Humboldt County
Community Wildfire Protection Plan



2013 UPDATE

HUMBOLDT COUNTY COMMUNITY WILDFIRE PROTECTION PLAN
2013 UPDATE

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Humboldt County Community Wildfire Protection Plan Certification and Agreement

The Community Wildfire Protection Plan developed for the County of Humboldt:

- Was collaboratively developed. Interested parties and federal land management agencies managing land in the vicinity of Humboldt County have been consulted.

- This plan identifies and prioritizes areas for hazardous fuel reduction treatments and recommends the types and methods of treatment that will protect Humboldt County Communities.

- This plan recommends measures to reduce the ignitability of structures throughout the area addressed by the plan.

The following entities attest that the standards listed above have been met and mutually agree with the contents of this Community Wildfire Protection Plan:

_____

Chairperson,
Humboldt County Board of Supervisors

_____

Chairperson,
Humboldt County Fire Safe Council

_____

Unit Chief,
California Department of Forestry and Fire Protection
Humboldt-Del Norte Unit

_____

President,
Humboldt County Fire Chiefs' Association

Humboldt County Community Wildfire Protection Plan

ACKNOWLEDGEMENTS

The Humboldt County Community Wildfire Protection Plan is written as a resource guide for residents and communities of Humboldt County. It is designed to help residents become informed about, plan for, and prepare their properties for wildfire in a way that decreases their risk of loss and increases their chances of survival.

In the spirit of collaboration, the following people and organizations contributed to the completion of this Plan and/or had a role in the Community Wildfire Protection Plan certification process:

Humboldt County Residents:
All community members who attended fire planning workshops and contributed their local knowledge to the process.

Humboldt County Fie Safe Council
All members past and present who dedicated hours of their time to contribute to the development of this plan.

County of Humboldt:
Leadership:
The Humboldt County Board of Supervisors and Staff:

- Cybelle Immitt, Public Works
- Dan Larkin, Office of Emergency Services
- Danielle Allred, Public Works
- Jerry von Dohlen, Planning and Building, GIS
- John Miller, Planning and Building
- Todd Sobolik, Planning and Building

Local Fire Safe Councils

- Crooked Prairie FSC
- Lower Mattole FSC
- Orleans/Somes Bar FSC
- Southern Humboldt FSC
- Van Duzen Watershed FSC
- Willow Creek FSC

Humboldt County Fire Chiefs Association
Particular support for community meetings received by:

- Nathan Falk, Willow Creek Fire
- John MacFarland, Arcata Fire
- Rick Harden, Kneeland Fire
- Lon Winburn, Fortuna Fire
- Tom Grinsell and Daniel DelBiaggio, Ferndale Fire
- Ken Nielson and Jeff Robinson, Loleta Fire
- Shane Wilson, Rio Dell Fire
- Tim Smith, Bridgeville Fire
- Paul Rosenblatt, Westhaven Fire

CAL FIRE

- Battalion Chiefs Bob Ellis, Mark Rodgers, Jonni Mayberry, and Tom Nix
- Hugh Scanlon, Battalion Chief
- All of the firefighters who attended numerous public workshops

Six Rivers National Forest Service

- Amy Ziegler
- Robert Rivelle

Redwood National and State Parks

- Rick L. Young

Community Workshop Speakers

- Linda Nellist, Judy Sears, and Judy Warren, Regional Training Institute-Community Disaster Preparedness, Office of Extended Education, Humboldt State University
- James Erler, Forestry Director, Yurok Tribe Forestry
- Jim Adams and Mike Alcorn, Green Diamond Resource Company
- Bryan Buckman, City of Trinidad, Public Works
- Mark Andre and Dennis Houghton, City of Arcata

Community Workshop Hosts

- Green Point Elementary School
- Kneeland School
- Trinity Valley Elementary School
- Fieldbrook Elementary School
- Yurok Tribal Council (Weitchpec Community Center)
- Hoopa Tribal Council
- Bayside Grange
- Redwood Acres Fairgrounds
- Healy Senior Center
- Westhaven Fire Department
- Fortuna Fire Department
- Mattole Community Center
- South Fork High School
- Bridgeville Community Center
- Mid Klamath Watershed Council, Panamnik Building
- Orick Community Hall

Humboldt County Community Wildfire Protection Plan

The Humboldt County Board of Supervisors supported this plan update process through the allocation of funding from Title III of the Secure Rural Schools and Community Self-Determination Act.

PLEASE COMMENT ON THIS DOCUMENT

Although a large number of people were involved in the community input process, not everyone was able to participate. Comments will continue to be useful because this plan is intended to be a living document. Community wildfire protection planning is an evolving process and will never truly be "done". New comments will be incorporated into the next plan update.

Please email your comments to: cimmitt@co.humboldt.ca.us.

Cybelle Immitt
County of Humboldt Public Works
Natural Resources Planning Division
1106 Second Street
Eureka, CA 95501

Part I. Background and Introduction

Overview

This document constitutes a comprehensive update to the 2006 Humboldt County Master Fire Protection Plan (MFPP). In 2006, the County Board of Supervisors (BOS) certified that the MFPP met the standards of the 2003 *Healthy Forest Restoration Act* (HFRA) as a *Community Wildfire Protection Plan* (CWPP), and accepted the MFPP as a technical background study and support document for the Humboldt County General Plan Update (GPU). At that time, the Plan was also certified as a CWPP by the California Department of Forestry and Fire Protection (CAL FIRE) and the Humboldt County Fire Chiefs' Association. With the preparation of the MFPP, the County significantly broadened its role in fire planning and support for *wildfire mitigation* activities.

This update to the MFPP has been prepared at the direction of the BOS and under the guidance of the Humboldt County *Fire Safe Council* (HCFSC). Funding for this update was provided by the Secure Rural Schools and Community Self-Determination Act, Title III. For the sake of consistency with the terminology used in the HFRA, this update to the MFPP is named the Humboldt County Community Wildfire Protection Plan.

The first chapter within Part I is an **Introduction** that orients the reader to the planning area as well as the goals and objectives of the Plan. This chapter also provides an overview of how the entire plan is organized. Chapter I.2 discusses the **Plan Context** as it relates to the original concept of CWPPs born out of the 2001 National Fire Plan and the HFRA. Each criterion used to certify a fire plan as a CWPP is evaluated in this chapter. The more recent national and state fire-planning policy is also introduced in this chapter.

Chapter I.3 explains the **Planning Process** and the role of the HCFSC. Details are provided about the extensive community outreach and public participation efforts that took place in order to gather local knowledge regarding wildfire concerns and recommendations. Public participation was centered around a series of community workshops. The purpose of these workshops was to educate residents about fire safety as well as to seek information and participation from them regarding *fire hazards* in their communities, in order to effectively update and implement this CWPP.

Chapter I.4 contains the **2006 Plan Implementation Progress Review**. This chapter examines the development of fire-safety improvements throughout the County by revisiting priority project goals and recommendations listed in the 2006 MFPP and exploring the progress that has been made in achieving these goals. Each section discusses the steps that have been taken towards implementing projects that advance the following fire-safety priorities:

- *Fuel Modification/Biomass Utilization*
- Develop a Reliable Revenue Source for *Fire Protection*
- Develop a *Level of Service Standard*
- Improve *Emergency Dispatch* Services
- MFPP Policy Recommendation Integration into the General Plan Update
- *Fire-Safe* Education
- Fire-Safe Planning and Hazard Identification

Humboldt County Community Wildfire Protection Plan

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I.1. Introduction

I.1.1. Community Wildfire Protection Plan Purpose, Goals, and Objectives

CWPP Purpose

The Humboldt County Community Wildfire Protection Plan (CWPP) is intended to serve as the guiding document for reducing the risk of wildfire to Humboldt County communities, and to serve the following purposes:

- Prioritize wildfire mitigation projects to inspire future action and increase competitive advantage for funding;
- Educate residents regarding their level of risk to wildfire, how to reduce *structural ignitability* and other fire hazards in the *Home Ignition Zone*, and what to expect from fire protection service;
- Encourage Humboldt County residents to take responsibility for reducing *wildfire risk* to their homes and properties;
- Build capacity of local fire organizations—both *fire departments* and *Fire Safe Councils* (FSCs);
- Coordinate the activities of the local, state, tribal, and federal entities charged with fire protection and management responsibilities;
- Facilitate the incorporation of planning for *fire-safe/Firewise* communities into the County land-use planning process; and
- Identify funding sources to support organizations that provide *fire prevention* and protection services.

CWPP Goals

Goal 1. Fire Protection Capability – Assure adequate fire protection for people, property, communities, and natural resources.

Goal 2. Fire Safe Education – Promote fire-safe/Firewise planning, *fire-safe standards*, and fire-education programs addressing *fire risk* in Humboldt County.

Goal 3. Risk and Hazard Assessment – Encourage effective and risk-based allocation of fire prevention and suppression services and resources.

Goal 4. Risk Reduction and Management – Encourage countywide efforts to reduce or modify *hazardous fuel loads* for community protection and wildfire prevention, and promote measures that residents and communities can implement to reduce their vulnerability to loss from wildfire.

Goal 5. Community Preparedness and Response – Support efforts of fire-protection organizations and FSCs to maintain adequate staffing levels and to serve as public safety agents.

Goal 6. Fiscal Issues – Support the fire prevention and resource protection efforts of communities, FSCs, special districts with fire-safety responsibilities, fire organizations, tribes, and Joint Powers Authority (JPA) cooperative services, including *dispatching*, *hazardous materials (HazMat)*, training, and other cooperative opportunities.

CWPP Objectives

Objectives are statements of desired future conditions assuming that all goals are achieved. The core objectives for this plan are:

- Adequate fire-protection service and FSC support available to all Humboldt County communities;
- Adequate funding for fire-protection organizations and FSCs;
- Broad-based participation in CWPP implementation and maintenance, and Firewise Communities recognition (FSCs, fire departments, and property owners);
- Clearly mapped community assets, wildfire risks, potential mitigation projects, and fire *protection resources*;
- Successful completion and maintenance of priority hazardous *fuel reduction* projects (*prescribed burning*, *manual* and *mechanical thinning treatments*, *chipping*, etc);
- Federal, tribal, state, and local agencies and organizations cooperating to provide community wildfire prevention education;
- Increased number of residents with a basic understanding of fire safety and the home ignition zone who take appropriate action to reduce their vulnerability to loss from wildfire; and
- Cooperation between citizens, community-based organizations, and government to protect communities.

I.1.2. Plan Organization

This CWPP is organized into five parts. Part I. Background and Introduction, describes the planning-area context, the process used to develop this CWPP, and an update/progress report on the actions implemented since the 2006 version (Humboldt County Master Fire Protection Plan or MFPP). Part II. Risk Assessment, is a qualitative assessment of the various factors that contribute to wildfire in Humboldt County. Part III. Countywide Action Plan lists the mitigation measures proposed in this CWPP to reduce the risk to Humboldt County residents and environment from the destructive effects of wildfire. Part IV. Planning Unit Action Plans, contain a mini-CWPP for each of the thirteen *planning units* used in this process. Each contains a brief introduction to the planning area, discusses its wildfire environment, community preparedness, wildfire protection capabilities, evacuation issues and options, and then a list of proposed actions. Part V. Fire-Safe Communities, is written for Humboldt County residents to help them better co-exist with the eventuality of wildfire.

Important Reading for Humboldt Residents

Part IV. Planning Unit Action Plans contains a wide range of useful, localized information on fire risks and preparedness specially tailored to each of the thirteen Planning Units within Humboldt County. These individualized Planning Unit Action Plans can act as resources for local residents and may even be used as the basis for a local CWPP or as a resource for the development of Firewise Assessments!

Part V. Fire-Safe Communities is an excellent resource for home and property owners in Humboldt County. It was designed as a stand-alone guide, independent of the rest of the CWPP. This section serves as a useful handbook for homeowners who want to take action to prepare their families, homes, and surrounding landscapes to successfully co-exist with wildfire. Finally, it contains resources for enhancing fire-safety awareness, and advice on how to meet local and state legal standards while fortifying your home and property against wildfire.

A set of Appendices follows these main Parts with background and supporting information. A Glossary is also included, which supplies definitions for the *italicized words* located throughout

the Plan chapters. The first time each Glossary term appears in the Plan it is *italicized*, indicating that its definition can be found in the Glossary. A list of all the Acronyms utilized throughout the Plan is also available in the Appendices.

The following lists each Part by name and the chapters contained within the Part.

PART I - Background and Introduction

I.1. Introduction
I.2. Plan Context
I.3. Planning Process
I.4. 2006 Plan Implementation Progress Review

PART II - Risk Assessment

II.1. Wildfire Environment
II.2. Values and Assets at Risk
II.3. Wildfire Protection Capabilities
II.4. Community Preparedness
II.5. Risk Assessment Summary

PART III - Countywide Action Plan

III.1. Enhancing Fire Protection: Helping Firefighters Protect the Community
III.2. Creating Fire-Safe Communities: Empowering Residents to Take Responsibility
III.3. Hardening Homes to Survive Wildfire: Reducing Structural Ignitability
III.4. Encouraging and Implementing Defensible Space Throughout Humboldt County
III.5. Reducing Hazardous Fuels Throughout Humboldt County
III.6. Ensuring Safe and Effective Evacuation
III.7. Enhancing Emergency Notification and Communications
III.8. Preparing Humboldt Communities for Emergencies
III.9. Promoting Fire-Safe Education
III.10. Designating Communities at Risk
III.11. Designating Wildland-Urban Interface Areas
III.12. Integrating Fire-Safety Actions with Local Regulations and Policy
III.13. Maintaining Air Quality
III.14. Utilizing Excess Fuels
III.15. Implementing and Maintaining this CWPP

PART IV - Planning Unit Action Plans

IV.1. Redwood Park
IV.2. Up River
IV.3. East Klamath
IV.4. Hoopa
IV.5. Trinidad
IV.6. Redwood Creek
IV.7. Trinity
IV.8. Eureka Plain
IV.9. Kneeland-Maple Creek
IV.10. Eel
IV.11. Mad-Van Duzen
IV.12. Mattole-Lost Coast
IV.13. Southern Humboldt

PART V - Fire-Safe Communities

V.1. From the House Out
V.2. Ready, Set, Go!
V.3. After the Fire

V.4. Legal Requirements

PART VI – Appendices

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Appendix B: Glossary
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Appendix D: Mapping Exercise Instructions
Appendix E: Home Risk Assessment
Appendix F: County Fire Safe Standards
Appendix G: Descriptive Characteristics for Community Identified Projects Matrix
Appendix H: Humboldt County Fire Safe Regulations Checklist
Appendix I: Emergency Water Supply Systems
Appendix J: CAL FIRE Evacuation Tips
Appendix K: Public Resource Code (PRC) 4291

I.1.3. Introduction to the Planning Area: Humboldt County

The planning area for this CWPP includes all of the area within the boundaries of the County of Humboldt. At 3,570-square miles, Humboldt County is the 14th largest county in California. Nearly 34 percent of the county is either in public ownership or tribal lands. Incorporated cities occupy 23,011 acres, or just under one percent of the total land area. The National Forests, National Parks, and public land managed by the Bureau of Land Management (BLM) total 571,200 acres; the State Parks system encompasses 72,200 acres. The Yurok and Hoopa tribal lands total 127,512 acres, or 5.6 percent of the total land area in the county. Unincorporated lands subject to the County's land-use jurisdiction (areas outside cities, and federal, state, and tribal trust lands) total approximately 1,565,000 acres.

Timberland and agriculture account for the majority (60%) of the county's unincorporated rural land uses, including approximately 1,009,000 acres of Timberland Production Zone (TPZ) and 283,000 acres in Williamson Act agricultural preserves. Open space and parks occupy nearly 582,900 acres, representing 26%, and all other uses share 14% of Humboldt County's total land area, including *rural residential* as a primary use on 112,459 acres in the unincorporated county. Single-family residential lands (including mobile homes and mobile-home parks) cover 4,827 acres; an additional 611 acres are designated multi-family housing.

Humboldt County is among California's northernmost counties, serving as a gateway to the vast temperate rainforests of the Pacific Northwest and alternatively to the legendary California wine country to the south (*see Figure I.1-1. CWPP Planning Area Map*). The County's strikingly rugged coastline spans approximately 100 miles and includes Cape Mendocino, the westernmost portion of the continental United States. Offshore is an area of intensive ocean upwelling and rich marine productivity. It is also an area where three tectonic plates converge, creating one of the most seismically active areas in the world, known as the Triple Junction. The sheltered waters of Humboldt Bay serve as an economic focal point, functioning as the principal port and a center of commerce. It is also a significant natural resource area featuring extensive wetlands, fertile bottomlands, and wildlife *habitat*, including the Humboldt Bay National Wildlife Refuge.

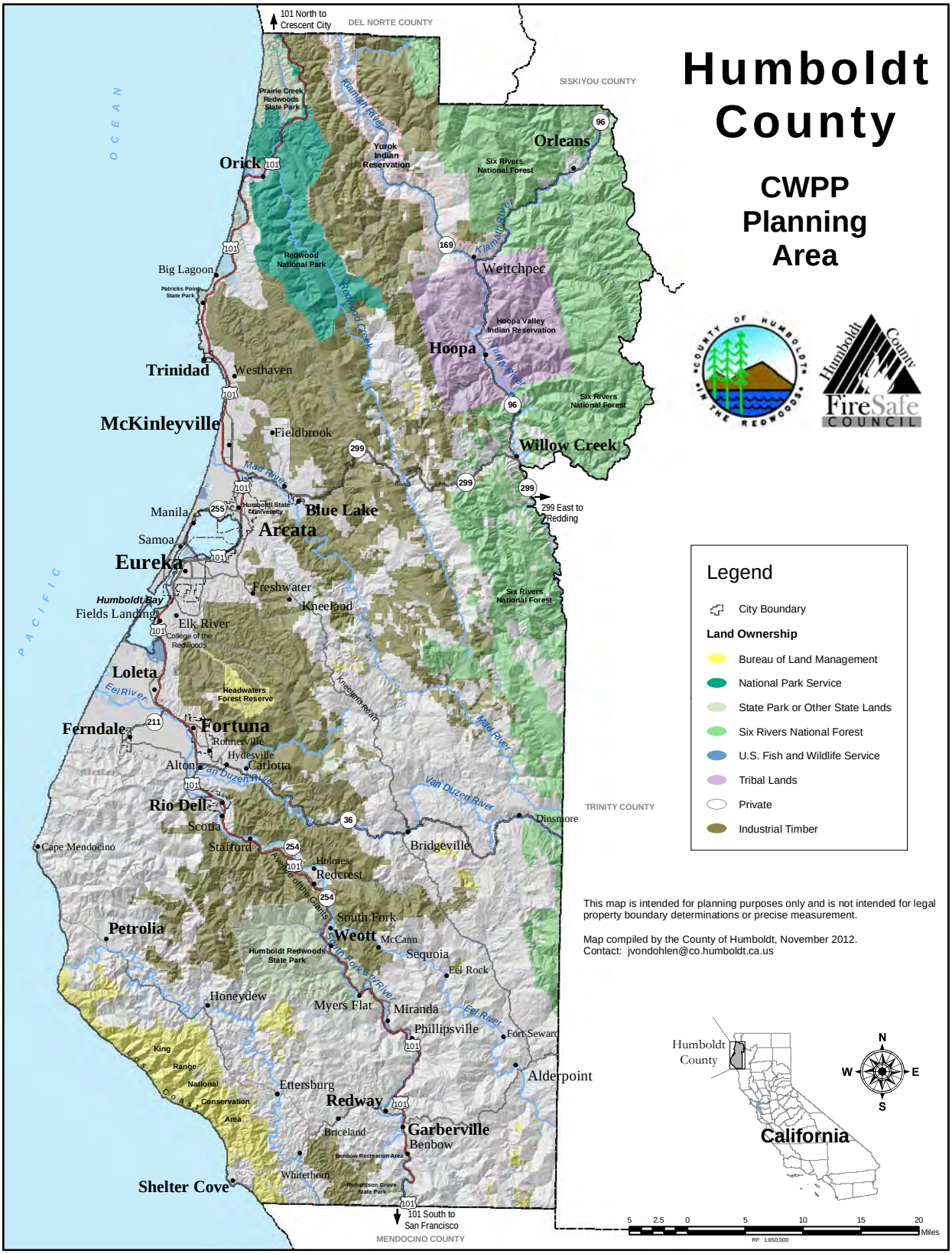
Moving inland, the Coast Range mountains rise quickly and dominate most of the county's interior and include the Eel, Van Duzen, Mattole, and Mad River *drainages* in the central and southern areas, and the Redwood Creek drainage in the northwest. In the furthest northeastern reaches of the county, the Klamath Mountains represent some of the higher elevations, with steep *slopes* that feed the Klamath and Trinity rivers. Eighty percent of the county's 2.3 million acres are forested. Fifty percent of this acreage is private commercial timberland (the county typically

has led the state in timber production), and 35 percent is state or federal public land, including Redwood National and State Park, Six Rivers National Forest, the King Range National Conservation Area, and Humboldt Redwoods State Park. While Douglas-fir represents the most predominant forest type, the more emblematic tree is that of the Coast Redwood, of which towering groves thrive in the county's moist temperate climate. Though forests are a defining feature, agriculture is a key part of the *landscape* and remains an important base industry. Approximately one-quarter of Humboldt County (634,000 acres) remains agricultural.

Vistas of Humboldt County



Figure I.1-1. CWPP Planning Area Map



I.2. Plan Context

Healthy Forest Restoration Act Criteria for Certification as a Community Wildfire Protection Plan

The National Fire Plan[1] 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."[2] 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,[3] encourages the development of CWPPs, as defined by the Healthy Forests Restoration Act (HFRA). A CWPP, as defined by the HFRA, is a plan for a community at risk 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 CWPP was collaboratively developed. Significant efforts were made throughout the planning process to collaborate with local, state, and federal land and fire management agencies. The Humboldt County Fire Safe Council (HCFSC) was formed to collaboratively guide the planning process; it is made up of members and advisors from local FSCs, the Humboldt County Fire Chiefs Association (Fire Chiefs), individual local fire departments and companies, the Humboldt County Office of Emergency Services, the Hoopa Valley Tribe, California Department of Forestry and Fire Protection (CAL FIRE), Six Rives National Forest, the BLM, and the insurance industry. In addition, community workshops and outreach efforts were designed and conducted to maximize community input into the process. *For more information on the planning process, see Chapter I.3. Planning Process below.*

Prioritized Fuel Reduction

> *B) The plan identifies and prioritizes areas for hazardous fuel-reduction treatments and recommends the types and methods of treatment on Federal and non-Federal land that will protect one or more at-risk communities and essential infrastructure.*

This CWPP identifies priority areas for hazardous fuel-reduction treatments and recommends types and methods of *treatment* to reduce the risk of wildfire to communities and resources within the planning area. Prioritized treatments can be found in Part III. Countywide Action Plan and Part IV. Planning Unit Action Plans. Detailed community-identified fuel reduction project data is stored and maintained through the use of a web-based Geographic Information System (GIS)

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[1] An informative summary of the National Fire Plan can be found at:

Forests and Rangelands. (2012 November 20). *Resources: Previous Wildland Fire Management Initiatives.* Retrieved from http://www.forestsandrangelands.gov/resources/overview/index.shtml

[2] California Fire Alliance. (2012). *Organization and History.* Retrieved from http://www.cafirealliance.org/organization_history/.

[3] California Fire Alliance. (2012). *Community Wildfire Protection Plan Guidance.* Retrieved from http://www.cafirealliance.org/cwpp/

mapping tool known as the Humboldt GIS Portal. The Portal can be accessed by going to: http://gis.co.humboldt.ca.us/ then choosing "Fire Planning" from the list of mapping applications.

Treatment of Structural Ignitability

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

This CWPP recommends measures to reduce the *ignitability* of structures throughout the planning area. These recommendations can be found in Part V. Fire-Safe Communities, Part III. Countywide Action Plan, and Part IV. Planning Unit Action Plans. In addition, the community workshops conducted during the development of the Plan served as an important venue to educate the public regarding reducing fire risks to structures, both through presentations by CAL FIRE and the local fire service, and through the distribution of educational materials.

Current National and State Fire-Planning Context

Although this Community Wildfire Protection Plan process originated with the directives of the 2001 National Fire Plan, new guidance has since been developed, policy titles have changed, and new priorities have been identified—all of which have also been incorporated in this CWPP.

In 2009, the President signed into law a bill which contained the Federal Land Assistance, Management and Enhancement (FLAME) Act, which was produced in response to several years of mounting, catastrophic wildfire events that occurred across the country. The FLAME Act established the Wildland Suppression Reserve Fund—a separate account for addressing the impacts of ongoing and increasing problems with wildfire *suppression* emergency costs. In addition to the funding language, the Act also directed the United States Forest Service and the Department of the Interior to submit a report containing a cohesive strategy for addressing *wildland fire* problems and determining how best to allocate fire budgets at the federal level. The FLAME Act has served as a catalyst for bringing fire leadership at all levels together and prompting a new approach to how wildland fire is managed.

