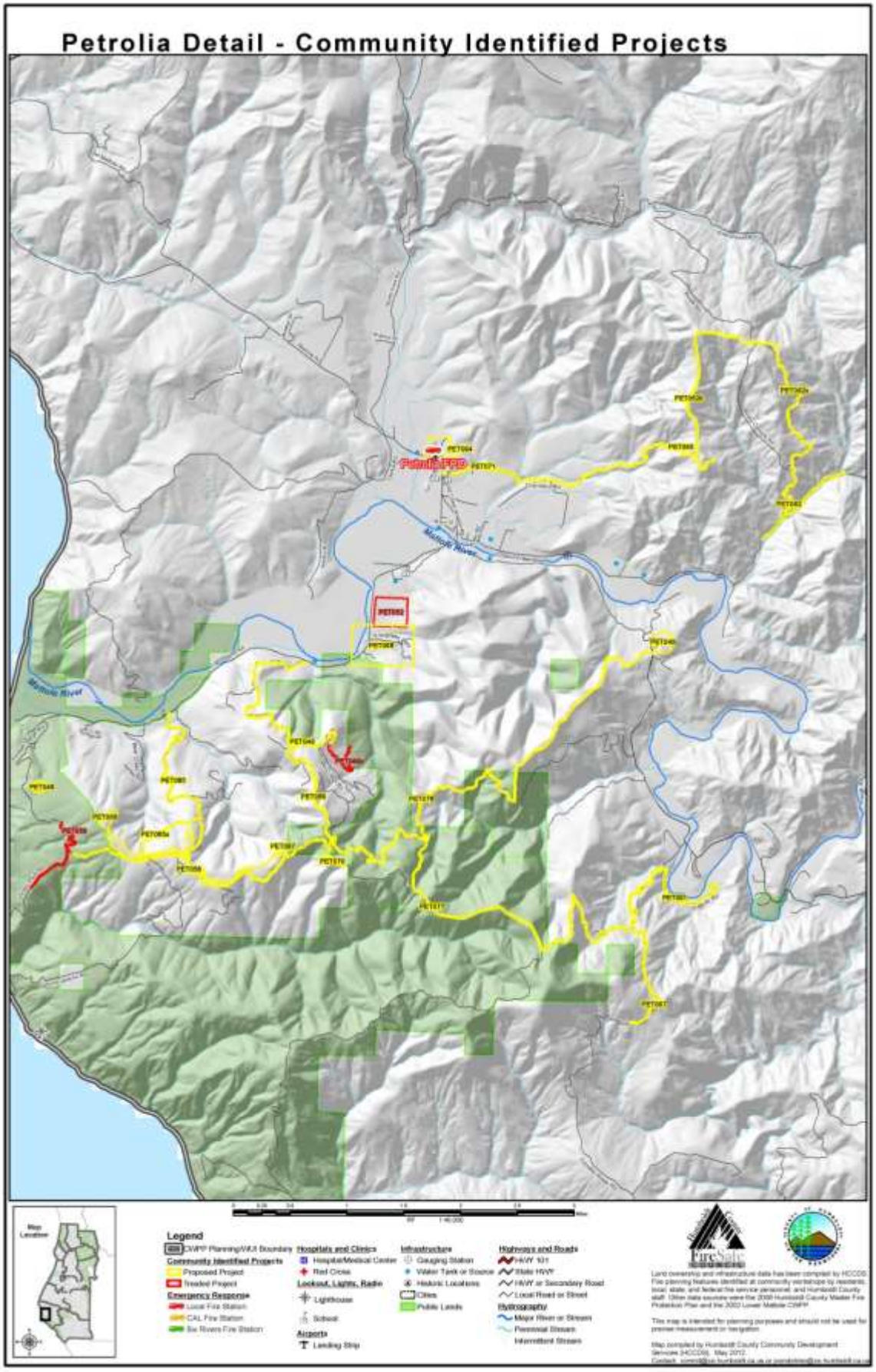
Petrolia Detail - Community Identified Projects
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Hospitals and Clinics