In response to the budget allocation requirements of the FLAME Act, the Fire Program Analysis (FPA) System was developed. The FPA provides public-land managers with a common interagency process for fire management planning and budgeting to evaluate the effectiveness of alternative fire-management strategies through time, to meet land-management goals and objectives; it is updated and re-evaluated each year.[4] In order to devise methods of addressing wildland fire problems, the Wildland Fire Leadership Council (WLFC)— an intergovernmental committee of federal, state, tribal, county, and municipal government officials, which provides strategic oversight to ensure policy coordination, accountability, and effective implementation of Federal Wildland Fire Management Policy—directed the development of the National Cohesive Wildland Fire Management Strategy (Cohesive Strategy). The Cohesive Strategy is a collaborative process involving all levels of government, as well as non-governmental organizations and the public in pursuit of "all-lands" solutions to wildfire management issues. It is intended and envisioned "to safely and effectively extinguish fire, when needed; use fire where allowable; manage our natural resources; and as a Nation, live with wildland fire."[5] From that vision, three primary goals emerged:

- Restoring and Maintaining *Fire-Resilient* Landscapes,
- Creating *Fire-Adapted* Communities, and

4 Fire Program Analysis System. (n.d.). *Overview.* Retrieved November 16, 2012, from www.fpa.nifc.gov/

5 Forest and Rangelands. (2012 November 20). *National Cohesive Wildland Fire Management Strategy.* Retrieved November 16, 2012, from www.forestsandrangelands.gov/strategy/documents/reports/1_CohesiveStrategy03172011.pdf

- Improving Response to Wildfires.

This CWPP shares the Cohesive Strategy's goals and aims to promote the implementation of policies and actions to further these same ends. The Wildfire Environment chapter in Part II: Risk Assessment examines the factors that make landscapes more resilient or vulnerable to catastrophic wildfire events and acknowledges the crucial role that fire history plays in shaping healthy landscapes. Part V: Fire-Safe Communities emphasizes the importance of local residents doing their part to prepare and plan for emergencies and helping build communities that are adapted to the wildfire environments within which they are located; thus avoiding wildfire damages. The Countywide Action Plan in Part III addresses the importance of lending administrative and community support to fire-protection entities and identifies "Enhancing Fire Protection: Helping Firefighters Protect the Community" as the top priority for action in Humboldt County. Furthermore, the synergistic approach of the Cohesive Strategy coincides with the *collaborative* processes adopted within this CWPP; its development has been widely inclusive and recommendations for moving forward with its implementation advocate for the active involvement of all stakeholders and levels of government.

This County CWPP also aligns itself with the goals of the California State Fire Plan. Adopted in March 2010, the California State Fire Plan was a cooperative effort between State Board of Forestry and Fire Protection and CAL FIRE, and is designed to act as a road map for reducing the risk of wildfire in California. The Plan is built upon seven goals and their associated objectives; each goal is meant to build upon the previous one. "Collectively, these goals and objectives provide a framework to address the protection of lives, property and natural resources from wildland fire and improve environmental resilience to wildland fire."[6] The goals of this County CWPP are consistent with those of the state; they provide an excellent summation of the overarching aspirations and wider purpose of community wildfire protection planning.

[6] California Department of Forestry and Fire Protection (CAL FIRE). (2012). *2010 Strategic Fire Plan for California.* Retrieved from http://osfm.fire.ca.gov/fireplan/fireplanning.php

I.3. Planning Process

The planning process to update the 2006 MFPP was guided by the HCFSC with support from County staff and consultant services provided by ForEverGreen Forestry.[7]

I.3.1. Humboldt County Fire Safe Council's Role

The update of this Plan has been the primary 2011-2012 focus of the HCFSC. One of the first steps in the process was to evaluate the fire *planning compartments* used in the MFPP. These compartments were smaller units of analysis that allowed those areas to be studied in greater depth. The HCFSC decided to call these units of analysis "Fire Planning Units" (Planning Unit), which is a more commonly used term. It was also decided to change the boundaries of these Units to facilitate improved CWPP implementation.

A committee of the HCFSC was tasked with modifying Planning Units. The committee began with the original boundaries, which had previously been based on *watershed* planning boundaries modified slightly to consider the jurisdictional areas of fire districts. The major shift in approach that resulted in the most significant change to the boundaries was the decision to consider the areas served by local FSCs. The idea was to not break up FSC areas into different Planning Units, and to use them where they existed as the basis for the Unit boundary. This would make it easer to incorporate local CWPP planning areas into the County plan where local FSCs had developed or were in the process of developing them. The end result of the above process was an increase from eleven Planning Compartments to thirteen Planning Units.

The Southern Humboldt, Mad-Van Duzen, Willow Creek, Lower Mattole, and Orleans/Somes Bar local CWPP planning areas were used as the basis for the Planning Units in those areas. In some cases, alterations were made to accommodate overriding considerations in the County CWPP. For example, the Orleans/Somes Bar, Southern Humboldt, and Willow Creek CWPP planning areas extended into neighboring counties, but the Humboldt County Planning Units are cut off at the Humboldt County line. However, in the Community Preparedness chapter (II.4) of Part II. Risk Assessment, a map illustrates where these local FSC planning areas spill over into Del Norte, Siskiyou, Trinity, and Mendocino counties. In addition, changes to the Willow Creek CWPP planning-area boundary resulted in removing the Titlow Hill area and including it in the Redwood Creek Planning Unit which made more sense geographically and demographically. Lastly, the Lower Mattole CWPP planning area follows the Mattole Watershed boundary while the Mattole-Lost Coast Planning Unit extends a bit further on the north side and ends just north of Cape Mendocino.

A Planning Unit Action Plan (PUAP) was written for each Planning Unit and can be found in Part IV of this CWPP. The PUAPs include a summary of the action items from existing local CWPPs and hence can be used by the associated local FSC to help guide their actions. For the Planning Units without a local CWPP, the PUAP can be used to guide their action and potentially guide the process of developing a local CWPP or Firewise action plan. Each PUAP can be used as a resource when applying for project implementation grant funds. The PUAPs are designed to be stand-alone documents and can be pulled out of the larger document and used at the local level.

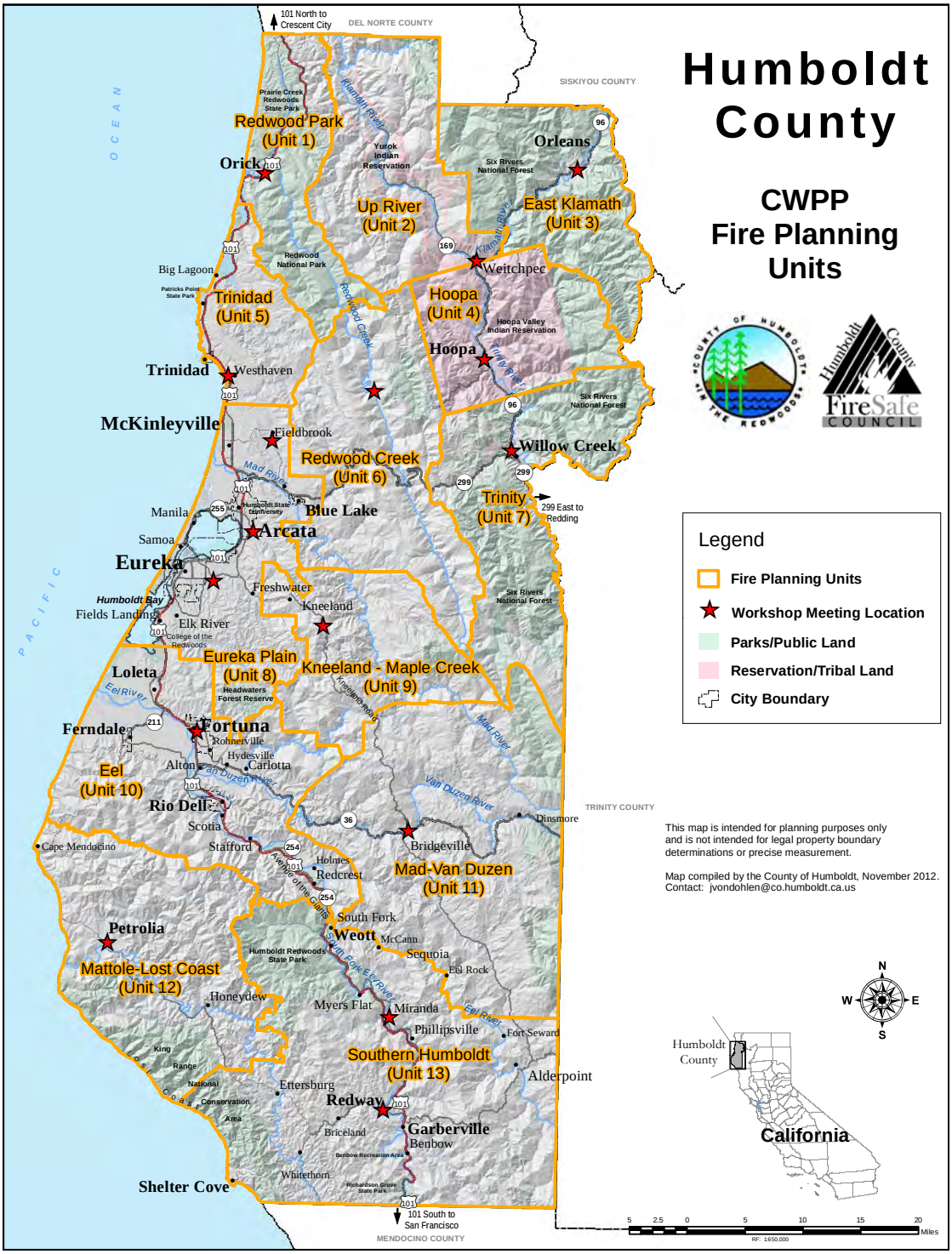
Following is the list of Planning Units by number. These are also illustrated on the map in Figure I.3-1 below.

1. Redwood Park
2. Up River
8. Eureka Plain
9. Kneeland-Maple Creek

[7] ForEverGreen Forestry. (n.d.). Retrieved November 16, 2012, from www.forevergreenforestry.com

3. East Klamath
4. Hoopa
5. Trinidad
6. Redwood Creek
7. Trinity
10. Eel
11. Mad-Van Duzen
12. Mattole-Lost Coast
13. Southern Humboldt

Figure I.3-1. CWPP Fire-Planning Units Map



Community Workshops

To meet CWPP requirements for public participation and collaboration, a series of Community CWPP workshops was organized and carried out. Sixteen workshops were held throughout Humboldt County between March and June of 2012. At least one workshop was held in each of the 13 CWPP Planning Units shown above in Figure I.3-1.CWPP Fire-Planning Units Map. Workshop locations are indicated with a red star on the map. A list of these workshops follows:

- Sunday, March 18th, **Mad Van Duzen Planning Unit** (Unit 11), *Bridgeville Community Center*
- Tuesday March 20th, **Southern Humboldt Planning Unit** (Unit 13), *South Fork High School Cafeteria*
- Friday, March 23rd, **East Klamath Planning Unit** (Unit 3), *Orleans Panamnik Building*
- Sunday, March 25th, **Mattole-Lost Coast Planning Unit** (Unit 12), *Mattole Valley Community Center*
- Thursday March 29th, **Southern Humboldt Planning Unit** (Unit 13), *Healy Senior Center*
- Saturday, May 12th, **Redwood Creek Planning Unit** (Unit 6), *Green Point Elementary School*
- Monday, May 14th, **Eureka Plain Planning Unit** (Unit 8), *Bayside Grange*
- Thursday, May 24th, **Trinity Planning Unit** (Unit 7), *Trinity Valley Elementary School*
- Monday, June 4th, **Kneeland-Maple Creek Planning Unit** (Unit 9), *Kneeland Elementary School*
- Thursday, June 14th, **Trinidad Planning Unit** (Unit 5), *Westhaven Fire Hall*
- Monday, June 18th, **Hoopa Planning Unit** (Unit 4), *Hoopa Valley Tribal Council Chambers*
- Wednesday, June 20th, **Up River Planning Unit** (Unit 2), *Weitchpec Tribal Office*
- Thursday, June 21st, **Eureka Plain Planning Unit** (Unit 8), *Fieldbrook Elementary School*
- Monday, June 25th, **Eureka Plain Planning Unit** (Unit 8), *Redwood Acres Fair Grounds*
- Tuesday, June 26th. **Redwood Park Planning Unit** (Unit 1), *Orick Community Hall*
- Thursday, June 28th, **Eel Planning Unit** (Unit 10), *Fortuna Fire Hall*

Workshop Design and Production

The HCFSC, County staff, planning consultant, and members of the Fire Chiefs worked together on the design and production of the workshops. Community members were encouraged to get involved and participate in the workshop provided for their Planning Unit area. All community members were encouraged to attend, especially residents living in forested areas and along narrow roads where there is only one way-in and one-way out access.

The focus of the workshops and one of the main objectives of the CWPP process was to engage in meaningful discussions at the community level in order to determine priorities and strategies to address the threat of wildfire to local communities. At each workshop local residents worked with firefighters and agency partners to identify projects to help prepare their homes, neighborhoods, and communities for wildfire. Local fire experts also shared information regarding how to prepare a property for fire and what to do before, during, and after a wildfire.

The overall purpose and desired outcomes of these workshops were as follows:

Purpose

- Educate residents regarding fire safety, protection, the Home Ignition Zone, and CWPPs.
- Seek information and participation from residents to effectively update and implement the CWPP.

Desired Outcomes

- Basic understanding of fire safety and the home ignition zone, to allow residents to implement these on their property and throughout their community.
- Broad-based participation in local FSCs and CWPP development and implementation.
- Opportunity to provide direct input into priorities for community fire safety.
- Identify local concerns and priorities on maps and prioritize projects to inspire future action and increase competitive advantage for funding.
- An understanding of the advantages of *Community Emergency Response Teams* (CERTs) and information about how to initiate one locally.

Much was learned from the community workshop series. Community members benefited from their participation and local fire-service representatives had an opportunity to communicate what they need most from their public in order to provide the best possible service. Members of the public were given the opportunity to gain a better understanding of the complex nature of the fire-protection services provided by local fire departments, CAL FIRE and, in some cases, the United States Forest Service (USFS). Valuable information was also gathered regarding what community members, including local fire-service representatives, believe are important *values and assets at risk* to wildfire, wildfire hazards and risk, fire-protection resources, and potential wildfire mitigation projects. This was done using a group mapping exercise that involved community members marking the locations of these items/areas on a large, print-out map of their Planning Unit area *(see Appendix D: Mapping Exercise Instructions).*

Public Outreach

Many strategies were used to get the word out to communities about the CWPP workshops. The process was kicked off with a press release that was written in collaboration with the planning consultant, County staff, the HCFSC, CAL FIRE, Fire Chiefs, and the Six Rivers National Forest. The press release was picked up and published by several local newspapers and was used as the basis for follow-up public service announcements (PSAs) and press releases. Local radio stations used the information provided to announce the workshops to their listening audiences. County staff also participated in radio interviews on KMUD and KHSU to promote the workshop series.

Multiple email listserves were used to get the word out. Emails were drafted and distributed to the membership of the Humboldt County Fire Chiefs Association, the Southern Humboldt Fire Chiefs Association, individual contact lists of FSC members and fire chiefs, and people who had previously expressed interest in following the activities of the HCFSC. Recipients of these emails were asked to forward them to friends and neighbors who they thought would be interested in the workshops. Workshop posters were created and posted in high-traffic locations within communities and emailed out to potentially interested community members. The HCFSC on-line homepage was used to post news releases, PSAs, workshop posters and agendas, and general announcements about upcoming workshops.

Local FSCs and fire departments were key partners in spreading the word in their respective communities about the workshop series. In some cases, where these contacts were not as strong, and/or where there was a concentrated population, a mailing was sent out to residents announcing

the workshop and providing information about fire planning. There was not sufficient funding available to do this widely but the practice was used on a few occasions.

Figure I.3-2. Sample Community Workshop Poster



I.3.2. CWPP Review

Several opportunities were provided for public participation and review of the CWPP.

Administrative Review and the Community Review Committee

Based on all of the information collected during the process described above, an Administrative Draft of the CWPP was produced in September 2012. A special HCFSC meeting was held on September 6, 2012 to review the draft plan and kick-off the Internal Review period. The CWPP Administrative Draft was posted on the HCFSC website and HCFSC members, as well as people who had volunteered for, or were selected to be on a Community Review Committee (CRC), were asked to provide feedback. The CRC was informally created by community members indicating their desire to participate on CWPP workshop sign-in sheets. Additional members were invited to the CRC based on their particular experience or knowledge. The hope is that this experience will garner ownership and inspire members of the CRC to get involved in plan implementation.

The results of this Internal Review were incorporated into the public review draft of the CWPP.

Public Review Draft

A public review version of this CWPP was released on November 30, 2012. The availability of the plan for public review was announced via newspaper articles, radio announcements, emails, and web-postings. The public was given approximately six weeks to review the CWPP and submit their comments for inclusion in the final version. After February 15, 2013, at the end of the Public Review period, all public feedback was considered and, as appropriate, incorporated into the final draft.

Final Review and Approval

The final draft CWPP was reviewed by the HCFSC at their April 15, 2013 meeting. The members of the HCFSC unanimously approved the plan to be forwarded to the Fire Chiefs, CAL FIRE, and Board of Supervisors for review and approval. All necessary signatures were secured and the CWPP was finalized in June of 2013. [This is a planned future action that will be included in the final draft if all approvals are granted].

I.4. 2006 Plan Implementation Progress Review

In 2006, the Humboldt County BOS approved and certified the MFPP as a CWPP. The MFPP was developed for use as a framework for fire coordination, prevention, and protection throughout the county. The MFPP also made significant findings and recommendations relating to fire-protection capability, fire-safe education, fire hazard and *risk assessment,* fire-risk reduction and management, community preparedness and response, and fiscal issues relating to fire protection. The following pages contain activity summaries for progress made on the implementation of priority recommendations from the 2006 plan:

- Fuel Modification/Biomass Utilization
- Develop a Reliable Revenue Source for Fire Protection
- Level of Service Standard
- Improve Emergency Dispatch
- MFPP Policy Recommendation Integration into the GPU
- Firewise Recognition Program
- Community Wildfire Protection Plan Program

I.4.1. Fuel Modification/Biomass Utilization

Excerpts from the 2006 Master Fire Protection Plan that support this work:

FSC Goal: Encourage countywide efforts to reduce or modify *fuel loads* for community protection and fire prevention.

Recommendations:

- Emphasize increased countywide coordination of fuel modification projects by all involved agencies and organizations.
- Develop a biomass-utilization program to develop commercially viable markets for fuel-reduction project wood byproducts and residue such as *slash,* small diameter logs, foliage, wood chips, etc.

Progress

Humboldt County Hazardous Fuels Reduction Plan Update

A $24,000 California Fire Safe Council State Clearinghouse grant was awarded to the HFSC by the US Forest Service to update the *hazardous fuels reduction* plan portion of the 2006 Humboldt County MFPP. The results of the update process are cataloged and displayed in the 2009-2010 Humboldt County Hazardous Fuels Reduction Plan Update which can be viewed on the County website at: www.co.humboldt.ca.us/natural-resources/fire_safe_council/.

Detailed maps and associated community-identified fuel reduction project data have continually been updated and managed through the Humboldt GIS Portal. The Portal can be accessed by going to: http://gis.co.humboldt.ca.us/, then choosing “Fire Planning” from the list of mapping applications. The fuels reduction project data described in the CWPP and displayed in the GIS Portal were generated through the evaluation of projects identified in the 2006 MFPP, the 2009-10 Humboldt County Hazardous Fuels Reduction Plan Update, gathered at subsequent community-based meetings including the 2012 CWPP Update community workshops mentioned above in *I.3.2 “Community Workshops”,* and subsequently reviewed and refined by local FSC representatives, Humboldt County staff, and fire-agency personnel.

Northwest California Regional Fire Safe Council Conference

The grant also funded the 2009 "Northwest California Regional Fire Safe Council Conference." Participation in planning the conference came from a diverse group representing Humboldt County, Orleans/Somes Bar, and Van Duzen Watershed FSCs, the Humboldt County Planning Division, University of California Cooperative Extension, Humboldt State University, the Mattole Restoration Council, the Fruitland Ridge and Miranda fire departments, Six River National Forest, CAL FIRE, the US Fish and Wildlife Service, and the Trinity County Resource Conservation District. Presentations and panelists were secured from most of the above organizations and agencies as well as the North Coast Unified Air Quality Management District, the Center for Forestry at the University of California Berkeley, Jeff Bryant Forestry, the Del Norte FSC, the Trinity County FSC, the FSC of Siskiyou County, the Mt. Shasta Area FSC, and Redwood National Park.

The two-day conference was held on December 10 and 11, 2009 at the Fortuna Fire Department Hall. Representatives from countywide FSCs were present from Humboldt, Siskiyou, Del Norte, and Trinity Counties. The smaller FSCs of the Lower Mattole, Southern Humboldt, Van Duzen Watershed, Orleans/Somes Bar, Willow Creek, and Mt. Shasta areas were also represented. Presentations were provided on several topics, including woody biomass utilization from both the landowner's and researcher's perspectives, and fuel treatments with particular attention to what's next for areas that have already received treatment, and the impediments to the use of prescribed fire. Information was provided on building materials and design for home survival in wildfire-prone areas, *Best Management Practices* in regards to natural resources and environmental compliance, and a variety of cost-share programs designed to support wildfire mitigation and forest health projects. All of the PowerPoints for these presentations can be found on the Humboldt County FSC website at: www.co.humboldt.ca.us/natural-resources/fire_safe_council/.

FLASH Program

A $300,000 California Fire Safe Council State Clearinghouse grant program funded by the USFS was successfully completed. These federal dollars were matched by over $33,000 dollars of local in-kind and cash support. The program was named Fire-adapted Landscapes and Safe Homes (*FLASH*) and provided incentives to property owners to mitigate wildfire hazards through vegetation management. This was done by awarding a rebate for the creation of *defensible space* around homes and strategic *fuelbreaks* along escape routes and high-risk areas.

During the grant period, hazardous vegetation on slightly over 311 acres of land was treated to reduce the wildfire risk for homesteads and *access routes*. A total of 114 landowners completed work on their properties through this program. Eight local field technicians were trained and gained experience in assessing wildfire hazards, making fuel reduction treatment recommendations, and conducting inspections to ensure fuel-reduction work was correctly completed. These technicians conducted 267 site visits, over 114 of which included a *home risk assessment*.[8] Many individuals received a portion of their income through this program including County staff, local target area program administration and field staff, fuel hazard reduction crews, as well as property owners who did the work themselves and were reimbursed through the program.

In 2012, additional funds to support the continuation of the FLASH program were awarded through the California Fire Safe Council State Clearinghouse in the amount of $195,000. These federal dollars were matched by over $195,000 dollars of local in-kind and cash support. The program covers approximately 50% of the cost of the work with a rebate and the property

[8] *See Appendix E: Home Risk Assessment*.

owner's payment or labor for the balance is counted as match. The goal of this program is to treat approximately 200 acres of hazardous vegetation by mid 2013.

This has been a very successful program and the HCFSC is grateful to have the opportunity to continue working in the target areas with additional support from the USFS. Target areas include the areas served by 1) the Orleans Somes Bar FSC, 2) the Willow Creek FSC, 3) the Van Duzen Watershed FSC, 4) the Lower Mattole FSC and the Mattole Restoration Council, and 5) and the Southern Humboldt FSC. Within the five target areas, there are now thriving community outreach programs educating property owners about how they can reduce their vulnerability to wildfire losses. Information for this program was also incorporated into multiple CWPP workshops and Firewise events. For more information on this program visit: www.co.humboldt.ca.us/natural-resources/fire_safe_council/fsc_flash.aspx

Fuel-Reduction Projects

CAL FIRE staff, in conjunction with Humboldt County staff and local FSCs, were able to implement several key fuel-reduction projects. These projects had been identified collaboratively through the Humboldt County and Humboldt Del Norte Unit CWPPs. They included the construction of *shaded fuelbreaks* to enhance and protect the public and emergency services personnel for purposes of *ingress and egress*. These projects also acted as demonstration projects in highly visible areas, allowing the public to interact with both CAL FIRE and local grassroots organizations, including local FSCs. Funds for these projects were awarded through a statewide hazardous fuels treatment grant.

The interactions that are fostered and supported through these types of fuel reduction projects are many. The countywide fuel reduction and fire-safe planning strategy supported these projects. Humboldt County's CWPP has been and remains a very important conduit allowing quick, flexible, and responsive implementation of fuel-reduction project work.

Biomass

Pertinent articles related to *biomass utilization* opportunities are continuously shared both with the Humboldt County FSC members and with the Humboldt Biomass listserve.

Interaction continues with the University of California Cooperative Extension, Humboldt State University Schatz Energy Center and the Redwood Coast Energy Authority (RCEA) to stay abreast of technology developments and opportunities and pass those on to the County and local FSC members.

Finally, communication continues with the three existing biomass facilities in the County: DG Fairhaven, Scotia, and Blue Lake Power (formerly Ultra Power).

I.4.2. Develop a Reliable Revenue Source for Fire Protection

Excerpts from the 2006 Master Fire Protection Plan that support this work:

FSC Goal: Support fire prevention and resource protection efforts of local communities, local FSCs, special districts with fire-safety responsibilities, fire organizations, and JPA cooperative services (dispatching, hazmat, training and other cooperative opportunities).

Recommendations:

- Develop reliable sources of ongoing funding for *fire protection districts* and departments, such as revenue exchange agreements, *benefit assessments*, mitigation *fees*, and user fees.
- Provide technical support to local organizations that seek to establish (tax) benefit assessment areas as well as alternative funding mechanisms. Coordinate with state/federal government funding programs (e.g., Amador) as sources of funding for community fire protection.

- Encourage the provision of fire-protection services through a district or local agency that provides a stable source of revenue from property tax, assessments, fees, or other sources

Progress

Revenue Source for Fire Protection Committee

A committee of the HCFSC has been involved in exploring opportunities for generating sustainable revenue to support fire protection through fire district reorganization and formation. This committee has developed a reference guide for the various funding mechanisms available to local government fire protection entities. The guide is intended to provide initial descriptions, process explanations, government-code citations, practical tips and other information related to funding mechanisms and their implementation. The guide addresses benefit assessments, special taxes, and Mello Roos funding. Information is also included on formation, expansion, or *annexation* of fire districts. It is an informational guide for districts or potential districts, designed to give them an idea of the different types of funding measures available to districts and the requirements of each of the different types of measures. A compact disc (CD) containing the guide and additional resources can be obtained from the HCFSC. The guide will be updated as new information is available. District or potential district representatives are also encouraged to contact local fire officials who are able to supply information and resources related to funding mechanisms.

LAFCO

County staff and committee members have been helping *fire companies* and fire-protection districts navigate complex local agency formation and expansion, and local election processes. They have attended Fire Chiefs and Local Agency Formation Commission (*LAFCO*) meetings as well as community meetings to discuss various options and report progress. They have assisted with paperwork and document preparation as well as the interpretation of relevant state laws. These efforts are being coordinated with LAFCO Staff. County staff is currently working closely with several fire departments on a variety of initiatives.

Fire Protection District Formation

Four fire companies recently navigated a very complicated fire-district formation process in an attempt to create an official jurisdictional area and financial support through a special tax. The last step in the process was an election. The formation of the new fire-protection districts was contingent upon the approval of the special tax by two-thirds of the votes cast by voters on the measure within the proposed district boundaries. Briceland and Bridgeville fire companies received the required number of votes in support of the measure. Fruitland Ridge and Palo Verde fire companies did not receive the votes needed to become a new district supported by a special tax. Fruitland Ridge lost the election by only a few votes; the future of that fire company is now in jeopardy. The future of the Palo Verde fire company is also uncertain as leadership changes hands and the scope of services that they are able to provide is evaluated.

Fire Protection District Boundary Expansion

Ten existing fire protection districts are contemplating the possibility of expanding their boundaries to more accurately reflect where services are regularly provided. If they choose to move forward, these districts will need to work closely with LAFCO to complete a district annexation process. The majority of these districts are currently in the process of working with the County on negotiating potential tax sharing agreements that would support the provision of services beyond their current *jurisdictional area*. They may need to also explore other revenue-generating strategies such as special taxes or benefit assessments. These districts are:

- Garberville Fire Protection District
- Redway Fire Protection District
- Telegraph Ridge Fire Protection District
- Whitethorn Fire Protection District
- Rio Dell Fire Protection District
- Fieldbrook Community Services District
- Ferndale Fire Protection District
- Petrolia Fire Protection District
- Blue Lake Fire Protection District
- Kneeland Fire Protection District

Other

In 2010, the Aircraft Rescue Fire Fighting (ARFF) grant was awarded by Homeland Security allowing firefighters protecting County airports to be formally trained for the first time in County history.

I.4.3. Level of Service Standard

Excerpts from the 2006 Master Fire Protection Plan that support this work:

FSC Goal: Promote local fire-safe planning, fire-safe standards, fire-education programs addressing fire risk in rural areas, and measures that local communities can implement to be fire safe.

Recommendations:

- Develop *level-of-service standards* for the provision of all fire protection services (fire, EMS, HazMat, rescue) in the County, and make such standards public so that landowners and residents understand what is and is not available to them.
- Establish minimum levels of fire protection service for Humboldt County communities.

Progress

Fire-Planning Mapping Application

The fire-planning mapping application in the Humboldt GIS Portal continues to be maintained as a tool to view elements of fire protection service. As new information is provided by fire departments it is uploaded to the application at this site: http://gis.co.humboldt.ca.us/. Choose 'Fire Planning' from the list of mapping applications and the program will load a map showing fire department response areas and display data regarding level of service. This information is for general reference only. For detailed planning purposes, users must contact the local fire department and/or a County GIS specialist. This is a disclosure tool that helps show the baseline of current level of service.

Fire Chiefs Association's Fire Services Annual Report

Beginning in 2008, the Fire Chiefs began producing a Fire Services Annual Report, to be presented to the BOS and posted on the HCFSC webpage.[9] This report, which contains information on all the fire departments in the county, can be used as a directory. Each fire department is represented by its own page, which includes a brief description of the department and its capabilities, as well as its contact information, the fire chief's name, and a summary of the year's number of incident responses, volunteer hours, and personnel. The report also includes a letter from the President of the Fire Chiefs summarizing the year's activities, challenges, and accomplishments. Over the past few years, producing the Annual Report has become a coordinated effort between the Fire Chiefs, CAL FIRE, and the HCFSC. These three groups

[9] Annual Reports are posted on the HCFSC Home Page at www.co.humboldt.ca.us/natural-resources/fire_safe_council/ and can be found under "Quick Links."

recognize the value of this report as a tool for increasing awareness among elected officials and the public about who provides local community fire protection, what services they provide, and the level of volunteer effort needed to sustain the service. The Report is also used to update the level of service information provided in the Humboldt GIS Portal mentioned above.

Level of Service Standards Committee

An HCFSC committee continues to work closely with the Fire Chiefs to identify and agree on a minimum Level of Service standard. The standard will need to be tiered, acknowledging that there are different expectations and capacities in rural, suburban, and urban environments. It has been determined that training-level standards are the most critical focus area for this topic. The Fire Chiefs liaison to the FSC will continue to identify areas of needed collaboration.

I.4.4. Improve Emergency Dispatch Services

Excerpts from the 2006 Master Fire Protection Plan that support this work:

FSC Goal: Assure adequate fire protection for people, property, and communities.

Recommendations:

- Improve communication and coordination between local fire departments, state agencies, federal agencies, and other allied agencies during fires and other emergencies.
- Support communication and collaboration between fire and public safety agencies while maintaining the integrity of their distinct public service roles.

Progress

Improve Emergency Dispatch Services Committee

A committee of the HCFSC has focused its efforts on monitoring and contributing to activities countywide that are related to improving emergency services communications. Although not directly associated with the HCFSC, significant funding has been awarded to the local fire service that will help achieve the goal of improving *emergency dispatch services*. A $775,000 federal grant has been approved that will help the fire service go from one of the oldest communication systems in the state, to one of the most state-of-the-art systems.

Humboldt Operational Area Communications Committee

The County continues to build a relationship with other agencies in the area and is talking to other places that have similar issues. The County has formed the Humboldt Operational Area Communications Committee (HOACC) composed of representatives of area local, state, and federal agencies and other area organizations operating radio communications systems in the County. Areas of known need are being addressed through partnering actions and continued expenditures (using both grant funding and local appropriations). HOACC partners are sharing information on their radio communications infrastructure, looking for common pathways of immediate development and cost savings, and paying particular attention to future system coordination and compatibility issues.

Dispatch

Community input provided through CWPP outreach indicates that there are still problems with how fire departments are being dispatched and confusion about how road names and home addresses are organized in some areas. Despite these problems the dispatch system run out of the CAL FIRE Command Center in Fortuna is very effective given the scale of the service area and the number of different service providers. Nonetheless, it has been identified that coordination between CAL FIRE, Sheriff, local fire departments, County Public Works, and County Planning

could address some of the dispatch, addressing, and road name issues. It has also been recognized that it is a priority to educate the public regarding how to properly use 9-1-1, including how to effectively communicate the location of an incident to dispatchers. These continuing challenges are addressed in the Countywide Action Plan, in Part III of this CWPP.

Improve Communication and Coordination

Local Fire agencies and organizations in Humboldt County have made significant strides in the last several years to meet the demand for their services. Through the development of a countywide *mutual-aid agreement* and a standardized *apparatus* numbering system, the deployment of resources to emergency incidents is much more organized and efficient. Mutual-aid agreements provide a more reliable and supported response to emergencies, especially when there aren't sufficient resources available within any given response area. The basic premise is that all participating fire-service providers agree to mutually supplement each other's response capabilities when needed. The standardized numbering system helps avoid the confusion of having fire engines and other firefighting apparatus with the same number all responding to an incident. The new system facilitates and simplifies the dispatch of resources as well as their operational control on scene.

Another recent development that is supporting improvements in communication and coordination is the formation of an Incident Support Team. The Fire Chiefs Association is still in the process of forming this group, which is intended to increase the standardization of how incidents are handled. A team composed of individuals from multiple agencies is being trained in various overhead positions. This team will be available to any fire service organization to call upon during a large emergency to assist with communication, coordination, and decision-making.

I.4.5. MFPP Policy Recommendation Integration into the GPU

Excerpts from the 2006 Master Fire Protection Plan that support this work:

FSC Goal: Assure adequate fire protection for people, property, and communities.

Recommendations:

- Update the Humboldt County General Plan to include policies and standards that encourage new development in areas with adequate fire protection.
- Consider the *wildland-urban interface* (WUI) in the planning process, and address future fire-safety needs and requirements associated with development in WUI areas.
- Require fire-risk disclosures for new development in high fire-risk areas. Impose conditions on new development in these areas to provide onsite fire protection and prevention measures (e.g., fuelbreaks, adequate water sources).

Progress

The HCFSC coordinated their efforts with County Planning staff to integrate recommendations from the 2006 County fire plan into applicable elements of the General Plan Update (GPU). FSC members received drafts of GPU elements and plan-review materials and provided input to Planning staff and the Planning Commission, and additional recommendations as necessary. The FSC provided review and feedback for the Community Infrastructure and Services Element and the Safety Element of the GPU. All FSC recommendations were approved by the Planning Commission and are being forwarded to the BOS. For more information on the GPU, visit: www.planupdate.org.

I.4.6. Fire Safe Education

Excerpts from the 2006 Master Fire Protection Plan that support this work:

FSC Goal: Promote local fire-safe planning, fire safe-standards, fire-education programs addressing fire risk and hazard in rural areas, and measures that local communities can implement to be fire safe.

Recommendations:

- Provide fire-safety education to residents, and the homebuilding, insurance, real estate, landscaping, and building supply industries.
- Provide education to residents connecting fire-safe forests, timber production, and ecological *restoration efforts*.
- Increase public awareness of fire as a tool for improving community fire safety, forest health, and ecological diversity through public education.

Progress

Firewise

The HCFSC and County staff have worked closely with local communities to get recognized as Firewise Communities/USA sites. Title III grants have been awarded by the County to local FSCs to conduct community risk assessments, write Firewise plans, and hold community Firewise days in coordination with local fire departments. The National Fire Protection Association's (NFPA) Firewise Communities program teaches people how to adapt to living with wildfire and encourages neighbors to work together and take action to prevent losses. The program provides many tools and resources to communities.

Thus far, the communities of Bridgeville, Honeydew, Upper Jacoby Creek, Orleans, Petrolia, and Willow Creek have achieved national Firewise recognition. Several more communities are interested in participating in the program and have taken steps to organize their residents. Firewise assessments and action plans serve as excellent tools for communities to collaboratively learn about and identify actions to address wildfire hazards in their community. Firewise also provides an opportunity for communities, not only to raise awareness about wildfire risks, but to showcase what they are already doing to mitigate those risks. Community Firewise events have been used to share the results of successful projects such as: a new or updated local fire plan, educational brochures or videos, or mechanical treatments and prescribed burns to manage *hazardous vegetation* and improve forest health.

Communities that have achieved Firewise status were also eligible for, and in some cases awarded Title III grant funds from the County to implement components of their action plan. So far Willow Creek and Bridgeville have used funding to support annual community Firewise events and to design *Blue Dot Programs* that help identify and/or develop water sources that are appropriate for fighting fires. The Bridgeville project also includes posting of address and road signs to improve the ability of firefighters to find residences in an emergency.

I.4.7. Fire Safe Planning and Hazard Identification

Excerpts from the 2006 Master Fire Protection Plan that support this work:

FSC Goal: Support efforts of local fire organizations and *FSCs* to maintain adequate staffing levels and to serve as public safety agents, and monitor these efforts.

Recommendation:

- Work with local FSCs, fire protection organizations, and other applicable entities to incorporate wildfire safety measures, fire hazard mitigations, accessible roads data,

emergency water supply locations, flammable vegetation clearance for defensible space techniques, and other fire safety techniques, into local community planning.

Progress

Local CWPP Updates

The countywide fuel reduction and fire-safe planning strategy is being supported through a coordinated update and refinement of Humboldt County's CWPP. As part of this project, the Humboldt County FSC and County staff have worked closely with the Willow Creek, Southern Humboldt, Van Duzen Watershed, Lower Mattole, and Orleans/Somes Bar FSCs to either update or complete their local CWPPs. These local CWPPs are being incorporated into and referenced in this countywide CWPP. Secure Rural Schools and Community Self-determination Act, Title III funding for this project is supporting County staff time associated with updating the County CWPP, assistance to local communities with developing and updating their local CWPPs, community outreach, and GIS database maintenances. Title III grants have also been awarded to the community groups involved in drafting and updating their local CWPPs. County staff is managing the distribution of these grant funds.

CWPP Community Workshops

County staff, with support from the Humboldt County FSC, completed 16 workshops throughout the County. These workshops were held in order to seek information and participation from residents, including local fire-service representatives, and to educate residents regarding fire safety, protection, the Home Ignition Zone, and the Humboldt County CWPP.[10] Large amounts of data were collected at these workshops on community-identified wildfire risks and hazards, assets and values at risk to wildfire, fire protection resources, and proposed wildfire mitigation projects. This information is being incorporated into the County GIS database and will be used to update the Fire Planning application of the Humboldt GIS Portal.

[10] *For more information see Section I.3. Planning Process above.*

Part II. Risk Assessment

Overview

This Risk Assessment is a summary of the factors that contribute to wildfire in Humboldt County, and a qualitative assessment of those factors. To assess fire risk in the county as systematically and comprehensively as possible, one must attempt to catalogue and analyze all the specific and unique aspects and features that combine and interact to make Humboldt County itself—Humboldt, and no other county like it. Useful comparisons and contrasts can be drawn with neighboring areas.

Chapter II.1. **Wildfire Environment** provides a broad introduction to wildfire in Humboldt County. This chapter describes aspects of fire behavior and discusses the environmental conditions within the county that influence that behavior, such as *topography* and weather patterns. There is also an examination of different *fuel compositions* and the types of wildfire they are liable to generate. This chapter provides an analysis of Humboldt County's fire history, including a discussion of the role fire has played in shaping the landscape and ecosystems here, probable *ignition sources*, as well as a discussion of the various fire management trends and regimes that have been implemented over the years and how they have impacted the natural environment. The contents of this chapter will lead to a greater understanding of fire, which can help residents learn how to better coexist with it.

Chapter II.2. **Values and Assets at Risk** outlines those things that are important to the quality of life in Humboldt County that can be threatened by wildfire. It lists the communities within Humboldt County that have been designated as at risk to wildfire and includes a description of some of the most valued resources within these communities, such as homes, schools, and medical facilities. This chapter describes the natural resources within the county that are of great value to residents (both human and non), and gives a general assessment of their vulnerability to wildfire.

Chapter II.3. **Wildfire Protection Capabilities** provides an overview of fire protection services in Humboldt County. This chapter describes the various fire-protection entities and jurisdictions that exist within the county as well as the types of services they provide to communities within their districts and response areas. It discusses factors impacting the efficient delivery of fire-protection services. Information in this chapter aims to educate residents about the firefighters and organizations devoted to protecting their lives and homes from fire and raise community awareness regarding how to support local firefighters in doing so.

Chapter II.4. **Community Preparedness** discusses community-based efforts to prepare Humboldt County residents for wildfire. The chapter lists the community groups within the county that have self-organized and taken steps to enhance fire safety in their communities. It also examines the efforts of local organizations to enhance wildfire awareness, and includes a variety of resources and programs available to communities seeking to take greater responsibility for protecting themselves against the risks of wildfire. This chapter directs residents to resources that can help prepare them in advance and prepare their communities for wildfire.

Finally, Chapter II.5. **Risk Assessment Summary** presents a summary analysis of each of the Risk Assessment chapters. The analysis is based on a qualitative scale from low to very high, with very high signifying the highest risk in most cases. These rankings informed the process of identifying priority actions on a countywide scale. This CWPP recommends undertaking an ongoing, detailed risks assessment at the local level to guide appropriate action for the level of wildfire risk faced by each community within Humboldt County.

Humboldt County Community Wildfire Protection Plan

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II.1. Wildfire Environment

II.1.1. Introduction: Defining the Wildfire Problem

According to the California Forestland Stewardship Program:

> "Fire is an integral part of most California landscapes. Many of our native plants, including trees, are adapted to burn periodically; they need fire to be healthy, reproduce, and survive. Fire suppression activities over the last 100–150 years have largely taken fire out of the system, causing far-reaching changes in habitats and forest health."[1]

Understanding wildfire's sources and behaviors, as well as its role in the *ecosystem*, can help residents to better coexist with it. Throughout the *wildland-urban interface* (WUI), where fire has been and continues to be a natural ecological feature of the *landscape*, wildfire also poses a perpetual threat to human property and safety. At the same time, increasing incidents of accidental human-caused fire simultaneously threaten the integrity of local *wildlands*.

This chapter explains fire history, fire behavior characteristics, fire's relationship with *fuels*, and the fire science used as a basis for planning, preparation, and predicting fire effects on both human and non-human natural communities. This chapter also provides a broad introduction to wildfire in Humboldt County in particular. **The landscapes of Humboldt County have adapted to and evolved with fire, and fire will continue to shape them. Many Humboldt residents understand that it is not a question of if a wildfire will occur here, but rather when.**

Compared to fire patterns in California before European settlement, it is generally accepted that fires in today's post-settlement California are less frequent and more severe. Humboldt County is no exception to this pattern. Wildfire is considered to be one of Humboldt County's most dangerous natural disaster threats. Humboldt County exhibits extreme diversity in its potential for destructive fire, from nil to very high in severity classifications.[2]

The absence of natural fire events due to massive *fire suppression* efforts over recent decades, compounded by historic logging and land-management practices as well as urban and suburban development, has led to an increase in the density and type of live vegetation. This situation has also lead to an increase in the size, amount, and distribution of dead fuel within the county. As a result, forests and *shrublands* are more crowded, trees are unable to retain their vigor, and are more vulnerable to insects, disease, and *stand*-destroying fires. In contrast, frequent, low-intensity surface fires (such as those that occurred historically) would have eliminated most fuels from the forest floor, and maintained more open forests and prairies. Frequent, low intensity fires help keep forests healthy. **A pressing challenge for Humboldt County, and most areas of the West, is how to remove high levels of fuel, while maintaining *ecosystem functions*, processes, and health. This CWPP explores those options.**

Both human activities and other environmental factors affect fire behavior and its consequences. Human factors include home design and landscaping, community wildfire preparedness, land-use planning, and regulation of accidental fire ignitions. Natural features include topography, weather, and the condition and type of vegetation and other fuels. Understanding all the environmental conditions present in an area helps us to formulate practices

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[1] California Forestland Stewardship Program. (2010). *What can you do to protect your property from wildfire?* Retrieved from http://ceres.ca.gov/foreststeward/fire_and_fuels.html

[2] CAL FIRE. (2007). *Fire Resources Assessment Program (FRAP).* [Map showing Fire Hazard Severity Zone ratings within various geographic areas, mapped by county]. Fire Hazard Severity Zones Map. Retrieved from http://frap.cdf.ca.gov/

or actions that can best support individual and community decision making, as well as guide local changes to the environment that are intended to reduce the negative impacts of wildfire. This understanding will also assist Humboldt County *fire resiliency*—the ability to rebound after a wildfire.

II.1.2. Fire Behavior Characteristics

Knowing the attributes of *fire behavior* is important in order to communicate the various threats from any fire and the benefits of mitigation. *Flame length, fire intensity, heat output, rate of spread, residence time,* and whether the fire burns on the surface (forest floor) or crown (tops of trees) are all ways to describe fire behavior. These attributes also help build an understanding of a fire's resistance to *control,* as well as any potential damage and/or positive environmental impacts from fire. The following paragraphs provide an introductory definition to these fire behavior terms.

Surface Fires

On flat or moderate terrain (<30% slopes) in *light fuels*, fires usually burn as a *surface fire*; meaning the flames stay near the ground. Surface fires may advance quickly with short or long residence time and a range of heat output and, as such, they respond well to suppression. A manageable fire, such as occurs more frequently with surface fires, is one of the desired results of *fuel modifications.*

Crown Fire Potential

Crowning activity happens where fire is expected to travel into and possibly consume the crowns—or tops—of trees. *Crown fires* typify a fire of high intensity and exhibit high heat output and rates of spread. These attributes challenge suppression efforts. When a fire burns through tree crowns, countless *embers* are produced and distributed, sometimes over long distances. These embers can start new fires (known as *spot fires*), which can each grow and confound the finest fire suppression forces.

Crown fire initiation (or *torching*) occurs when *ladder fuels* are present, providing a connection between the surface fuels and the crown fuels. The higher the base (the bottom) of the tree canopy away from *surface fuels,* the more difficult it is for crown fires to ignite. Once in the tree *canopy*, crown fires are more likely to spread in dense canopies and conditions involving high wind speeds.

Fire Intensity

Fire intensity describes the amount of heat that is released by flaming *combustion* in a specific unit of time (BTU/ft./sec.[3]). This measurement captures the energy of a fire in any location; it is often confused with fire severity, which is a term describing fire effects *(see below).*

Fire Severity

Fire severity describes the resulting effects of a fire, based on the amount of soil damage and tree mortality. It is determined by observing vegetation and soil conditions after a fire. The relationship between predicted fire behavior characteristics (flame length, heat per unit area, *fireline* intensity, etc.) and fire severity are being explored, but are 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.

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

Flame Length

Flame length is the span of the flame from the base to the tip, irrespective of its tilt. This factor most influences the probability of structure damage and ease of fire suppression. Flame length is highly correlated with fire intensity, which can help predict fire severity. Flame lengths less than four feet long are associated with fires that are more easily controlled—generally with *hand crews*[4]—and are also associated with the widespread low-intensity fires prevalent prior to European settlement. In contrast, flame lengths longer than twelve feet often thwart suppression efforts, and are associated with crown fires seen on the front pages of newspapers. Typically, fuel-management goals aim for conditions in which flame lengths are less than four feet.

Rate of Spread

The rate of spread measures how fast the *leading edge of a fire* advances. A rate of spread that is faster than fireline-building capacity will challenge fire-suppression efforts. High spread rates also indicate the potential for quick changes in fire spread direction, which could endanger firefighters and increase potential damages. High rates of spread in grass can exceed three hundred feet per minute. In rare crown fires, rates of spread can exceed one hundred feet per minute. A more acceptable rate of spread would be one that is slower than the line-building capacity of fire-suppression forces to encircle the fire. Slow-burning fires in forested fuel types spread at a rate of two-to-eight feet per minute.

Residence Time

The residence time of a fire defines how long the leading edge of the 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 a deep *duff* layer, 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 and potential for fire-induced *hydrophobic soils*.

Heat Per Unit Area

Heat per unit area is defined as the total heat produced by flaming combustion in any one location. This does not include long *burn-out times* and smoldering. This factor is especially important in determining soil heating and is a fairly good predictor of potential root damage and *cambium* heating, all indicators of fire severity. Smoldering produces the vast majority of smoke in a fire, but most fire behavior models don't include smoldering combustion.

II.1.3. General Wildfire Environment Descriptions

Fire ecology is the study of fire and its relationship to the physical, chemical, and biological components of an ecosystem. Several ecosystem types are found within Humboldt County, most of which evolved with fire. **Humboldt County is located in a *fire-dependent* environment; fire has played a prominent role in shaping the natural environment here. Wildfire will happen. Exclusion of wildfire is not an option.**

Topography

Topographic features such as *slope* and *aspect*, as well as the overall form of the land, have a profound effect on fire behavior. *Topography* directly and indirectly affects the intensity, direction, and rate of spread of wildfire. Fires burning in flat or gently sloping areas tend to burn more slowly, and to spread in a wider ellipse than fires on steep slopes. Streams, rivers, and

[4] *Hand crews* are diverse teams of career and temporary wildland firefighters

canyons tend to channel local *diurnal* and general winds, which can accelerate the fire's speed and affect its direction, especially during *foehn* (warm, dry, and usually strong) wind events. Local winds are greatly affected by topography, which "bends the wind" as it flows around or over landforms. Topography also causes daily upslope and downslope winds. The topographic features of aspect and elevation affect vegetation. Solar exposure affects *fuel moisture*.