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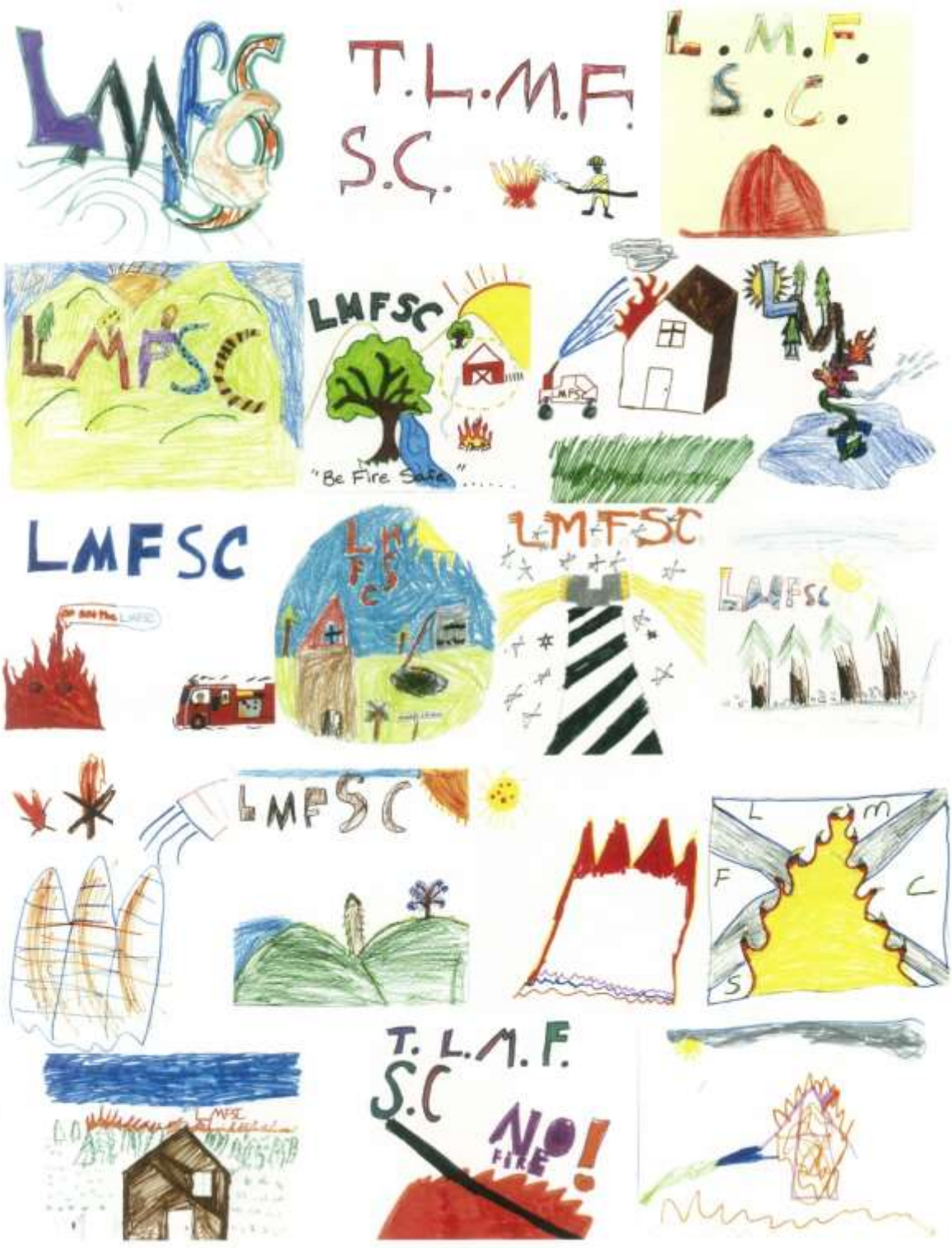
Intermittent Stream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NO!
FIRE