Humboldt County has a mixture of rugged mountains, rolling hills, and broad valleys. Elevations within the county range from the coastal sand-swept streets of Manila, just 13 ft. above sea level, to Salmon Mountain, the county's highest peak at 6,962 ft. (in the Trinity Alps Wilderness of Six Rivers National Forest). Due to the remoteness and steepness of slopes within the county, fire equipment and personnel can be limited in their access to wildfires. *Drainages* can act as *chimneys*, which can move wind and fire very quickly up a gentle or steep slope. This adds significant fire risks to Humboldt County communities.

Geological Features

The bedrock geology of Humboldt County is divided generally into two provinces: the Klamath Mountains province in the northeast, and the Coast Ranges province in the central and southwest portion of the county. The dividing line between the two provinces is the South Fork Mountain Ridge, which separates the Trinity River *basin* from the Mad River and Redwood Creek drainages.

The Klamath Mountains province is an area beginning in northeastern Humboldt County and extending east of the County line with high alpine peaks, some attaining elevations of 8,000 feet or more. The province is drained by the Klamath and Trinity Rivers and farther north by the Smith River. Rocks in the Klamath Mountains province are generally older than those in the Coast Ranges. Rocks of sedimentary origin such as sandstone, chert, slate, and schist occur abundantly, with occasional granite intrusions.

The Coast Ranges province is the dominant geologic province in the county, trending northwest and drained by the Mad, Eel, and Mattole River drainages. The Franciscan and Yager complexes dominate inland, with sand and other alluvial deposits dominating in the lower reaches of the river basins and the area surrounding Humboldt Bay.

Figure II.1-1. Topography: Aspect Map

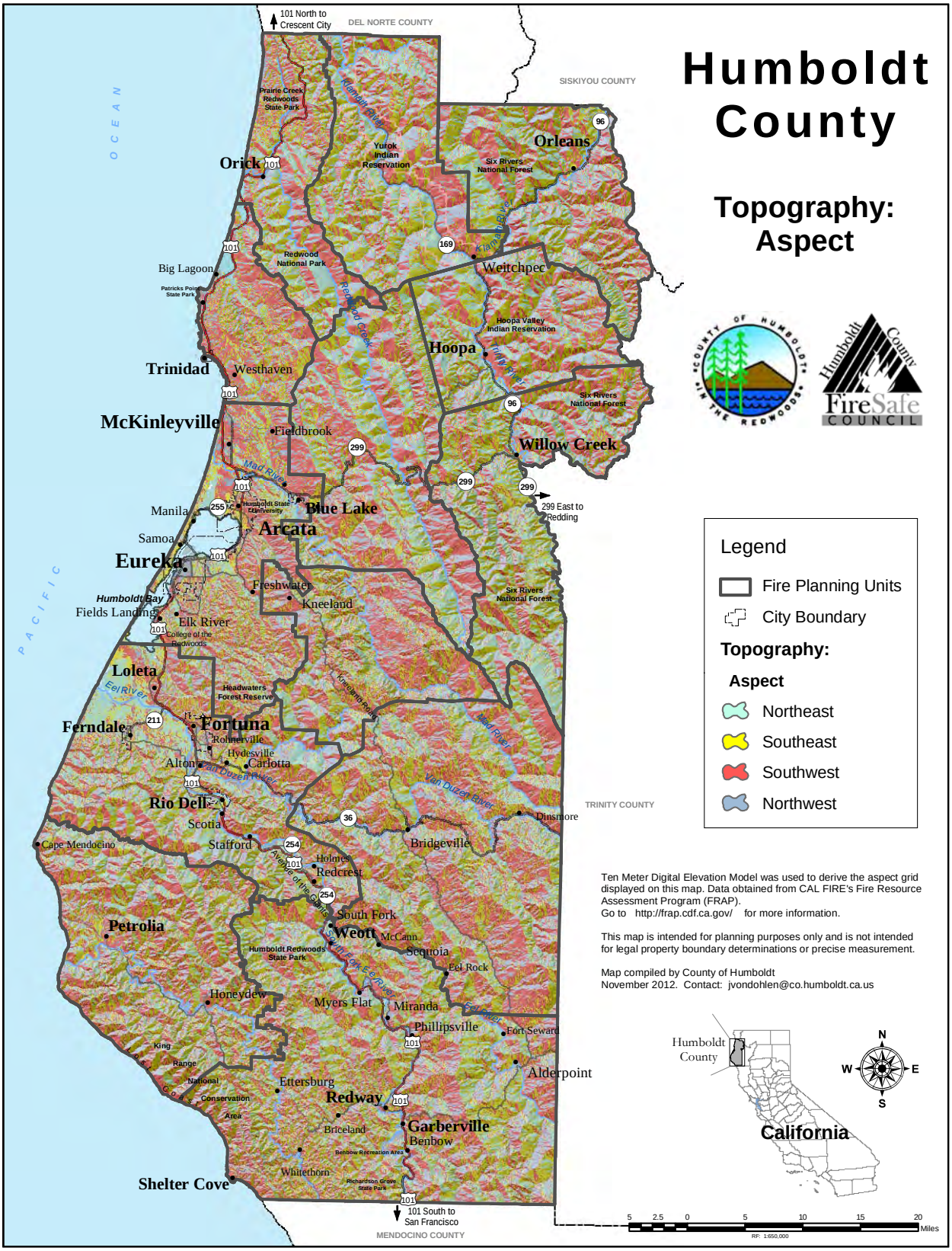
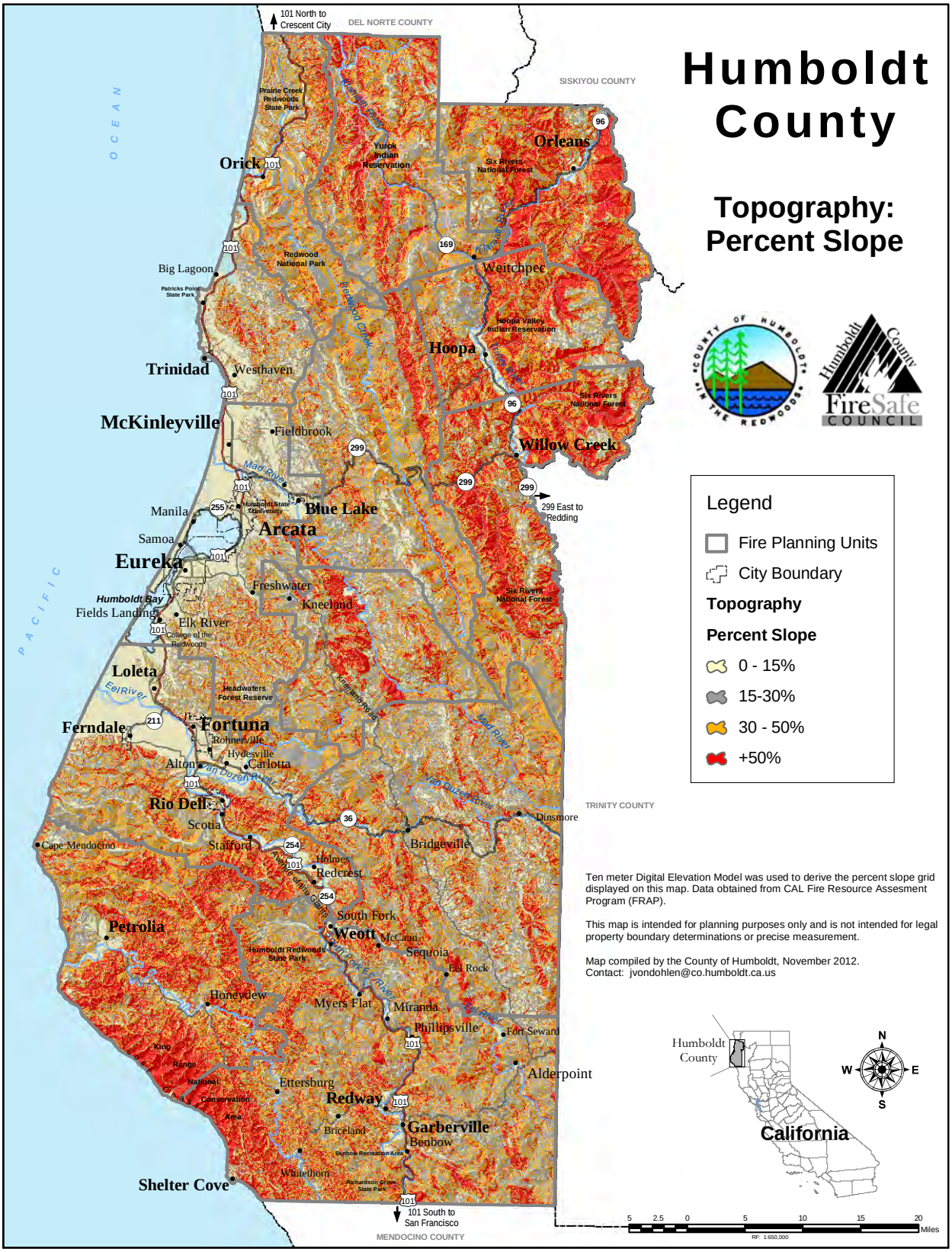


Figure II.1-2. Topography: Percent Slope Map



Weather

Weather conditions significantly impact the potential for fire ignition, as well as rates of spread, intensity, and the direction(s) a fire burns. Wind, temperature, and *relative humidity* are the weather variables used to predict fire behavior.[5] *Fire weather* refers to weather elements that influence fire *ignition,* behavior, and suppression; these elements include temperature, relative humidity, wind speed and direction, precipitation, atmospheric stability, and the presence of *aloft* (or upper-level) *winds.*

Humboldt County is an area of moderate temperatures and considerable precipitation. Temperatures along the coast vary only 10 degrees from summer to winter, although a greater range is found over inland areas. Temperatures of 32ºF or lower are experienced nearly every winter throughout the county, and colder temperatures are common in the interior. Maximum readings for the year often do not exceed 80ºF on the coast, while readings over 100ºF occur frequently in the mountain valleys.

In most years, rainfall is experienced each month of the year, although amounts are negligible from June through August. Seasonal totals average more than 40 inches in the driest area, and exceed 100 inches in the wettest. Because of the moisture and moderate temperature, the average relative humidity is high.

Largely as a result of proximity to the cool Pacific Ocean, the adjoining coastal area has a cool, stable temperature regime. With increasing distance from the ocean, the marine influence is less pronounced, and inland areas experience wider variations of temperature and lower humidity. This marine influence can reduce fire hazards to those areas of the county that are affected by the moist air.

> "The interesting relationship between fog-stratus and regional temperature is known to those who have lived on the redwood coast for any length of time. Cool water upwells offshore as the California current flows southward. Warmer air moving over this humid surface is chilled and condenses. When interior temperatures rise, this marine layer of air is pulled inland and gets forced against the coastal mountains and is vertically contained under an inversion associated regional high pressure. Given this persistence of this pattern during most years' fire season, the local occurrence probability of fog-stratus helps define the fire hazard as well as the vegetation that is found there….
>
> "It is common to observe the strongest fire activity in the interior Klamath mountains on days when this coastal fog-stratus pattern is best developed. Variation in fog-stratus over centuries can alter the fire occurrence probabilities…"[6]

Inland, thunderstorm activity typically begins in June with wet storms. These storms often turn dry—with little or no precipitation reaching the ground and are accompanied by lighting—as the season progresses into July and August. The combination of these dry thunderstorms and the lack of marine influence increase fire hazard in the eastern portion of the county.

Wind is considered the most variable and difficult weather element to predict. It increases the *flammability* of fuels (live or dead vegetation, as well as human-built structures) by removing

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[5] Husari, S., Nichols, T., Sugihara, N.G. & Stephens, S.L. (2006). Fuel management. In Sugihara, N.G., van Wagtendonk, J., Shaffer, K.E., Fites-Kaufman, J., & Thode, A.E. (Eds.). *Fire in California's Ecosystems.* (pp. 444–465.) Berkeley: University of California Press.

[6] Coast Redwood Ecology and Management. (n.d.) *Climate Change in Coast Redwood Forests.* Retrieved December 13, 2012, from www.redwood.forestthreats.org/climatechange.htm

moisture through evaporation, by pre-heating fuels in a fire's path, and by increasing spotting distances (the distance at which a spot fire might be ignited by a flying ember). Wind velocities and directions may vary across vertical gradients, with somewhat different impacts on fire behavior. The direction and velocity of surface winds can directly control the direction and rate at which the fire spreads. Winds that blow more than 20 ft. above the ground can carry embers and *firebrands* downwind, causing spot fires to precede the primary front.

Prevailing winds during Humboldt County's *fire season* (generally June through October) are out of the northwest. In July and August local winds (slope winds and sea breezes) predominate, with the Pacific jet stream weak and well to the north. By September, weak to moderate north-to-northeast winds can become more prevalent. These winds are more critical for bringing in moist ocean air than in the late spring. The more easterly flows in particular are problematic, being significantly drier. These drier winds are a major factor in many if not most of the larger fires and more extreme fire behavior locally, combined with their usual coincidence with the annual low ebb of both live and dead fuel moistures.

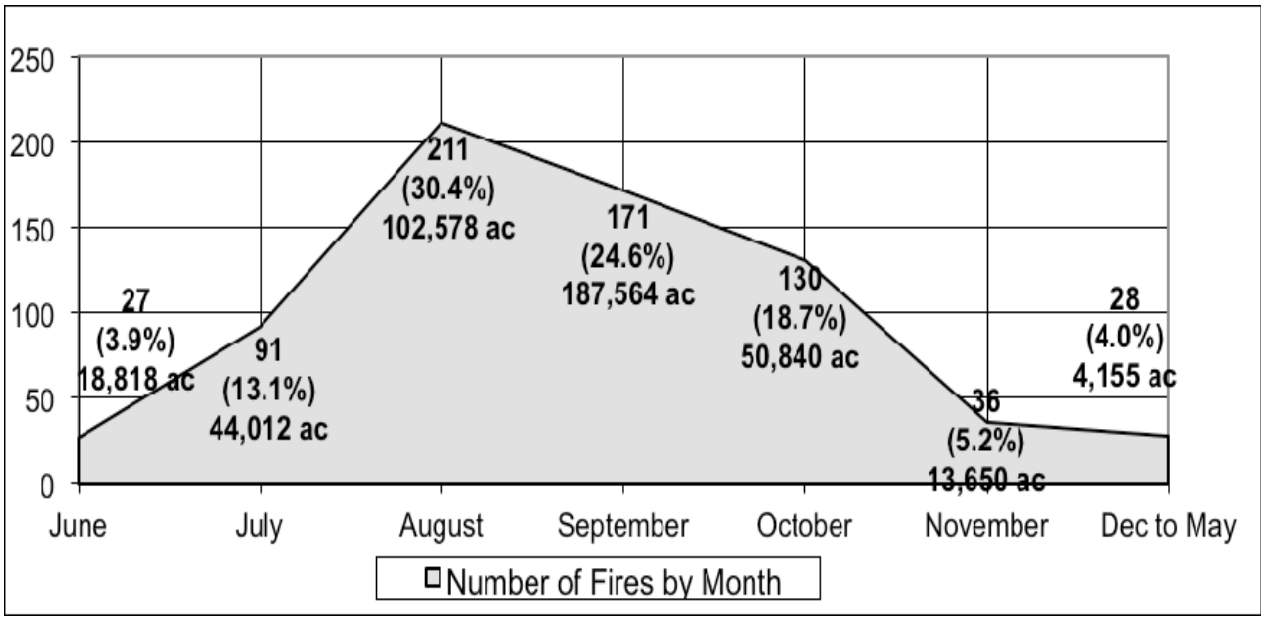
Fires during foehn events—or subsiding winds—usually result in extreme fire behavior because they are particularly strong and dry, thus reducing fuel moistures. This leads to easier ignitions and increased fire intensity and rate of spread. Foehn winds can also cause extreme fire behavior at night, when fires normally die down.

Weather conditions can change rapidly as upper-level wind currents and pressure systems in the western states shift locations, and both dry and wet frontal systems move through the mountainous terrain. Frontal winds associated with low-pressure systems moving across the area can create hazardous fire conditions. Winds in advance of the frontal system can reach speeds exceeding 60 mph over ridges. Winds associated with thunderstorms are particularly erratic, radiating in all directions from the center of the storm. Atmospheric instability dilutes and disperses smoke but also tends to increase fire intensity, analogous to opening the damper on a stovepipe. Wind in general is an important factor in initiating and maintaining crown fires.

A phenomenon worth noting is that which occurred with the Honeydew Fire (2003) in the King Range National Conservation Area. Instead of the usual and expected gradual cooling and humidity accumulation throughout the night, around midnight temperatures increased and relative humidities dropped for several hours, resulting in a more active nocturnal burning period. This increased nocturnal burning effect was observed in the Basin Fire at Big Sur (2008) as well, also a coastal area with similar topographical elements.

The following graph shows the average number of fires, the annual percentage, and the total acreages burned by month for the years 1908-2011. As explained above, Humboldt County's hottest and driest times of the year—as well as the time with the most inland lightning ignitions—are during the late summer and fall months. These are when we see both the most fires burning every year here, as well as the most total acreage burned by month.

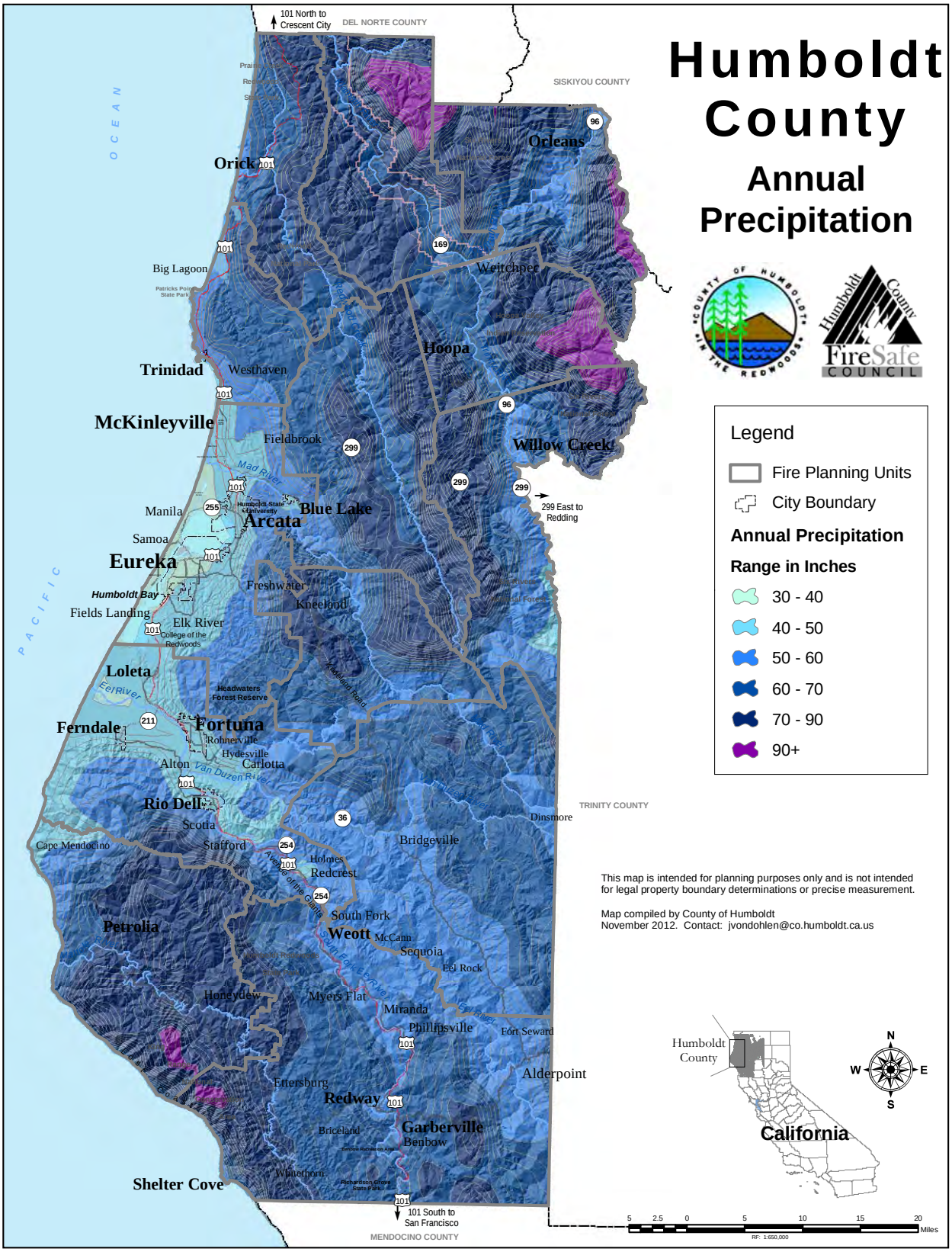
Figure II.1.3. Humboldt County, Average Number of Fires and Acreage by Month, 1908-2011[7]



The National Weather Service provides daily fire weather forecasting for Humboldt County from their Eureka office. All fire weather forecasts are available at the Eureka office main web page: http://www.wrh.noaa.gov/Eureka.

7 CAL FIRE. (2007). *Fire Resources Assessment Program (FRAP).* [Map showing Fire Hazard Severity Zone ratings within various geographic areas, mapped by county]. Fire Hazard Severity Zones Map. Retrieved from http://frap.cdf.ca.gov/

Figure II.1-4. Precipitation Map



Climate Change and Wildfire in Humboldt County[8]

In 2010, Forest Service ecologists summarized current research regarding climate change and its impact to Six Rivers National Forest and surrounding areas. The paper, entitled, *A summary of current trends and probable future trends in climate and climate driven processes for the Six Rivers National Forest and surrounding lands*, is an excellent resources for those interested in the impact of changing climate on Humboldt County, and what that might mean in terms of wildfire.

Local weather data from throughout the Six Rivers National Forest (Orleans, Gasquet, Willow Creek, and Mad River) show that most of the Forest "has experienced increases in mean annual temperature of about 1ºC (1.8º F) over the last 3/4 century, although some coastal areas have seen a slight decrease in temperature." Temperature increases are most dramatic during the nighttime (minimum temperatures) in interior areas.[9] They also found that "year-to-year variability in precipitation has increased over the course of the last century."[10]

Perhaps most important, in terms of wildfire:

> "Analyses of hydrometeorological data from the lower Klamath Basin show a decrease in the percentage of precipitation falling as snow and accelerated snowpack melt, resulting in earlier peak runoff and lower base flows (Hamlet et al. 2005; Mote et al. 2005; Regonda et al. 2005; Stewart et al. 2005; Mote 2006; Van Kirk and Naman 2008)."[11]

Lack of sufficient snowpack to provide adequate water flows in summer and into fall—during the times of historic fire season *(see Wildfire Risk and Fire History section below)*—can substantially increase both local fire hazard and fire risk.

> "Although climate models diverge with respect to future trends in precipitation over NW California, there is widespread agreement that the trend toward lower SWE [snow water equivalent] and earlier snowmelt will continue (Leung and Wigmosta, 1999; McCabe and Wolock, 1999; Miller et al. 2003; Snyder et al. 2004; Barnett et al. 2005; Zhu et al. 2005; Vicuna et al. 2007; Van Kirk and Naman 2008)."[12]

With respect to forest fires, the authors state:

> "Data on forest fire frequency, size, total area burned, and severity all show strong increases in California over the last two to three decades. Westerling et al. (2006) showed that increasing frequencies of large fires (>1000 acres) across the western United States since the 1980's were strongly linked to increasing temperatures and earlier spring snowmelt. Northern California forests have had substantially increased wildfire activity, with most wildfires occurring in years with early springs (Westerling et al. 2006). This increase is likely attributable to both climate and land-use effects. Large percentage changes in moisture deficits in Northern California forests, according to Westerling et al. (2006), were strongly associated with advances in the timing of spring, but this area also

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[8] This section is based on the paper: Butz, R.J. and Stafford, H. (2010). *A summary of current trends and probable future trends in climate and climate driven processes for the Six Rivers National Forest and surrounding lands.*.USDA Forest Service Pacific Southwest Region. Retrieved from www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5251124.pdf

[9] Butz & Stafford. (2010.) p. 1.

[10] Butz & Stafford. (2010.) p. 2.

[11] Butz & Stafford. (2010.) p. 8.

[12] Butz & Stafford. (2010.) p. 10.

includes substantial forested area where fire exclusion, timber harvesting, and succession after mining activities have led to increased forest densities and fire risks (McKelvey et al. 1996; Gruell 2001).

"During 1987-2008, Miller et al. (2010) found [on the four National Forest of NW California] that the percentage of high-severity fire in conifer-dominated forests of smaller average diameter and lower percent cover was generally higher than in forests of larger diameter and higher cover.

And that

"forests near the coast were not more susceptible to high severity fire than interior forests, but the size of forest patches burned at high severity was positively related to proximity to the coast."[13]

The authors conclude their analysis as follows:

"It is important to note that although much of northern California is projected to experience more frequent and severe fires under future scenarios, Lenihan et al. (2003, 2008) predict a decrease in mean annual area burned for coastal northern California (Fig. 19). Lenihan et al. simulated changes in mean annual area burned for the future period based on changes in vegetation types. For the northwest coast of California, they projected no significant increase in grass or shrub vegetation types that promote higher rates of fire spread in their models. Data from Miller et al. (2010) suggest that fires in the Klamath Mountains, particularly in wetter areas along the western slope, are not experiencing a trend in increasing fire severity (although the overall area of high severity fire is increasing due to increases in annual burned area). This is likely due to the more maritime climate, the importance of the maritime inversion layer over the area in the summer, and the strong influence of topography on fire behavior. Increased upwelling in the California Current under increased CO_2 conditions may intensify fog development and onshore flow during the summer months (Bakun 1990, Snyder et al. 2003), potentially further buffering wetter regions of the North Coast from intensifying fire regimes."[14]

As described above, current data shows that temperatures, precipitation, and fire frequency and severity are changing in Humboldt County and throughout California. What that could mean regarding wildfire in Humboldt County is less predictable fire behavior. There may be more frequent and more erratic fires inland, perhaps with a decrease of wildfire along the coastal areas of the county. Such changes in fire behavior make community-based fire safety efforts all the more important *(see Chapter II.4. Community Preparedness and Part V. Fire-Safe Communities for more information).*

Hydrology

The *hydrology* of an area describes the flow of water across and through the land. Lakes, ponds, streams, wetlands, and springs are just a few examples of an area's hydrological features. The presence of these features tends to increase the humidity of a local site and can make it more resistant to the effects of fire. In the case of ponds and lakes, their availability as water sources for fire suppression is also important.

Humboldt County's hydrologic features are abundant. Humboldt Bay is nestled into the coast at the county's midpoint, and is the only deep-water port between San Francisco and Coos Bay,

[13] Butz & Stafford. (2010). p. 8.

[14] Butz & Stafford (2010.) pp. 13-14.

Oregon. Thousands of waterways flow through the region, from small ephemeral streams to large creeks and rivers, eventually making their way to the Pacific Ocean. Noteworthy rivers running through the county are the South Fork Eel, Eel, Mattole, Van Duzen, Mad, South Fork Trinity, Trinity, and the Klamath. Redwood Creek is a significant watershed that runs through half the length of the county. These watersheds can be grouped into four larger basins: Klamath-Trinity, Mad-Redwood, Eel, and Mattole.

Vegetation and Fuels[15,16]

Vegetation usually provides most of the fuel that feeds wildfire, along with other flammable material on site (such as homes). It is highly variable in many respects, including size, height, density, and relative volatility/flammability. The volume, character, distribution, and arrangement, relative presence of volatile oils, and *moisture content* of fuels are all factors that greatly influence fire behavior.

Fuel includes anything that can burn: grass, shrubs, and trees, as well as fences, decks, furniture, cars, and houses. These can be described as *fuel models (see below)*, or in terms of sizes, volumes, and arrangement: light fuels (e.g. grass, foliage, kindling-size twigs, or baskets and brooms), medium fuels (e.g. shrubs, branches, or fences), or *heavy fuels* (e.g. logs, tree trunks, or human-built homes). Light, medium, and heavy *fuel loadings* describe fuel volume. Fuel arrangement is commonly discussed in terms of continuity—both horizontal and vertical.

Nearly every major *fuel type* in California exists within Humboldt County. Examples include grasslands, oak woodlands, *brush*, mixed *conifer forests*, and hardwood forests. A significant portion of Humboldt County is comprised of temperate rainforest (designated as such due to the microclimate of high moisture, humidity, and fog created by stands of ancient trees such as coastal redwoods), with a large quantity of rainfall each year. Because of this ecosystem diversity, Humboldt County can experience virtually any type of wildfire that can occur in California, from fast-spreading grass fires to long-duration forest fires (*for more information, see Fuel Models below).*

The virtual exclusion of widespread low- to moderate-severity fire has affected the structure and *composition* of *vegetation types*. Conifer stands are generally denser, mainly in small- and medium-size classes of shade-tolerant and *fire-sensitive* tree species. Fuels have become more vertically continuous, contributing to more spatially homogeneous forests. Selective cutting of large *overstory* trees and the relatively warm, moist climate during much of the twentieth century may have enhanced conditions for tree seedling establishment.

A relatively recent and significant development in the consideration of local fuels is the incidence of *Sudden Oak Death* (SOD) within some parts of Humboldt County.[17] SOD is a caused by *Phytophthora ramorum*, an invasive forest pathogen introduced to California in the mid-1990s through the horticultural plant trade (especially through rhododendron, camellia, and viburnum species). It was first identified in Humboldt County in 2002 in the Redway area. It has

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[15] Harrel, R.D. & Teie, W.C. (2001). *Will Your Home Survive? A Winner or Loser? A guide to help you improve the odds against Wildland Fire.* (pp. 17–26.) Deer Valley Press, (www.deervalleypress.com).

[16] Anderson, H. E. (1982). Aids for Determining Fuel Models for Estimating Fire Behavior. *General Technical Report INT-122.* Ogden, UT: U.S. Department of Agriculture (USDA), Forest Service, Intermountain Forest and Range Experiment Station.

[17] For more information on Sudden Oak Death in Humboldt County, see: Valachovic, Y., Lee, C., Glebocki, R., Scanlon, H., Varner J.M., & Rizzo, D.M. Understanding The Long-Term Fire Risks In Forests Affected By Sudden Oak Death. In: Frankel, S.J., Kliejunas, J.T., Palmieri, K.M. (2010). Proceedings of the Sudden Oak Death Fourth Science Symposium. *General Technical Report PSW-GTR-229.* (pp. 262-270.) Albany, CA: USDA, Forest Service, Pacific Southwest Research Station.

since spread in southern Humboldt and occurs primarily in the South Fork Eel River watershed north to Weott. Other sites are found near Eel Rock, Blocksburg, and in the Redwood Creek watershed north of Highway 299.

This pathogen has caused widespread dieback of tanoak (*Notholithocarpus densiflorus*) and several other oak species throughout coastal California counties. Affected areas can have a significantly higher fire hazard due to higher proportions of *dead fuels* of all sizes, and a prevalence of snags.[18] This disease spreads easily by wind-driven rain events; the affected area is anticipated to grow substantially. Recent research has helped to characterize the nature of the risk and will help to guide firefighter response.[19]

Several factors make the spread of SOD a particular concern here:[20]

- The pathogen continues to spread in North Coastal wildlands. For example, one small infestation detected in Redway in 2002, has since grown to include patches scattered over several dozens of square miles, directly impacting over 14,000 acres. The pathogen could continue to spread and eventually affect tanoak throughout much of the North Coast.
- Ecologists expect Sudden Oak Death's impacts to area forest ecosystems (e.g. timber, tribal, wildlife, fire hazard, aesthetics, etc) to be significant.
- The wildlands and natural resources of Humboldt County are significant both in terms of their total acreages and in areas at high risk for the disease.[21]
- Concern continues to mount in Oregon and Washington regarding further pathogen spread from California and particularly whether Humboldt County will be the northern gateway for spread of the disease.
- A limited time window from the point of detection of a new wildland infested area exists for early response and pathogen control.

Given these facts, the effect of Sudden Oak Death on the wildfire environment in Humboldt County is significant. The disease and its ramification in local ecosystems must be taken into account in fuel-reduction and other *ground-disturbing* activities in the County to minimize its negative effects.

An aerial survey project conducted in 2006 mapped mortality of SOD hardwood hosts (primarily tan oak and coast live oak) and found 4,138 acres of tree mortality in Humboldt County.[22]. Mortality of conifers and hardwoods has resulted in areas of heavier fuel loadings and

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[18] *Snags* are standing dead trees, which can be very flammable. They are also often teeming with life such as insects and woodpeckers, and hence an important part of local forest biodiveristy.

[19] Valachovic, Y., Lee, C., Scanlon, H., Varner, J.M., Glebocki, R., Graham, B.D., & Rizzo, D.M. (2011). Sudden oak death-caused changes to surface fuel loading and potential fire behavior in Douglas-fir-tanoak forests. *Forest Ecology and Management, 261, 1973-1986*. Retrieved from www.cafiresci.org/storage/papers/psw.2011.valachovic.SODcausedchanges.FEM.pdf

[20] Valachovic, Y., personal communication, August 31, 2012.

More information can be found at either at: University of California Cooperative Extension (UCCE): Humboldt – Del Norte Counties. (2012). *Sudden Oak Death.* Retrieved from http://cehumboldt.ucdavis.edu/Sudden_Oak_Death/ (UCCE Humboldt coordinates monitoring and management of the disease under grant funds), *or:* California Oak Mortality Task Force. (n.d.). *What is Sudden Oak Death?* Retrieved from www.suddenoakdeath.org

[21] *For more information, see:* UCCE: Humboldt – Del Norte Counties. (2012). Disease Locations and Pathogen Monitoring. Retrieved from http://cehumboldt.ucdavis.edu/Sudden_Oak_Death/Disease_Locations_and_Pathogen_Monitoring/

[22] Bell, L. & Fischer, L. (2006). *2006 Accomplishment Report: Aerial & Targeted Ground-Based Monitoring for Sudden Oak Death.* USDA Forest Service, Pacific Southwest Region, State and Private

increased flammability. Causes of mortality include insect damage, diseases (such as SOD), blow-downs, and damage from past fires. Mortality on private timberlands has also been observed due to active removal of harvestable material. Such disturbances result in changes in the ecosystem function, which often means mortality of trees and increased fuel loads for potential fires.

Fuel Models

A fuel model is a standardized description of fuels available to a fire, based on the amount, distribution, and continuity of vegetation and wood.[23] Among other things, fuel model information helps fire suppression agencies determine what kind of fire might be expected in different areas. Fuel models distinguish between vegetation such as tall and short grass, timber with and without an *understory*, and oak woodland with and without understory vegetation. Fire managers use fuel models within the Fire Behavior Prediction System (FBPS)—called FBPS #1, 4, 10, etc.—to forecast how fast a fire will spread, how damaging the fire might become (in terms of fire intensity), or whether it is likely to *torch* in the area. Information regarding fuel volumes and fire behavior descriptions is available from the USDA Forest Service publication *How to Predict the Spread and Intensity of Forest and Range Fires*.[24]

Fuel models describe vegetation structure in addition to typical *species composition*; structure largely determines the fuel that will actually support the fire. The understory is more important than the overstory. The most significant factor is the amount and distribution of smaller-diameter fuels because these materials generally contribute to the spread of wildfires. A grassy field with oak trees that cover less than one-third of the slope would be classified as a grass fuel model, because the contribution of oak leaves and branches to fire behavior may be negligible (due to the minor amount of *leaf drop* or the relative height at which the first branches grow above the ground). Similarly, where brush covers less than one-third of a conifer stand, it would be classified as a conifer stand. The amount and size of dead material distinguishes among the three types of conifer fuel models. Another important factor in fuel models is the amount of dead *biomass* and the ratio of live-to-dead material where there are significant brush and tree stands. Dead biomass contributes fine fuel *litter* and carries flames more readily.

The table below shows the fuel models present in Humboldt County and their respective acreages. Surface fuels (based on these same fuel models) are illustrated in the map below, in Figure II.1-5.

Forestry, Forest Health Protection program. Retrieved from http://www.suddenoakdeath.org/pdf/2006SODAccomplishmentReport.pdf

[23] National Park Service. (2012 December 13). *Glossary of Fire Terms.* Retrieved from http://www.nps.gov/seki/naturescience/fic_firegloss.htm

[24] Rothermel, R.C. (1983). How to predict the spread and intensity of forest and range fires. *General Technical Report INT-143.* Ogden, UT: USDA, Forest Service, Intermountain Forest and Range Experiment Station.

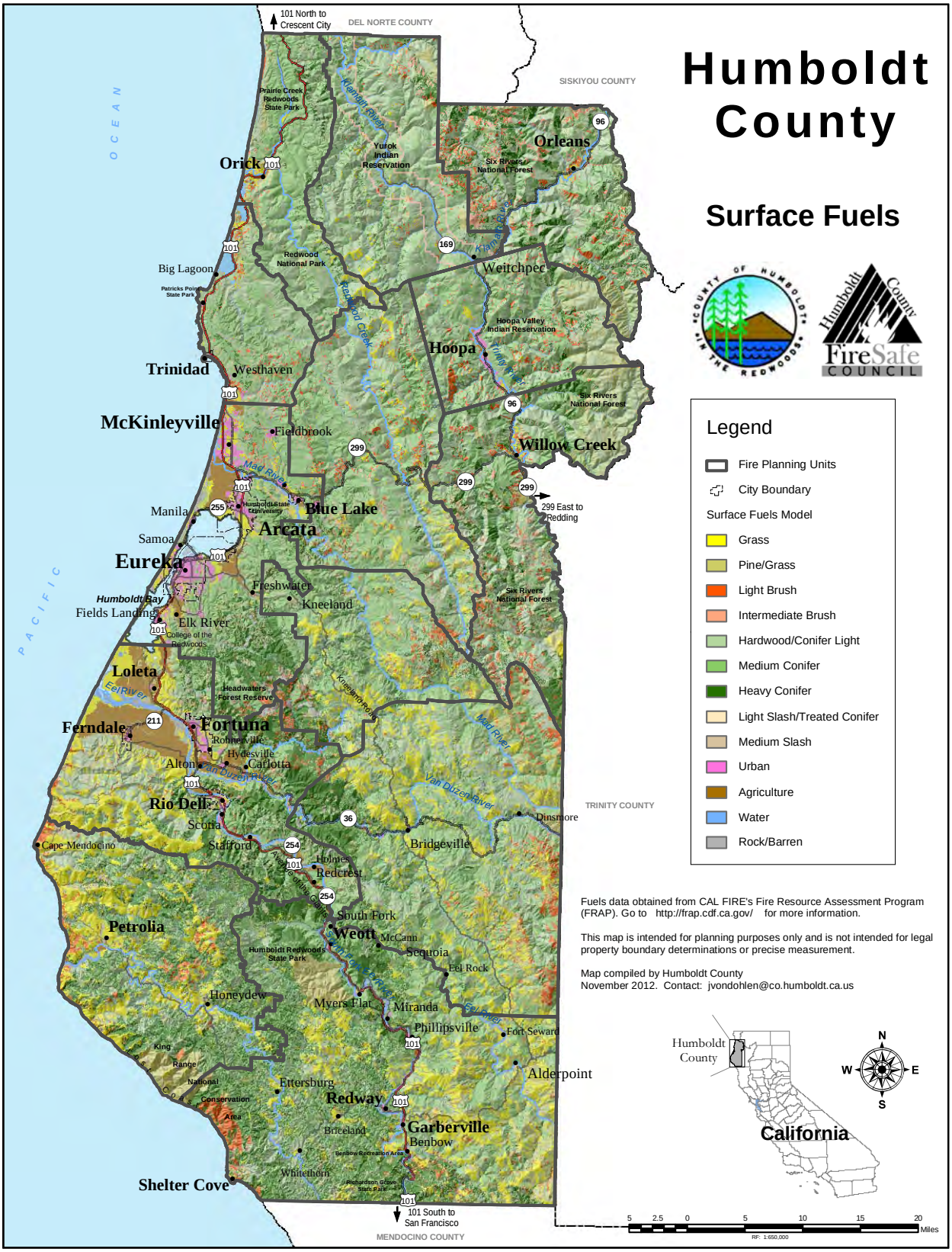
Figure II.1-5. Fuel Models Found in Humboldt County

Fuel Model Description	Typical Fuel Model[25, 26]	Acres and Percentage found in Humboldt County
Grass	1	233,415 (10%)
Pine/Grass	2	141,129 (6%)
Light Brush	5	89,295 (4%)
Intermediate Brush	6	7,497 (less than 1%)
Hardwood/Conifer Light	8	624,514 (27%)
Medium Conifer	9	748,023 (%33)
Heavy Conifer	10	295,454 (13%)
Light Slash/ Treated Conifer	11	9,353 (less than 1%)
Medium Slash	12	44,144 (2%)
Non-Burnables such as Urban, Agriculture, Water, and Rock/Barren	28, 97, 98, and 99	99,398 (4%)
Source: CAL FIRE's Fire Resource Assessment Program (FRAP)		

[25] There is a wide variety of fuel volume, structure, and size class distribution within vegetation types; fuel models should be determined by site-specific conditions. Fuel models can be classified by comparing photographs of fuel models with on-site conditions (Anderson 1982), by using expert opinion to translate vegetation types to fuel models, or by using a "key" provided in Rothermel (1983).

[26] Anderson, H.E. (1983). Predicting Wind-driven Wild Land Fire Size and Shape**.** *Research Paper INT-305.* (p. 26.) Ogden, UT: USDA, Forest Service, Intermountain Forest and Range Experiment Station.

Figure II.1-6. Surface Fuels Map



The following is a description of each of the Fuel Models found in Humboldt County.

Model 1 – 2 Grass Models

Fuel Model 1 – This model contains annual and perennial short grasses, about one foot tall, which are fairly uniform and homogenous. Less than 1/3 of the area contains other types of vegetation such as trees and shrubs. This fuel model is most commonly found distributed throughout the large ranchlands in the southwestern and southeastern portions of the county. Grazing is the predominant use of these areas. There is approximately 3/4 tons[27] per acre of fuel at a depth of about one foot. *Fire spread* is governed by the fine, very porous, and continuous *herbaceous fuels* that have cured or are nearly cured. Fires are surface fires that move rapidly through the cured vegetation and contain flame lengths approximately 4-feet high.

Fuel Model 2 – This model is dominated by grasses approximately one- to two-feet tall. The grasses within this model generally occur under an open, wooded timber canopy. This fuel type constitutes a very small percentage of the land area within the county with concentrations located on Six Rivers National Forest lands at high elevations to the east of the Hoopa Valley Indian Reservation and within the King Range National Conservations Area and Humboldt Redwoods State Park. There is approximately four live/dead tons of <3-inch fuel per acre at a depth of about one foot. Also occurring within the 1-ft. *fuel bed* are approximately two tons of 1/4-inch dead material as well as a 1/2-ton of live (foliage) material. Fire spread occurs in the live/dead fine surface materials. Areas with high *fuel loads* associated with the hardwood and conifer component can be intense and cause firebrands. Fires within this model can produce flames over 9 feet.

Model 5 – 6 Shrub Models

Fuel Model 5 – This model consists of stands of mature shrubs with little or no dead material component. Most of the fuels within this model are alive, consisting of green vegetation that is not very volatile. This fuel model occurs on poor sites, on recent burns, and may occur under tree canopies. There are smatterings of this fuel model throughout the county collectively adding up to only about 4% of the land area. A coastal strip with concentrations near Orick, Big Lagoon, Cape Mendocino, and the southern portion of the King Range National Conservation Area include varying combinations of coyote brush, manzanita, and/or lupine; sometimes referred to as coastal scrub. Inland areas, particularly along the eastern edge of the county, are sprinkled with patches of this fuel model.

This fuel model consists of approximately 3.5 live/dead tons of <3-inch fuel per acre to a depth of about two feet. Also occurring within the 2-ft. fuel bed are approximately one ton of 1/4-inch dead material as well as 2 live tons per acre. Fires in this fuel model generally do not burn intensely or rapidly, due to high concentration of live material. Flames can reach heights of over 13 feet.

Fuel Model 6 – This model consists of vegetation that is taller and more flammable than that of Fuel Model 5. In many instances a Fuel Model 5 will evolve into a Fuel Model 6 by the latter part of the summer. Only one percent of the county is classified with this fuel model, showing up in a few patches on Six Rivers National Forest lands in the northeastern corner of the county and southwest of Willow Creek; this is likely brush related to logging operations in the mixed conifer forests of those areas. There is approximately 6 live/dead tons of <3-inch fuel per acre to a depth of about 2.5 feet. Also occurring within the 2.5-ft. fuel bed are approximately 1.5 tons of 1/4-inch

[27] This includes both live and dead vegetation. Dead vegetation, e.g. dead branches, responds quickly to weather conditions while live fuels, e.g. flowering branches, are slower to change with weather and are less flammable.

dead material per acre. Fires in this model will burn in the foliage of standing vegetation, but only when wind speeds are greater than eight mph. Fires within this model can produce flames about 12-feet tall.

Model 8 – 10 Timber Litter Models

Fuel Model 8 – This model consists mainly of needles, leaves, and occasionally twigs below a conifer or hardwood canopy. Approximately 27% of the county can be associated with this fuel model making it second only to Model 9 in amount of area covered. Coastal areas are dominated in the north by coast redwood and in the south and east by conifer/hardwood forests with less of an understory than Fuel Model 9. There are approximately 5 live/dead tons of <3-inch fuel per acre to a depth of about 0.2 feet. Also occurring within the 0.2-ft. fuel bed are approximately 1.5 tons of 1/4-inch dead material per acre. Fires within this model are generally slow burning and of low intensity within the compacted vegetation, although the fire may encounter an occasional *"jackpot"* or heavy fuel concentration that can flare up. Fires in this model do not pose a control threat unless high temperatures, low relative humidity, and high winds allow the fire to spread into the canopy. Fires within this model can produce flames about 2 feet tall.

Fuel Model 9 – This model is similar to Fuel Model 8, except it has more fine fuels, which increase fire severity. This model represents 33% of the county and the associated vegetation type varies depending on geographic location. Coast redwood, Douglas-fir, and spruce are found in coastal areas. Inland areas classified under this model are dominated by Douglas-fir intermingled with hardwoods. There is approximately 3.5 live/dead tons of <3-in. fuel per acre to a depth of about 0.2 feet. Also occurring within the 0.2-ft. fuel bed are approximately 2.9 tons of 1/4-inch dead material per acre. Autumn fires in the hardwoods in this model are predictable, but high winds will actually cause higher rates of spread than predicted because of spotting (spot fires) caused by rolling and blowing leaves. Concentrations of dead and *downed woody debris* will contribute to possible torching, crowning, and spotting. Fires within this model can produce 7-foot flames.

Fuel Model 10 – This model consists of a shrub, sapling, or immature tree understory with a diseased and/or mature overstory. Much of the county's old growth forests fall into this category with a mature closed canopy and a thick, lush understory with large amounts of biomass. The largest concentration of this type is located along the South Fork Eel River and the lower Van Duzen River including parts of Humboldt Redwoods State Park, the Avenue of the Giants, and Humboldt Redwood Company and Green Diamond Resource Company lands. The predominant forest type falling into this fuel model is older coast redwood, with patches of Douglas-fir located in the northeastern portion of the county. There is approximately 12 live/dead tons of <3-inch fuel per acre to a depth of about 1 foot. Also occurring within the 1-ft. fuel bed are approximately 3 tons of 1/4-inch dead material as well as 2 live tons per acre. Fires in this model burn with a moderate rate of spread and can be very intense. *Crown scorch* (and/or torching) of individual trees and spot fires are common within Fuel Model 10. This fuel model poses the most control problem of all the fuel models within the three timber litter models. Fires within this model can produce flames over 100 feet high in extreme conditions.

Model 11 – 12 Logging Slash Models

Fuel Model 11 – This model consists mainly of logging slash produced by *thinning* operations or light, partial cuts within mixed conifer or hardwood stands, as well as herbaceous material intermixed with *slash*. Only 1% of the county is characterized by this model and it is lightly sprinkled over the landscape. It is found in many locations associated with past timber harvests. There is approximately 11.5 live/dead tons of <3-inch fuel per acre to a depth of about 1 foot. Also occurring within the 1-foot fuel bed are approximately 1.5 tons of ¼-inch dead material, and there is typically no live material within the fuel bed. Fires in this model generally have a low rate

of spread and burn at low intensities. Fire potential can be limited by wide spacing between light loads of mostly fine fuels, as well as shade from the remaining overstory. Fires within this model can produce flames 3.5 feet in length.

Fuel Model 12 – This model consists of heavy amounts of slash produced either by clearcuts, medium- or heavy-partial cuts, or heavily thinned mixed conifer or mixed conifer/hardwood stands. Similar to Fuel Model 11, there is a very small percentage of the county (2%) that is characterized by this model and it can generally be associated with areas where timber harvesting has occurred. There is approximately 34.6 live/dead tons of <3-inch fuel per acre to a depth of about 2.3 feet. Also occurring within the 2.3-ft. fuel bed are approximately 4 tons of ¼-inch dead material, and there is typically no live material within the fuel bed. Fires in this model can spread quite rapidly with moderate or high intensities and are capable of generating firebrands. Consistent, even distribution of the fuels within this model continue to sustain fires once they start, until a change or break in the *fuel continuity* is encountered. Fires within this model can produce 8-foot flames.

Wildlife

Wildlife in Humboldt County includes animals, fish, plants, insects, and other invertebrates. The variety of organisms in Humboldt County is extensive and reflects the ecosystem diversity mentioned above. According to the California Department of Fish and Game's California Natural Diversity Database (CNDDB), there are currently at least 158 rare or *endangered species* of flora and fauna found in Humboldt County.[28] (State and federally listed *Threatened and Endangered (T&E) species*, are often referred to as "listed" species.) Rare and endangered species aside, Humboldt's vegetative diversity is home to several hundred species of wildlife. All of the species found within the county, from the marbled murrelet to the coho salmon to the Humboldt milk-vetch, depend on the environment around them to provide the food, water, and shelter they need to survive.

While most biologists acknowledge that fire plays a role in the environment in which these species live, little is known (or perhaps remembered) about the relationship of these species to fire. Their response to fire of varying intensities, frequencies, and seasons is also not well understood; even less understood are the effects of various *hazard reduction treatments* on rare species. All of the species found within the county have had to adapt to fire in some way in order to survive within this fire-evolved landscape. Some organisms learn to flee, others sprout as a result of fire, while others store extensive amounts of seed within the soil in order to re-occupy a site after a fire. These adaptations have helped to establish the flora and fauna found here.

The following table shows a list of federal and state listed species in Humboldt County.

Figure II.1-7. Federal and State Listed Species in Humboldt County[29]

Scientific Name	Common Name	Occurrences
Astragalus agnicidus	Humboldt Milk-Vetch	5
Bensoniella oregona	Bensoniella	5
Brachyramphus marmoratus	Marbled Murrelet	-
Charadrius alexandrinus nivosus	Western Snowy Plover	6

[28] California Department of Fish and Game. (n.d.). *California Natural Diversity Database (CNDDB).* [Interactive map that allows user to view species or natural communities that have been documented by the CNDDB within specific topographic areas]. CNDDB Quick Viewer. Retrieved December 13, 2012, from http://imaps.dfg.ca.gov/viewers/cnddb_quickviewer/app.asp

[29] California Department of Fish and Game, (n.d.) *CNDDB.*.

Scientific Name	Common Name	Occurrences
Empidonax traillii	Willow Flycatcher	1
Erysimum menziesii ssp eurekense	Humboldt Bay Wallflower	6
Eucyclogobius newberryi	Tidewater Goby	6
Falco peregrinus anatum	American Peregrine Falcon	2
Haliaeetus leucocephalus	Bald Eagle	5
Layia carnosa	Beach Layia	10
Lilium occidentale	Western Lily	9
Oncorhynchus clarki clarki	Coast Cutthroat Trout	32
Oncorhynchus kisutch	Coho Salmon - Central California ESU	3
Oncorhynchus mykiss irideus	Summer-Run Steelhead Trout	6
Oncorhynchus mykiss irideus	Northern California Steelhead Trout	-
Oncorhynchus tshawytscha spring-run	Spring-Run Chinook Salmon	1
Rallus longirostris obsoletus	California Clapper Rail	1
Riparia riparia	Bank Swallow	1
Strix occidentalis caurina	Northern Spotted Owl	318
Thlaspi californicum	Kneeland Prairie Pennycress	1

There are other plant and animal species that have not (as of publication) been listed as threatened or endangered at the federal or state level, but which are still rare enough to be listed in the CNDDB. These species, such as the Pacific fisher, Humboldt marten, Pacific lamprey, and green sturgeon, would meet the criteria for listing but have not yet been formally listed or selected as candidates.

In order to reduce potential adverse effects to flora and fauna, and especially to listed species, fuel reduction planners in Humboldt County (such as Registered Professional Foresters) must use the best available information regarding each species within a project area. This includes considering critical habitat attributes that species need in order to survive. Important information such as breeding period, migration patterns, blooming period, and much more, can help planners reduce fire threat, while restoring, enhancing, and/or creating necessary *habitat* within Humboldt County.

II.1.4. Wildfire Hazard

The term “hazard” is mainly used in the fire community in relation to topography and *fuel complex* (the volume, type, condition, arrangement, and location of fuels).[30] “Fire hazard” is a description of the fuels available to burn in a given area and how they would burn. It can be influenced by past disturbances or management activities that alter the hazard for better or worse by changing the overall site moisture. It is also affected by the volume and spatial arrangement of fuels. Fire hazard is distinguished from *fire risk*, which incorporates the probability of wildfire occurrence—or ignitions—with fire hazard.

[30] Husari. S. et al. (2006). Fuel management.

Hazard Assessment and Fire Hazard Severity Mapping

Fire hazard is a way to measure physical fire behavior to predict the damage a fire is likely to cause and how resistant it will be to control. Fire hazard measurement includes the speed at which a wildfire moves, the amount of heat produced by the fire, and most importantly, the burning firebrands that the fire sends ahead of the flaming front. Fire hazard elements include the following, which have been described in more detail in the General Wildfire Environment Descriptions section above:

- **Vegetation**—Whether live or dead, vegetation is "fuel" to a wildfire and it changes over time. The fire hazard severity rating considers the potential vegetation over a 50-year time horizon.
- **Topography**—Fire burns more intensely and spreads more rapidly on steep slopes.
- **Weather**—Fire burns faster and with more intensity when air temperature is high, relative humidity is low, and winds are strong.
- **Crown Fire Potential**—Under extreme conditions, fire burns upwards into tall brush and tree canopies.
- **Ember Production and Movement**—Firebrands are blown ahead of the main fire, which can ignite buildings and spread the fire (spotting).
- **Likelihood of Fire**—The likelihood of an area burning over a 30 – 50 year period.

A site's hazard ranking tells us the expected behavior of fire in severe weather (when wind speed, humidity, and temperature make conditions favorable for a catastrophic fire). *Fire Hazard Severity Zones* (FHSZs) are how the state of California assesses and defines fuel hazards. FHSZs range from Medium to High to Very High.

> "Fire Hazard Severity Zones represent areas of variable size ranging from 20 acres in urbanized areas to at least 200 acres in wildland areas, with relatively homogeneous characteristics regarding expected burn probability and potential fire behavior attributes based on *climax fuel conditions* over a 30-50 year time horizon."[31]

CAL FIRE completed a major effort to reclassify FHSZs in 2007 as a component of implementing the new Wildland-Urban Interface building code *(See Part V. Fire Safety of this CWPP for more information on building codes)*. These reclassifications included *State Responsibility Areas* (SRA) and *Local Responsibility Areas* (LRA).[32]

Humboldt County exhibits extreme diversity in its potential for destructive wildfire, ranging in severity classification from nil to very high, based on the wildfire hazard severity zone map. In SRA lands, the map generally reflects a "high" rating on the western portions of Humboldt, where the fuel potential is high but the climate is damp. The "very high" ratings are generally in the drier, eastern portions of the county, or in very steep terrain, such as found along the Lost Coast. "Moderate" ratings are in valley bottom areas, which are generally urban or agricultural. Those areas not generally prone to fire risk are concentrated in coastal and *estuary* lands. There

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[31] Sapsis, D. (n.d.) *Fire Hazard Severity Zoning (FHSZ) Draft Map Review And Validation* [PowerPoint slideshow]. CAL FIRE. Retrieved December 13, 2012, from http://frap.fire.ca.gov/projects/hazard/Fire_Hazard_Zoning_workshop_1_8.ppt.

[32] *For more information on Fire Hazard Severity Zone mapping, please see:* CAL FIRE. (2007). *Fire Hazard Severity Zone Re-Mapping Project.* Retrieved from *http://frap.fire.ca.gov/projects/hazard/fhz.html* and for information on hazard mapping and associated building codes, please see: CAL FIRE. (2007). *Wildland Hazard/Building Codes.* Retrieved from http://www.fire.ca.gov/fire_prevention/fire_prevention_wildland.php

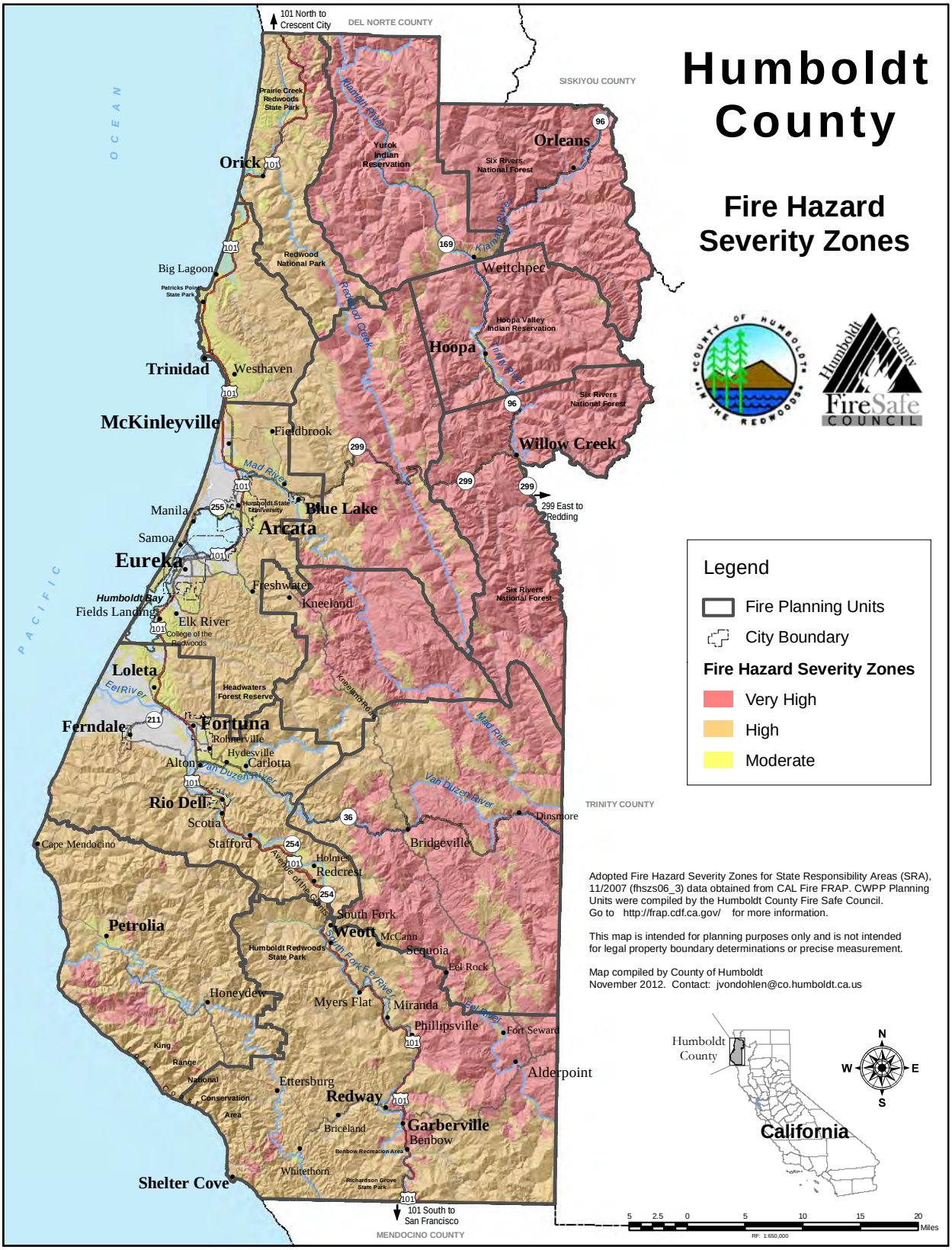
are no "very high" classifications in the LRA in Humboldt County. The table and map below illustrate the distribution of FHSZs in acres by planning unit and geographically throughout the county.

Figure II.1-8. Fire Hazard Severity by Planning Unit

Planning Unit	Fire Hazard Severity (Acres)			
	Very High	High	Moderate	Other*
East Klamath	134,403	78	37	949
Eel	20	160,893	27,845	33,865
Eureka Plain	1,017	97,084	25,127	20,552
Hoopa	107,678	4,771	544	1,152
Kneeland - Maple Creek	79,617	43,617	-	-
Up River	132,086	16,246	1,858	532
Mad-Van Duzen	189,618	109,836	1,207	-
Mattole-Lost Coast	13,826	180,300	6,079	58
Redwood Creek	117,952	72,015	103	-
Redwood Park	15,236	72,208	12,138	438
Southern Humboldt	77,573	292,392	5,442	201
Trinidad	6	45,999	21,344	30
Trinity	164,130	3,926	118	188
Total	**1,033,162**	**1,099,364**	**101,841**	**58,265**

**Other = Non-Wildland/Non Urban or Urban Unzoned*

Figure II.1-9. Fire Hazard Severity Zones Map



II.1.5. Wildfire Risk and Fire History

The fire history of an area is a description of the time, space, and cause of fires in the area. In fire jargon, *"fire risk"* is often associated with fire history, as this term describes the events that cause a fire to start (i.e. ignitions).

Fire history is important because it helps to illustrate the potential for future fires. Large fires often repeat themselves; hence it is useful to understand burning patterns over time. An area's fire history also portrays ignition patterns that can target effective prevention programs. For example, if there is a history of frequent fires along a well-traveled route, roadside vegetation management may be in order. Additionally, fire history discerned through fire scars on tree rings may indicate the way fires have changed over time, both in frequency and intensity. This may point to appropriate goals for future fuel conditions, and their potential management or restoration to historic conditions.

Fire has been a significant factor in Humboldt County's history. Evidence of this can be seen in the fire scars on ancient redwoods, some dating back more than a thousand years. Despite the generally damp climate prevailing in these forests, studies have suggested an historical *fire return interval* of 50 to 100 years in the northern part of the county, and 12 to 50 years in the south.[33] The County's fire history map below includes the occurrence of several large fires along the coast from as early as 1908. Surprisingly, several of the more destructive historical fires have occurred on the coast around the Trinidad area, including the 7,432-acre Luffenholz Fire of 1908, the 17,527-acre A-Line Fire of 1936, and a 15,000 –acre unnamed fire near Patrick's Point in 1945.

The wildfire season in Humboldt County generally begins in June and typically ends in mid-October; however, wildfires have occurred in every month of the year. Drought, light snow pack, and local weather conditions can expand or shorten the length of the fire season. As described above, changing climatic conditions are beginning to change the local fire season. The early and late shoulders of the fire season are usually associated with human-caused fires. The peak months of July, August, and September are usually related to thunderstorms and lightning strikes.

Typically, western Humboldt County's wildfire season is shorter than the eastern half for a number of reasons: 1. The western half of the county receives more rainfall; 2. The West has spring seasons that are wetter and cooler than the East; 3. Temperatures in the eastern portion of the county are much higher in the summer months; and 4. Much of the precipitation received in the east falls as snow during the winter.

Fire Caused by Natural Lightning

Lightning fire ignitions are generally much less prevalent in Humboldt County than in much of the rest of the western United States. However, they do occur occasionally (including dozens of "Lightning Complex" Fires from single storms in both 2003 and 2008). The northeastern area has the highest prevalence of lightning in the county. Lightning fire ignitions are particularly problematic from a suppression standpoint, due to the likelihood of multiple ignitions within a few hours, and the increased likelihood of those starts (ignitions) occurring in more remote areas.

In *Fire in California's Ecosystems*, Stuart and Stephens write about the history and ecology of fire in the North Coast Bioregion:

> "Lightning fires are more numerous at higher elevations in the North Coast Ranges than in the coastal regions, but not as numerous as in the Klamath, Shasta, or Trinity National Forests (Show and Kotok 1923, Keeley 1981). Van

[33] CAL FIRE: Humboldt – Del Norte Unit (HUU). (2011). *Draft 2011 Unit Strategic Fire Plan Humboldt – Del Norte Unit.* (p. 11). Retrieved from http://www.co.humboldt.ca.us/natural-resources/fire_safe_council/pdf_files/2011%20huu%20strategic%20fire%20plan.pdf .

> Wagtendonk and Cayan (2007) found that lightning strike density increased with distance from the Pacific Ocean … and increasing elevation for the period between 1985 and 2000."[34]

Native American Fire History[35]

It is generally accepted that the original inhabitants of North Coastal California actively stewarded and extensively managed their lands with practices that included setting fires. These frequent, low-intensity burns helped to keep pest populations down, improved the health of the acorn crop and other desirable forest products, and improved hunting grounds. It is assumed that Native American burning occurred here for many thousands of years prior to European settlement. The first documented non-Native American confirmation of historical burning came from French explorer Jean Francois Galoup de la Perouse in 1786. From his ship sailing south along the Humboldt coast, he reported:

> "At half-past seven we suddenly discovered, to the south-south-east, a considerable fire on Cape Mendocino; this fire covered the greater part of the hill, from the sea-shore to the summit, and it appeared to extend to the other side...."[36]

Perouse attributed the fire to a volcano. This was later refuted by another Frenchman, Camille de Roquefeuil, under similar circumstances in 1818:

> "Accurate inquiries at Saint Francisco convinced me that this fire, which at a distance might have been taken for a volcano, must be ascribed to the Indians, as well as other less considerable, and more distant ones, which we saw that and the preceding nights. The natives at this season (September) set fire to the grass...."[37]

The acreage burned by California's earliest humans was significant. Fire scientists Robert Martin and David Sapsis estimated that 5.6 to 13 million acres of California burned annually under both lightning and indigenous people's *fire regime*s.[38] However, fire scientist Scott Stephens, Sapsis, and others have now estimated lower numbers. They estimate that 4,447,896 acres burned annually in California prior to 1800, excluding the southwestern deserts.[39] This estimate of prehistoric annual area burned in California is 88% of the total annual "extreme" wildfire area burned in the entire United States within a single decade (1994–2004).[40] From 1950 to 1999, the average annual area burned by wildfire in all vegetation types in California was

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[34] Stuart, J.D. & Stephens, S.L. (2006). North Coast Bioregion. In: Sugihara, N.G., van Wagtendonk, J., Shaffer, K.E., Fites-Kaufman, J., & Thode, A.E. (Eds.). *Fire in California's Ecosystems.* (p.153.) Berkeley: University of California Press.

[35] Much of the text for this section came from previous fire planning work of ForEverGreen Forestry, including: Mattole Restoration Council. (2004, August 9). *Final Upper Mattole Fire Plan.* Retrieved from http://classic.mattole.org/html/publications_publication_13.html and: County of Lake, California. (2010). *Wildfire Protection Plan.* Retrieved from www.co.lake.ca.us/Government/Boards/AdvisoryBoard/lcfsc/LCCWPP.htm.

[36] Roscoe, J. (1985). *An Ethnohistory of the Mattole, Humboldt County, California.* (p. 15.) Part of the Archaeology Field Survey Reports Contributed by BLM, Arcata Field Office. DOI:10.6067/XCV8T72FX0.

[37] Roscoe, J. (1985). p. 16.

[38] Anderson, M.K. (2005*). Tending the wild: Native American knowledge and the management of California's natural resources.* Berkeley: University of California Press.

[39] Stephens, S.L., Martin, R.E., & Clinton, N.E. (2007). Prehistoric Fire Area and Emissions from California's Forests, Woodlands, Shrublands, and Grasslands. *Forest Ecology and Management, 251,* 205–216.

[40] Stephens, S.L., et al. (2007).

approximately 25,2047 acres per year, only approximately 5.6% of what traditionally burned in a similar timeframe.[41] Regardless of errors in either estimation, prior to modern fire suppression, very large amounts of land burned in California. Skies were likely smoky much of the summer and fall in California, including Humboldt County, during this period.[42]

As the home of over a dozen Native American Tribes speaking languages from three different linguistic affiliations, Humboldt County has a rich native cultural history. Native populations made use of fire and natural resources in many ways. For example, active stewardship of the prairies and forests was practiced through the use of fire. These burns improved wildlife habitat and enhanced the health and growth of the tanoak and plants used for basket making, such as bear grass.

European Settlement Fire History

European settlement in the area began with Spanish and Russian explorers in the late 1700s and early 1800s. The discovery of gold in the Klamath and Trinity Mountains brought miners, traders, and explorers, and forever changed the region. The gold rush brought settlement but mining was quickly replaced by timber as the dominant industry. Logging—primarily of the largest, oldest trees—became common, with subsequent changes in forest structure and fuel volumes. By 1854, there were nine lumber mills around the county involved in exporting lumber worldwide. Dairy and cattle operations also became essential to the county's economy. Many forms of impactive land management during this era (such as logging, grazing, development and, most notably, fire suppression) have significantly influenced the fire history of Humboldt County.

The arrival of European-descent settlers brought radical changes and upheavals to the indigenous populations, as well as to the "natural" landscape here. Because of the conflicts between white settlement and traditional subsistence use, violence erupted in many areas, such as in the Mattole Valley in the southwestern corner of the county. In order to resolve the resulting crisis, Mattole settlers decreed a resolution that was published in the September 18, 1858, *Humboldt Times.*[43] The resolution included "that the Indians must not set fire to the grass on the hills...."[44] Therefore, burning in the Mattole Valley and other areas of the county was virtually stopped for a short time, until the late 1800s/early 1900s, when ranchers then reinstated it on grasslands to promote better range conditions. The following quote summarizes fire management practices throughout Humboldt County at that time.

> "During the settlement period (1875-1897) European settlers used fire for maintenance and enlarging the pasturelands and as a land clearing method. Major land activities during the post settlement period (1898-1940) were livestock grazing, farming, debarking of the tanoak for tannin production and logging of Douglas-fir and coast redwood. Logging was clearly a dominant activity during this time period.… In this time of unrefined mechanized equipment, the logging operations were simplified as much as possible. Logged areas were burned to assist with the removal of the logs and reduce the logging debris left behind. These fires were left to burn with no real control efforts. The same can be said

[41] Stephens, S.L., et al. (2007).

[42] Stephens, S.L., et al. (2007).

[43] CalIndianHistory.org. (2010). *California Newspaper Articles: September 18, 1958 Mattole.* Retrieved from http://calindianhistory.org/DocsNews/1858/09_18_1858Mattole.pdf

[44] Roscoe, J. (1985). p. 33.

> for the area ranchers who commonly set fire to their land in order to maintain the grazing.[45]

The pattern of historic Native and early settlement burning, as well as random high-intensity wildfires, helps to explain the presence of dense old-growth forests in the drainages and open meadows along the ridges of many rural areas of the county, which can be seen in the earliest available aerial photographs from 1941. Regarding the effects on the landscape and the change in historic fire patterns in the Mattole watershed (applicable to much of southern and eastern Humboldt County today),

> "An examination of these same forested areas today reveals that many of these clearings have become overgrown with brush and timber since aboriginal burning practices were curtailed by the Whites.[46]

CAL FIRE summarizes the fire history during this period as follows:

> "Reviews of area newspapers and various studies at Humboldt State University indicate that there was indeed a significant fire history from the late 1800's through early 1950's. Notable are 24 "fire seasons" between 1880 and 1952. During this time period the fire interval was 3.3 years. Some of these fires included entire towns being burned, such as the 1908 fire that destroyed the community of Luffenholz. People were left homeless, local mills and railroad tracks all perished from these large severe fires.[47]

As a result of large destructive fires in the West and Midwest in the early part of the 1900s, the perception of fire as a beneficial tool, as seen by Native Americans, was overlooked and viewed instead as a major threat to lives, property, and natural resources. The outcome of this viewpoint was the "10 a.m. policy" adopted by the United States Forest Service (USFS) in 1935. This policy sought to aggressively suppress fires and have them extinguished by 10 a.m. the morning following a fire being discovered.

> "Civilian Conservation Corps began work in the Humboldt-Del Norte area in the mid 1930s, developing an improved local firefighting infrastructure. After 1945, the severity and number of fires began to decline significantly…. World War II had taken the work force overseas; with the return of the soldiers came an active fire suppression program."[48]

Emanuel Fritz (Professor Emeritus of Forestry at University of California Berkeley and Founding Director of the Regional Parks Association) noted in 1951, "In the early days of forestry we were altogether too dogmatic about fire and never inquired into the influence of fire on shaping the kind of forests we inherited."[49]

Recent Fire History

Intensive fire suppression over the last seventy years or so, combined with increased development, a resulting lack of homeowner defensible space, and logging of the largest trees, has led to an increase in the amount of flammable materials now accumulated throughout Humboldt County. Today, it is widely accepted that fires burn longer and hotter than those prior to European settlement. "More area is burning at high intensity, and this is related, in part, to

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[45] CALFIRE: HUU. (2011). pp. 5-6.

[46] Roscoe, J. (1985). p. 17.

[47] CAL FIRE: HUU. (2011). p. 6.

[48] CAL FIRE: HUU. (2011). p. 6.

[49] Stuart, J.D. & Stephens, S.L. (2006). North Coast Bioregion. (p.147.)

higher quantities and more homogeneous fuels caused by accumulation during the fire-suppression period."[50] Wildfire now *escapes* less than two percent of the time—but those few escaped fires find a choked, fuel-heavy landscape, and result in the vast majority of damage.

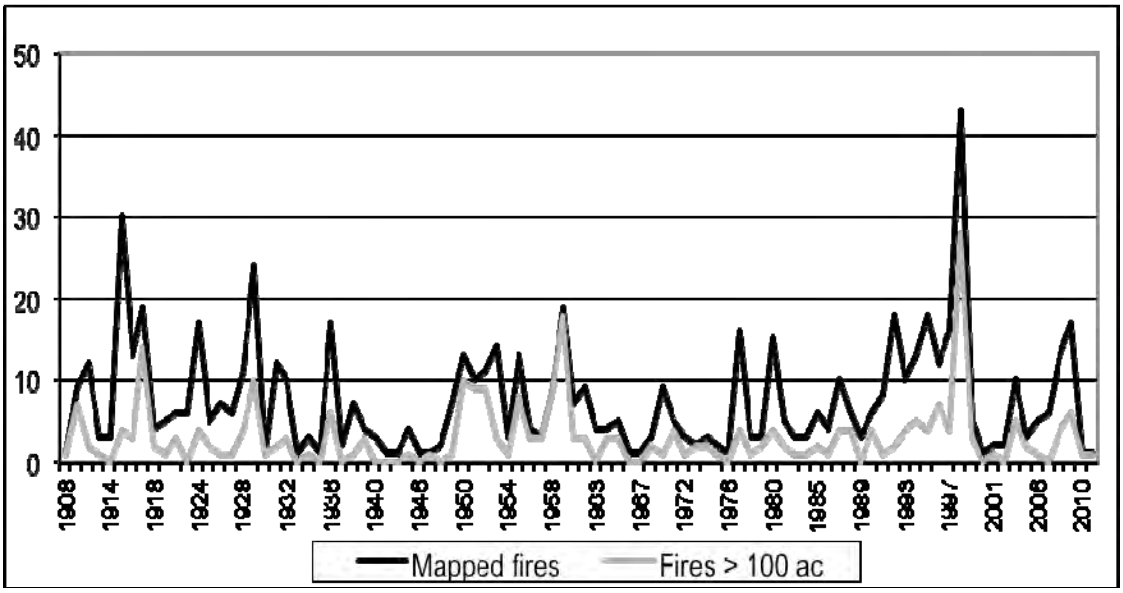
Prescribed fire (controlled burning) has been used in recent decades by logging companies, Native Americans, federal and state agencies, local ranchers, and to an increasing extent, homeowners, for fuel reduction and other landscape benefits. Due to concerted and participatory fire safety efforts led by local fire safe councils (FSC) *(see Community Preparedness Chapter in this CWPP for more information on local FSC activities),* public acceptance of prescribed fire has increased in Humboldt communities. In the town of Orleans for example, the Orleans/Somes Bar FSC has maintained over 400 acres of *shaded fuelbreaks* using prescribed fire in the last decade, with funding from the USFS, CAL FIRE, and other sources. Prescribed fire projects in the county range from small-scale, landowner-conducted individual burns through CAL FIRE's *LE-5* and *LE-7* permit process, to large burns conducted by CAL FIRE under the Vegetation Management Program (VMP). Timberland managers use fire throughout the county to burn piles or *broadcast burn* larger areas.

State and federal agencies—including CAL FIRE, State Parks, Redwood National Park, the Bureau of Land Management (BLM), and the USFS—all use prescribed fire where appropriate and when possible to achieve a variety of land management objectives. CAL FIRE is an active cooperator with other public agencies such as State Parks, providing equipment, crews, and other resources to assist with their burns. They also conduct "training burns," which can produce a fuel-reduction benefit. There are several prescribed fire programs conducted on federal public lands. Redwood National Park has an active program that often uses CAL FIRE resources. BLM burns are usually coordinated with CAL FIRE, as most BLM areas are within the State's Direct Protection Area by agreement.

Current fire history is maintained by CAL FIRE'S Fire and Resource Assessment Program (FRAP). Since 1908, CAL FIRE has been mapping all fires of 10 acres or larger in size. According to current FRAP data, 737 wildfires burned in Humboldt County between 1908 and 2011. The decade with the most fires was the 1950s, with 99 fires (although 2000-2009 had 58 fires), while the 1940s saw the lowest frequency with only 21 fires. As shown in Figure 11.1.10 below, there is a distinction between all fires, and those larger fires of 100 acres of more. Notable in this graphic is that the Lighting Complex fires of 1997 were the most in any one year in recorded history. This is important to keep in mind in terms of potential future lighting ignitions due to climate change

[50] Skinner, C.N., Taylor, A.H., & Agee, J.K. (2006). Klamath Mountain Bioregion. In: Sugihara, N.G., van Wagtendonk, J., Shaffer, K.E., Fites-Kaufman, J., & Thode, A.E. (Eds.). *Fire in California's Ecosystems.* (p. 179.) Berkeley: University of California Press.

Figure II.1.10. Humboldt County Number of Fires per Year, 1908-2011[51]



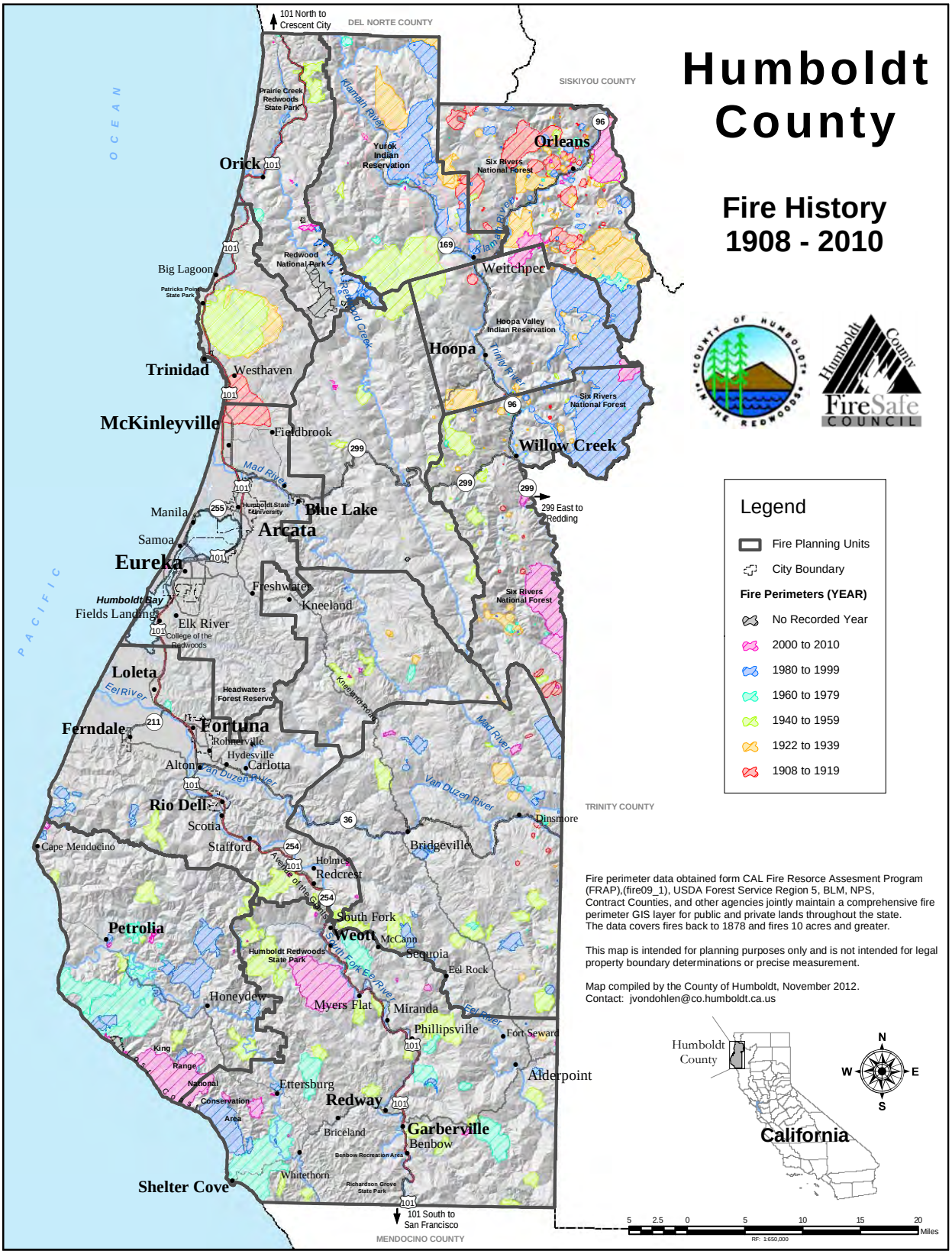
Recent and historic wildfire events in and around Humboldt County have shown the potential for extremely hazardous *burning conditions* resulting in threats to life, health, and property. Recent noteworthy wildfires in Humboldt County are (acreages are for the entire fire, which may have extended beyond Humboldt):

- Backbone Fire (2009), Six Rivers National Forest (NF) and Shasta-Trinity NF — 6,324 acres
- Canoe Fire (2003), Humboldt Redwoods State Park and environs — 10,000 acres
- Cedar Fire (2008), Shasta-Trinity NF (part of the Iron Complex) — 25,398 acres
- Friday Fire (2003), Willow Creek area — 389 acres
- Hell's Half Complex Fire (2008), Six Rivers and Shasta-Trinity NFs — 15,146 acres
- Honeydew Fire (2003), Lost Coast area —10,831 acres
- Ironside Fire (2008), Shasta-Trinity NF (part of the Iron Complex) — 12,720 acres
- Lightning Complex Fire (2008), multiple small fires, various locations including area northeast of Shelter Cove — 1,325 acres
- Megram Fire (1999), Six Rivers and Shasta-Trinity NFs (part of the Big Bar Complex Fire)— 124,898 acres
- Onion Fire (1999), Shasta Trinity National Forest — 15,949 acres
- Paradise Ridge Fire (2008), King Range/Paradise Ridge area — 1,076 acres
- Somes Fire (2006)— 15,710 acres (6,494 of which were in Humboldt County)
- Ziegler Fire (2008), Shasta-Trinity NF (part of the Iron Complex) — 2,349 acres

The Humboldt County Fire History Map (Figure II.1.11 below) shows these fires and other fires over 10-acres in size, between 1908 and 2011. As described throughout this chapter, the highest occurrence of wildfire in the County occurs in the northeast and southwest portions of the county, although several significant fires have occurred along the northern coastal areas of Humboldt County

[51] CAL FIRE. (2007). Fire Resources Assessment Program (FRAP).

Figure II.1-11. Fire History Map 1908-2010

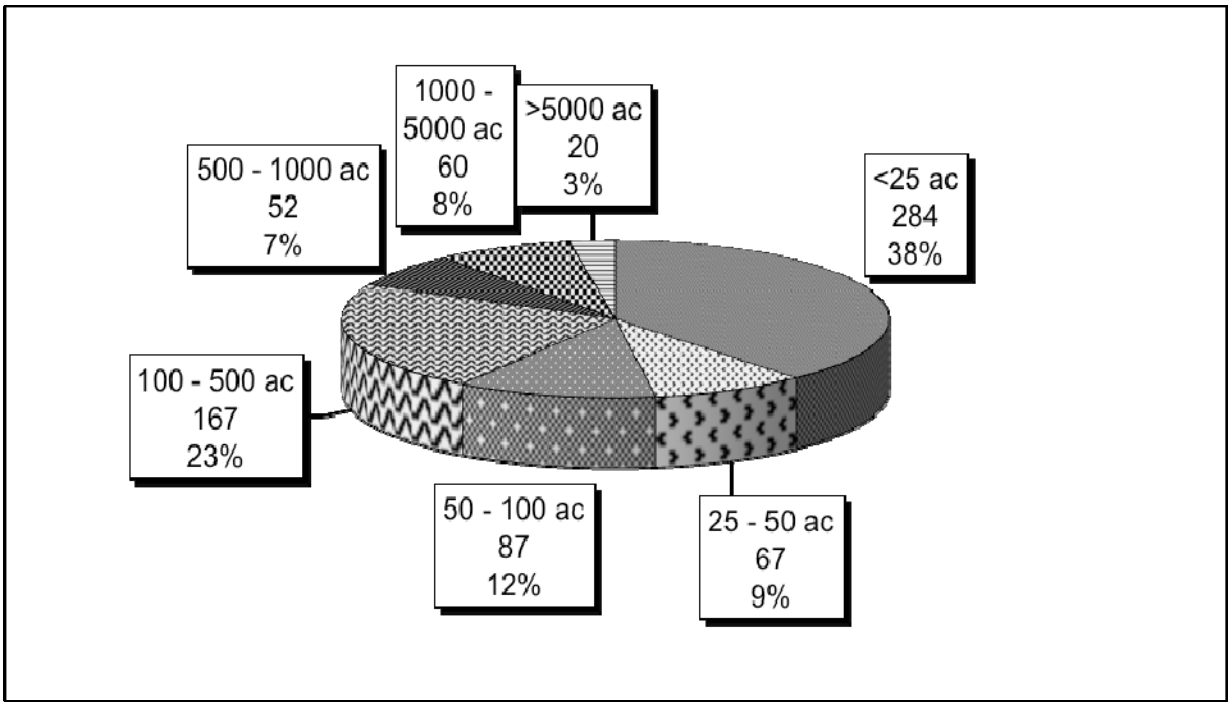


The following chart shows the average number of fires by size, between 1908 and 2011. As expected, most fires (284, or 38%) are small, in this case, less than 25 acres. Fires under 10 acres are not included in this data, so the small fires documented are between 10-25 acres; one can assume that fires under 10 acres have a much higher frequency. Beyond these small fires, the largest number of fires (167 fires or 23% of all fires in Humboldt County between 1908 and 2011), were between 100 to 500 acres. Although the list above shows the largest, and most memorable recent fires, the data indicates that there have been only 20 fires over 5000 acres since 1908, or only 3% of wildfires in Humboldt County in recorded history. Of those 20 large fires however, 7 have occurred since 1999.

Much credit for keeping fires small and manageable can be given to the presence of high-capacity fire services, situated for quick response throughout the county (*see Chapter II.1.3. Wildfire Protection for more information*). On the other hand, the history of effective fire suppression in Humboldt County is one of the factors contributing to a buildup of hazardous wildfire fuels in the wildlands as well as WUI areas. Add the projected impacts of climate change and SOD to this equation and this area could be facing even larger and more destructive wildfires in the future (destructive of both natural and community resources).

Considering the probability of significant increased wildfire threats, it is important that Humboldt County residents are increasingly vigilant regarding reducing wildfire risks and hazards in their homes and communities to improve their fire safety (*see Part V. Fire-Safe Communities for an in depth discussion on this topic*). Taking the steps recommended in this CWPP will decrease the vulnerability of communities to damage from wildfire. Fire hardened homes and communities will provide an opportunity for the more aggressive use of prescribed fire as a fuels reduction tool during the early and late fire season when conditions are good for low intensity burning. It will also be less risky to let low intensity wildfires take their natural course without jeopardizing community and natural resources. Maintaining high capacity fire services will continue to be important to manage all wildfires threatening valuable resources. If we choose to prioritize minimizing wildfire impacts in Humboldt County, we can likely make a significant difference in its effects here.

Figure II.1.12. Humboldt County, Total Number of Fires by Acreage, 1908-2011[52]



Ignition Sources

People start most wildfires, but those are not necessarily the ones that get big, at least in Humboldt County. Major human-caused fires include arson, recreational fires that get out of control, smokers' carelessness, debris burning, and children playing with fire. Figure II.1-13. Potential Incendiary Wildfire Ignition Sources, shows areas where fires are expected to start in Humboldt County: around residential areas, commercial or industrial lands, power lines, and railroad lines. This map shows that many of these potential *ignition sources* are located in the more populated, western areas of the county. However, this map does not show lightning occurrence areas, which is significant in the higher elevations of the county.

Figure II.1-14. Wildfire Starts Map shows that most actual wildfire ignitions (whether human-caused or lighting-initiated) have been heaviest in the less populated, eastern areas of the county. Of the fires over ten acres in size documented from 1908-2011 with known ignition sources, 44% were started by people and 41% were started by lightning.[53] However, human activities often influence the severity and number of fires caused by lightning strikes. Therefore, human activities either directly cause or significantly influence most wildfires in Humboldt County.

[52] CAL FIRE. (2007). Fire Resources Assessment Program (FRAP).
[53] CAL FIRE. (2007). Fire Resources Assessment Program (FRAP).

Figure II.1-13. Potential Incendiary Wildfire Ignition Sources

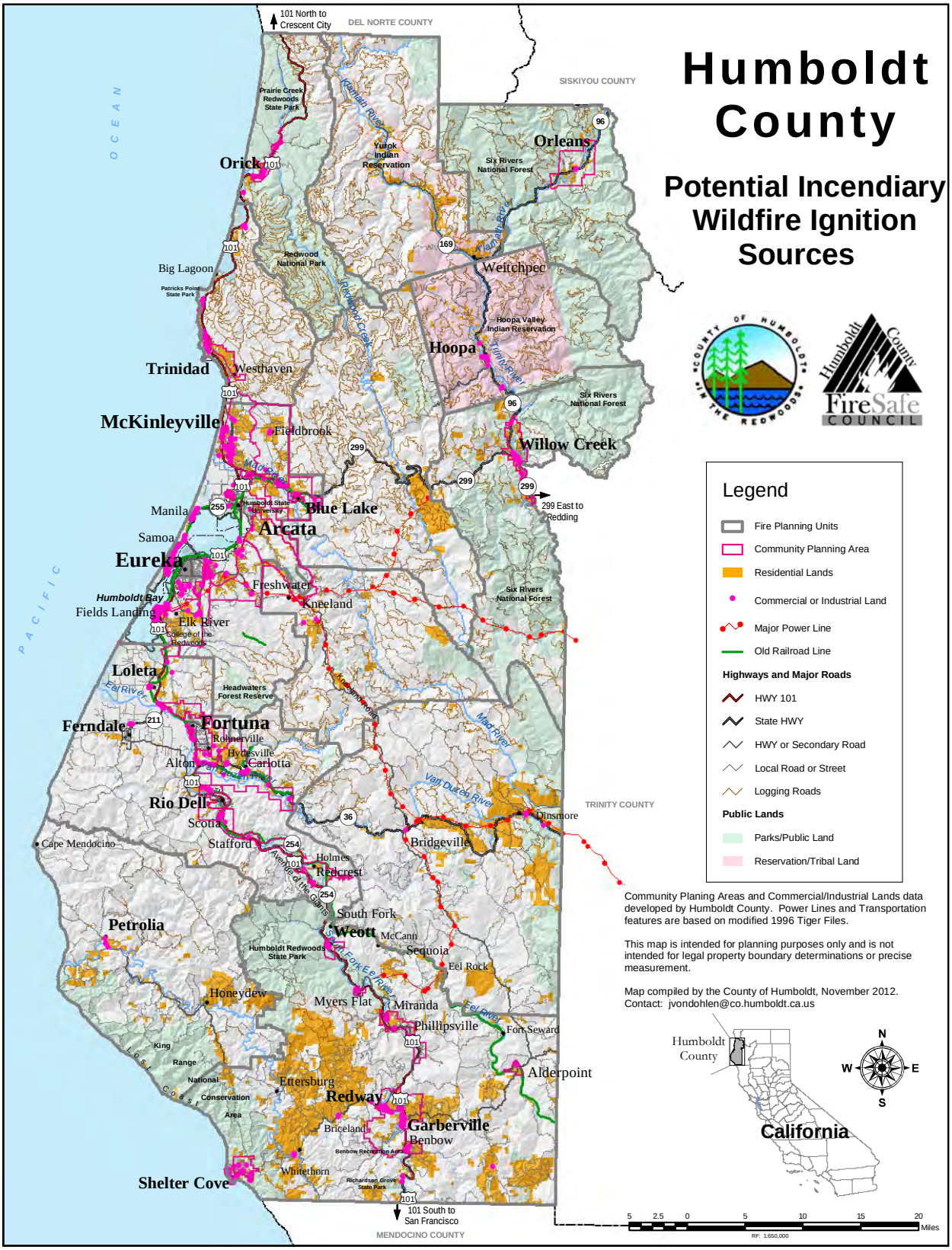
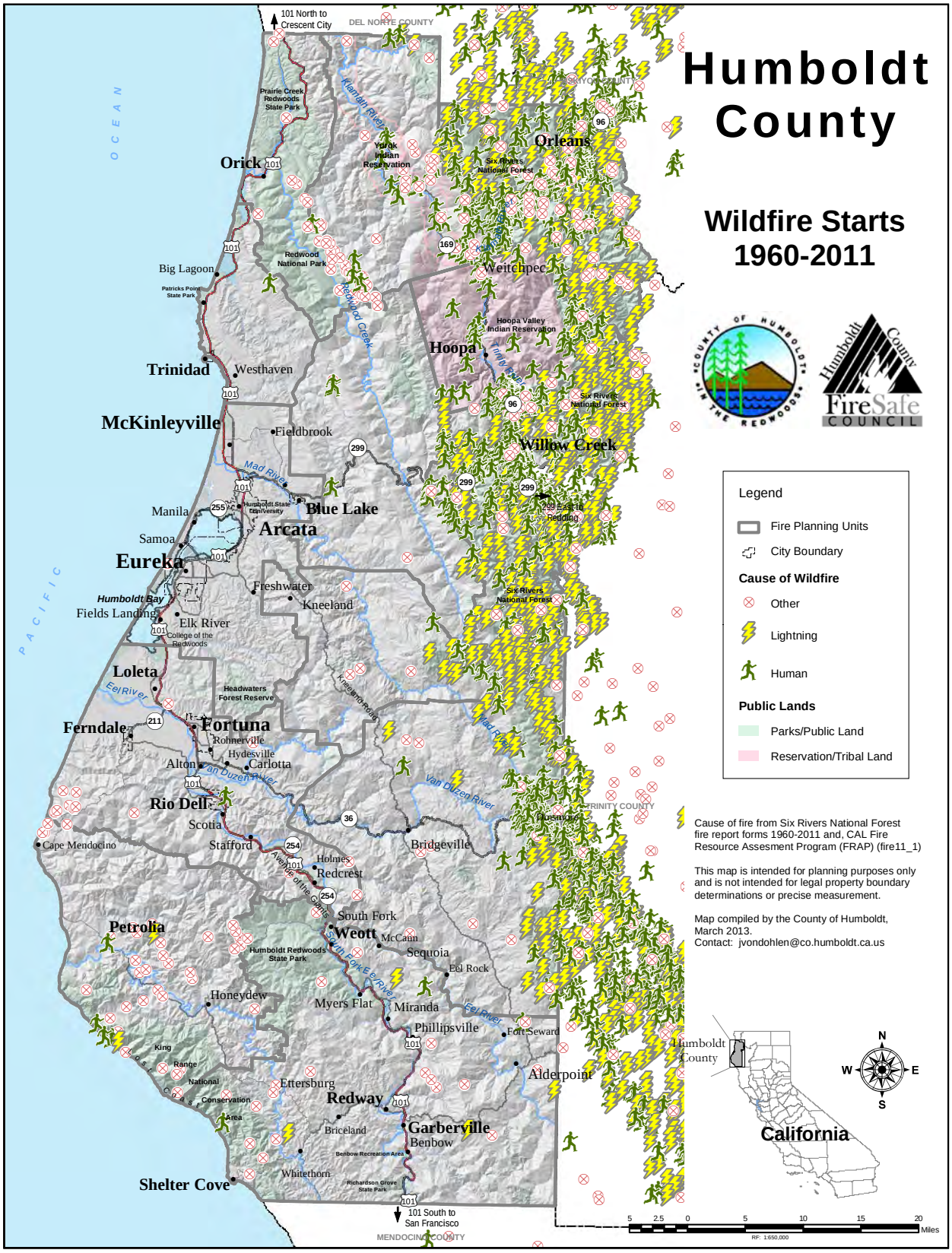


Figure II.1-14. Wildfire Starts Map



II.1.6. Fire Regime

Fire regime is a description of fire's historic natural occurrence, variability, and influence on vegetation dynamics in the landscape. Fire regimes can provide information for fire planning, as they describe the frequency of fire and the effects a fire is expected to have on a particular area's vegetation. Generally based on fire history reconstructions, fire regime descriptions include the season, frequency, severity, size, and spatial distribution of fires. There is quite a wide variability of "natural" intervals, severities, and seasons, but some generalities have been made. Over the years, foresters and plant ecologists have come to use a small number of standardized fire regime classes to make general comparisons about the fire ecology of different ecosystems and geographic regions. The regimes listed below show fire regime classes commonly used by the USFS and other land management agencies.[54]

The five historical fire regimes are classified based on the average number of years between fires (fire frequency) combined with the fire severity (amount of consumption of the dominant overstory vegetation). The five regimes are:

I: 0 to 35-year frequency and low (surface fires most common) to mixed severity (less than 75% of the dominant overstory vegetation replaced);

II: 0 to 35-year frequency and high (stand replacement) severity (greater than 75% of the dominant overstory vegetation replaced);

III: 35- to 100+-year frequency and mixed severity;

IV: 35- to 100+-year frequency and high severity;

V: 200+-year frequency and high severity.

The above classification system was used to make one of the first nationwide, coarse-scale maps of fire regimes. CAL FIRE used it to produce the somewhat more detailed (but still very coarse scale) statewide fire regime maps.[55] The LANDFIRE (also known as Landscape Fire Resource and Management Planning) program has since revised the fire regime class definitions and conducted a national analysis for the National Interagency Fire Coordinating Group. They have produced an elaborate methodology for conducting regional scale analyses that could be undertaken to produce more local-scale map products for Humboldt County.[56]

The CAL FIRE fire regime data for Humboldt County is shown in Figure II.I-15 below. Although the fire regimes in Humboldt have been altered due to fire suppression and other land management activities, there are two pre-settlement fire regimes still found here today. According to information collected and analyzed by CAL FIRE, Humboldt County primarily has a natural

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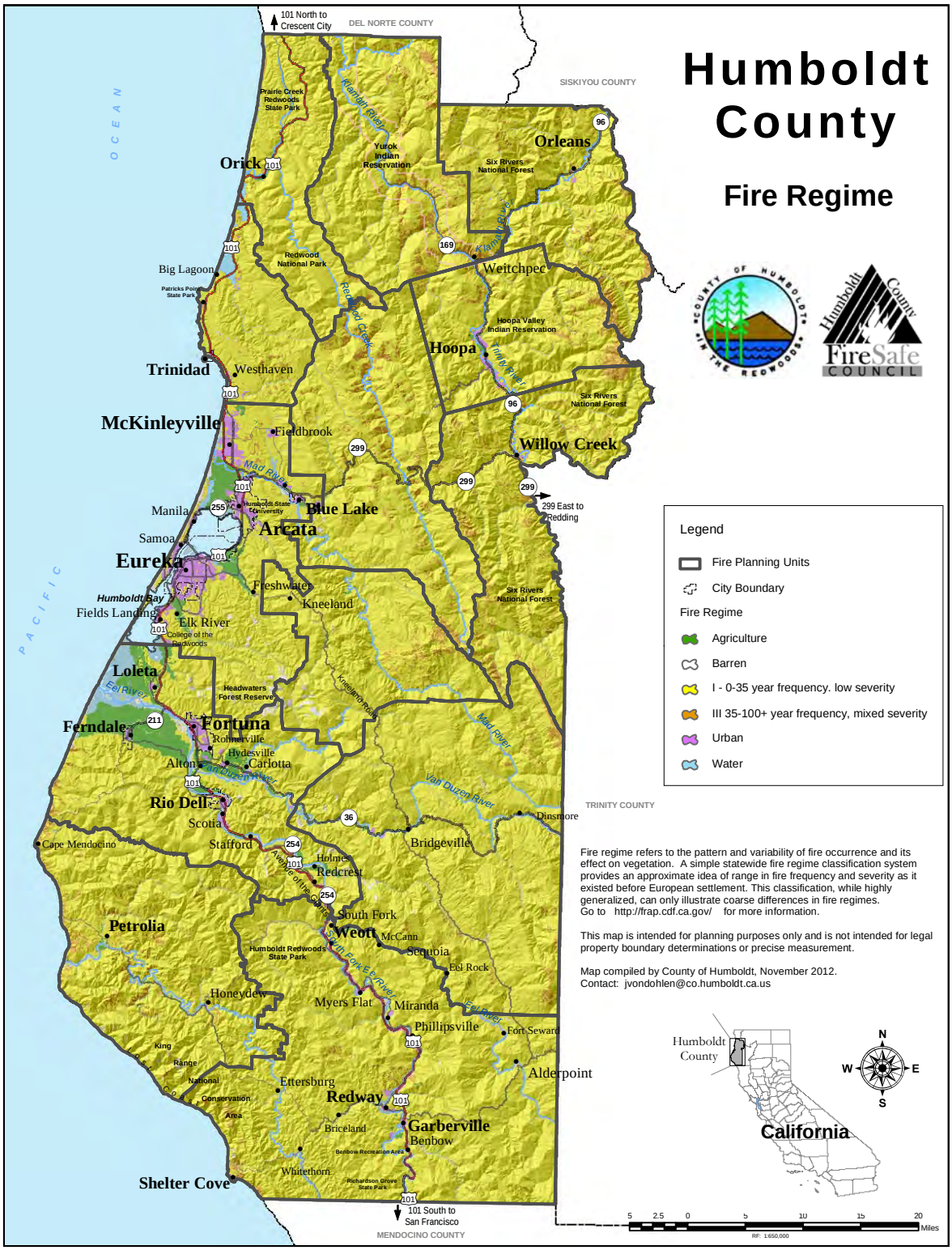
[54] Schmidt, K.M., Menakis, J.P., Hardy, C.C., Hann, W.J., & Bunnell, D.L. (2002). Development of coarse-scale spatial data for wildland fire and fuel management. *General Technical Report RMRS-GTR-87.* Fort Collins, CO.

[55] CAL FIRE. (2003*). Fire Regime and Condition Class.* Geographic Information System data file [ArcInfo grid file]. Cafrcc_03v2. Metadata. Retrieved from http://frap.cdf.ca.gov/data/frapgisdata/download.asp?rec=cafrcc.

[56] Barrett, S., Havlina, D., Jones, J., Hann, W., Frame, C., Hamilton, D., Schon, K., Demeo, T., Hutter, L., & Menakis, J. (2010). *Interagency Fire Regime Condition Class Guidebook.* Version 3.0 [Homepage of the Interagency Fire Regime Condition Class website, USDA Forest Service, US Department of the Interior, and The Nature Conservancy]. [Online], Retrieved from: http://www.frames.gov/partner-sites/frcc/frcc-guidebook-and-forms/

fire return interval between 0 – 35 years of low severity fire (Fire Regime I), as well as scattered areas of Fire Regime III (generally on ridgetops, and more often in the eastern parts of the county), with a 35 – 100+ year frequency of mixed severity fire.

Figure II.1-15. Fire Regime Map



II.1.7. Condition Class

The difference in fire regime between pre- and post-European settlement is described by the *condition class,* or the degree of departure from the historical natural fire regime. Mapping of the fire regime condition class has been done nationwide and is widely used. Usually where the condition class indicates that fire has been absent for an unnaturally long time, the hazard and potential damages are high to both the environment and human developments in the area.

Fire Regime Condition Class (FRCC) [57] is based on a relative measure describing the degree of departure from the historical natural fire regime. The departure from natural fire regimes results in changes to one or more of the following ecological components: vegetation characteristics (species composition, structural stages, stand age, canopy closure, and mosaic pattern); fuel composition; fire frequency, severity, and pattern; and other associated disturbances (e.g. insect and disease mortality, grazing, and drought). There are no wildland vegetation and fuel conditions or wildfire situations that do not fit within one of the three classes.

The three classes are based on low (FRCC 1), moderate (FRCC 2), and high (FRCC 3) departure from the central tendency of the natural (historical) regime. "Low departure is considered to be within the natural (historical) range of variability, while moderate and high departures are outside."[58] Areas considered at a high or moderate departure from the natural regime are experiencing dramatic increases in fire behavior, intensity, severity, and fire size.[59]

The greater the departure from the natural fire regime, the greater the variations to ecological components and the higher the risk of losing *key ecosystem components.* For example, FRCC 3 classification means that fire regimes have been greatly altered from their natural range (e.g., from 3-10 years between fires, prior to European settlement, to 50 – 70 years since) and, likewise, vegetation characteristics have been dramatically altered from their natural range. For example, an area may have experienced a fire regime of small, frequent, low-intensity fires prior to European settlement. However, because fire suppression has been successful, only one fire has burned in the area in the past 100 years. The fuels have become voluminous and hence fire behavior is predicted to be intense, with the potential to kill trees that have survived other fires over the centuries. The fuels have also become more uniform, creating conditions that facilitate fire spread and result in larger fires. Therefore, the risk of losing key ecosystem components is high.

Fuel management projects can restore the vegetation type and structure through prescribed fire and/or other types of management techniques in a spatial distribution that can mimic the effect of natural fire regimes. Thus, fuel management can move a condition class to one more closely resembling pre-European settlement, regardless of recent fire history.

Condition class does not relate directly to fire hazard but is designed to better predict the effects of a fire, specifically the fire-related risks to ecosystems. All three condition classes (1, 2, and 3) exist in Humboldt County, as shown on the following map. Condition class is generally within or near fires' historical range for the western and lower elevation/riparian areas of the county. As elevation increases, condition class changes from moderately altered to severely altered from historical range, as shown on the following map.

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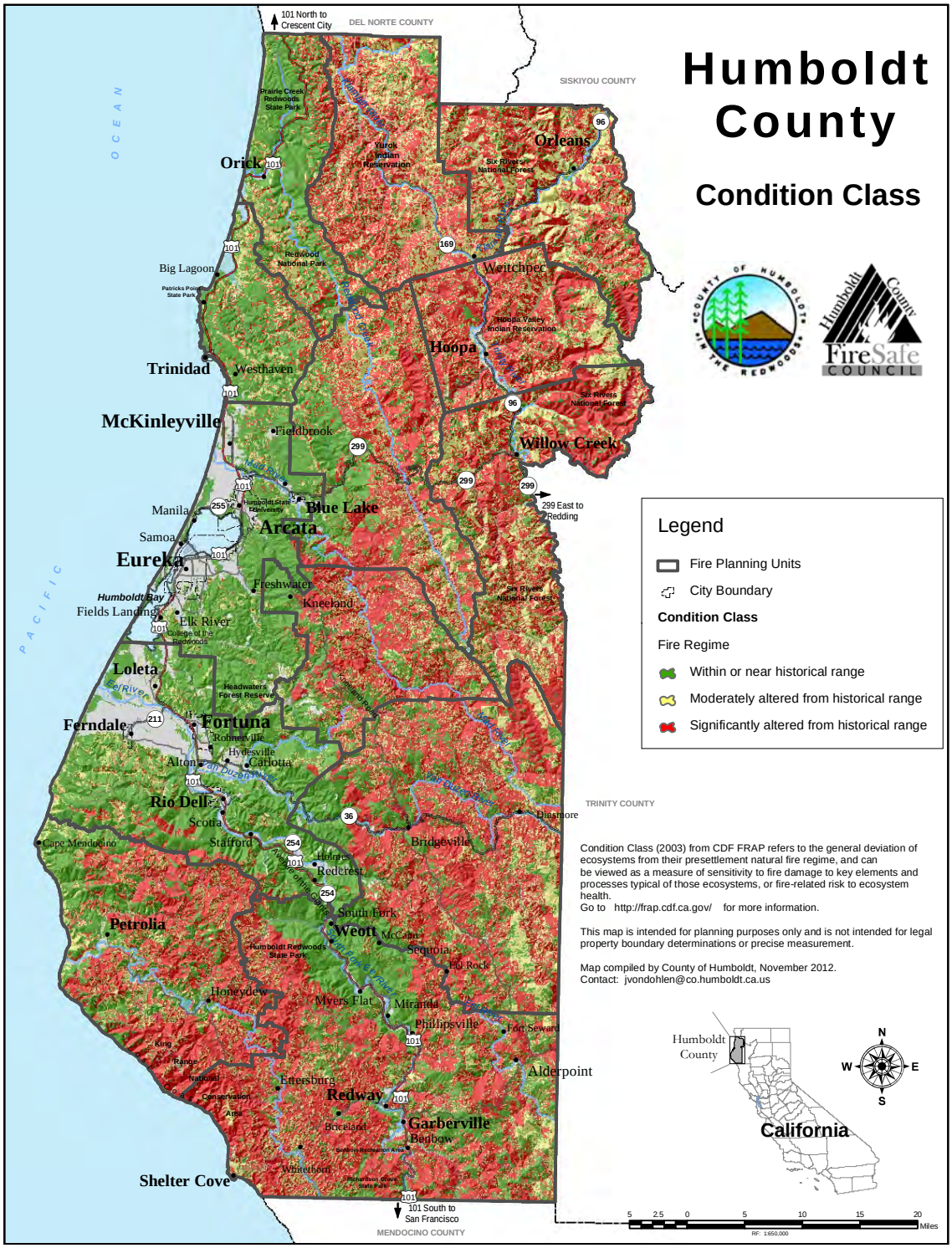
[57] Barrett, S. et al. (2010*). Interagency Fire Regime Condition Class (FRCC) Guidebook.*

[58] National Wildfire Coordinating Group,. (2003, June). *Fire Regime Condition Class Definition.* Retrieved from http://www.nwcg.gov/teams/wfewt/archive/message/FrccDefinitions.pdf

[59] Barrett, S. et al. (2010*). Interagency Fire Regime Condition Class (FRCC) Guidebook.* .

The influence of fire significantly shaped the ecosystems found throughout Humboldt County today. Understanding the local wildfire environment and people's place in it—through fire history, fire behavior, and fire science—will help Humboldt communities to live safely within this fire-evolved landscape.

Figure II.1-16. Condition Class Map



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II.2.1. Community and Economic Assets II.2-1
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Communities at Risk II.2-2
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II.2. Values and Assets at Risk

Assets (values) at risk are those things that are important to quality of life that can be threatened with destruction or loss from wildfire. These include a variety of things, such as homes, businesses, infrastructure, cultural sites, wildlife *habitat*, natural resources, air quality, recreational facilities and areas, historical structures, and any other important attribute that individual communities rely on for their well being.

The term "assets" however may not fully convey the community value found in them. They are the precious and often unquantifiable elements that make up the quilted fabric of community life. Humboldt County's communities have evolved with a connection to the land and its history. This has created what could be described as high community value, springing from a shared sense of place, strong family and neighbor ties, and enjoying community life with a *bioregional* flavor.

Some communities contain infrastructure that is critical to the entire county (e.g. hospitals or utilities), which naturally makes the risk of loss much graver in the event of a wildfire. Many of the more populated areas in Humboldt County contain the county's most critical facilities: hospitals, government facilities, major thoroughfares, schools, fire stations, etc. These areas—mainly concentrated along Humboldt Bay and the Highway 101 corridor—have a higher concentration of community resources, thus having a higher asset value. When an area has a concentration of high-value assets in the presence of *hazardous fuels* and a high fire threat, it is considered an area more at risk of loss due to wildfire. *(For more information about fire hazards, see Figure II.1-9. Fire Hazard Severity Zones map in Chapter II.1. Wildfire Environment.)*

Property damage from wildfires can be severe and can significantly alter entire communities. Structures, above-ground infrastructure, critical facilities, and natural environments are vulnerable. Short-term loss caused by a *wildfire* can also include the destruction of commercial assets, timber, wildlife habitat, scenic vistas, and *watersheds*. Watershed destruction then leads to increased vulnerability to flooding. Long-term effects include smaller timber harvests, reduced access to affected recreational areas, and destruction of cultural, ecological, and economic resources, and community infrastructure.

II.2.1. Community and Economic Assets

Population and Demographics

According to the 2010 Census, the total population of Humboldt County was 134,623, which represents a population increase of 8,105 persons (6.4%) since the 2000 Census. With the exception of a population decline that occurred between the years 1960 and 1970 due to reductions in the local lumber industry, the countywide average annual growth rate has been approximately 0.75 percent per year over the last 30 years.

In 2011, approximately 53 percent of Humboldt County's residents lived outside of incorporated areas. Overall growth in incorporated areas was approximately 2.7 percent from 2000 to 2010, while the unincorporated areas of the County grew 3.7 percent during the same time.[1] This is important in regards to wildfire, as unincorporated areas in Humboldt County generally have a higher fire hazard rating than incorporated areas,

Three of the County's seven cities have populations over 10,000: Arcata, Eureka, and Fortuna. Approximately one-third of the County's population resides in Eureka and Arcata, which encompass the Humboldt Bay region, and is the economic center of the County.

Based on the 2010 U.S. Census, per capita income in Humboldt County was $24,025, and the median household income was $40,089 (2010 dollars, adjusted for inflation). It is estimated that

[1] United States (U.S.) Census Bureau. (2012). Humboldt County, California. *State & County QuickFacts*. Retrieved October 25, 2012, from http://quickfacts.census.gov/qfd/states/06/06023.html.

there are 4,354 households with less than $10,000 in income and benefits per year and 12,859 households with $10,000 to $25,000 in income and benefits per year. In total, this represents 23.7 percent of all households in the county.[2] It should be noted that Humboldt State University's student population represents about 6 percent of the County's population (8,046 in 2011).[3] Students often do not work, or work part-time, low-wage service jobs. This can deflate the median household income for the County and inflate the numbers of those who are living below poverty.

Based on 2010 U.S. Census data, 13.2 percent of Humboldt County's population is 65 or older. This is greater than the state average of 11.7 percent. Forty-one percent of the County's over-65 population has disabilities of some kind, and 7.1 percent have incomes below the poverty line. These residents are likely to be less able to create and maintain defensible space and undertake other fire safety actions, hence may require assistance to ensure their homes and properties are fire safe. It is also estimated that 16.5 percent of the County's population is 14 or younger, slightly less than the state average of 20.5 percent.[4]

Communities at Risk

On January 4, 2001, for the purposes of the National Fire Plan, the Department of Interior (DOI) published in the Federal Register a "Notice of Urban-Wildland Interface Communities Within the Vicinity of Federal Lands That Are at High Risk from Wildfire." On August 17, 2001, the DOI added more communities to the Communities at Risk list. All the Humboldt County communities listed in the table below, were part of these original lists of communities designated as "communities within the vicinity of federal lands that are at high risk from wildfire," more commonly known as "Communities at Risk" or CAR.

Nearly all of the populated areas within the county have already been designated CAR either at the federal or state level. The existing CARs are shown in the following table, Figure II.2.1. Humboldt County Designated Communities at Risk. Figure II.2-2. Population and Communities at Risk Map below also shows these existing CARs. **Two additional communities are proposed to be added to the CAR list in this CWPP: Redwood Valley and Titlow Hill.**

Figure II.2-1. Humboldt County Designated Communities at Risk[5]

Place Name	Federal Threat[6]	Federally Regulated[7]	Year Designated
Alderpoint			2001
Alton			2001
Arcata	x		2001

[2] U.S. Census Bureau, American FactFinder. (n.d.). *2006-2010 American Community Survey 5-Year Estimates.* Retrieved October 25, 2012, from http://factfinder2.census.gov.

[3] Humboldt State University College Portrait. (n.d.). *Student Characteristics.*. Retrieved October 25, 2012, from www.collegeportraits.org/CA/HSU/characteristics.

[4] U.S. Census Bureau, American FactFinder. (n.d.) 2010 Profile of general population and housing characteristics: Humboldt County, California. Retrieved October 25, 2012, from http://factfinder2.census.gov/

[5] California Fire Alliance. (2012). *Communities at Risk List.* Retrieved from www.cafirealliance.org/communities_at_risk/communities_at_risk_list

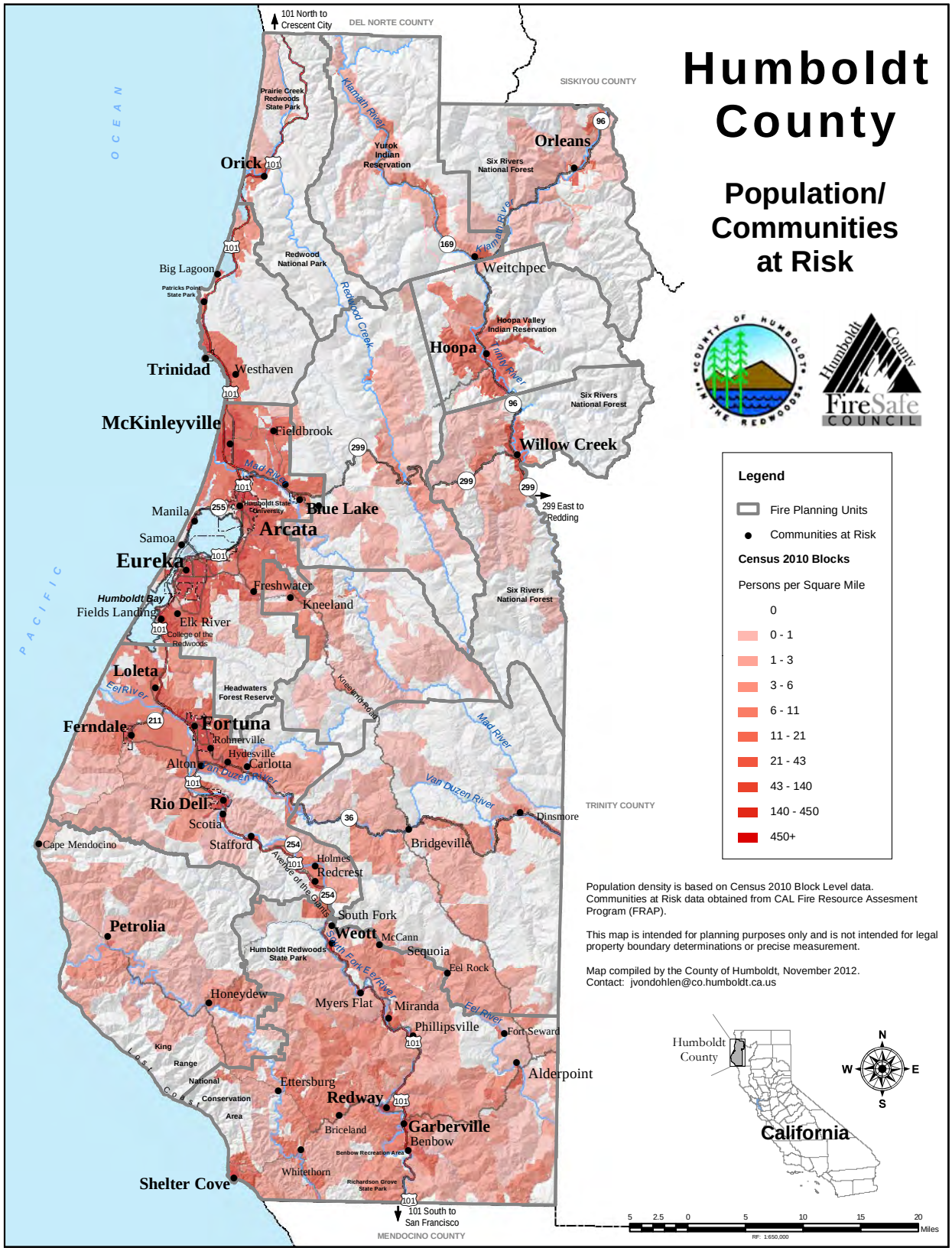
[6] "Federal Threat" refers to communities within 1.5 miles of federal lands.

[7] According to CAL FIRE: "Federally Regulated" refers to land owned by the Federal Government. In these cases, these communities are likely inholdings in federal lands.

Place Name	Federal Threat[6]	Federally Regulated[7]	Year Designated
Bayside	x		2001
Bayview			2001
Beatrice	x		2001
Benbow			2001
Berry Glen	x	x	2001
Big Lagoon	x	x	2001
Big Lagoon Rancheria	x	x	2001
Blocksburg			2001
Blue Lake	x	x	2001
Blue Lake Rancheria	x	x	2001
Bracut	x		2001
Briceland			2001
Bridgeville	x	x	2001
Carlotta			2001
Crannell			2001
Cutten			2001
Essex			2001
Ettersburg	x	x	2001
Eureka			2001
Fickle Hill		x	2001
Fieldbrook			2001
Fortuna			2001
Freshwater			2001
Friday/Morton Ranch	x		2001
Fruitland			2001
Garberville			2001
Holmes			2001
Honeydew	x	x	2001
Hoopa Valley Indian Reservation	x	x	2001
Humboldt Hill			2001
Hydesville			2001
Kneeland			2001
Korbel		x	2001
Kuhn Ranch/Ammon	x	x	2001
Mad River			2001
Maple Creek	x	x	2001
McKinleyville			2001
Miranda			2001
Myers Flat			2001
Myrtletown	x		2001
Orick	x	x	2001
Orleans	x	x	2001
Patrick's Point	x		2001
Pepperwood			2001
Petrolia		x	2001

Place Name	Federal Threat[6]	Federally Regulated[7]	Year Designated
Phillipsville			2001
Pine Hills		x	2001
Pine Mountain			2001
Redcrest			2001
Redway			2001
Rio Dell			2001
Riverside Park/Swains Flat			2001
Rohnerville	x		2001
Scotia			2001
Shelter Cove	x	x	2001
Shivley			2001
Stafford			2001
Trinidad		x	2001
Trinidad Rancheria	x	x	2001
Weitchpec	x	x	2001
Weott			2001
Westhaven-Moonstone	x	x	2001
Whitethorn (Thorn)		x	2001
Willow Creek	x	x	2001

Figure II.2-2. Population and Communities at Risk Map



Homes and Structures

Some land uses, such as single-family rural residential, are more vulnerable to wildfire, while others, such as gravel mining, and cemeteries, are less vulnerable. An analysis of Humboldt County Assessor data found that 59% of all Humboldt County parcels fall within "High" or "Very High" *Fire Hazard Severity Zones* (as determined by CAL FIRE) and that just over 85% of those are residential dwelling parcels.[8] This indicates that a large majority of the parcels within areas with the greatest Fire Hazard Severity zoning are liable to contain homes—one of our most venerable and valued assets. In fact, based on an evaluation of parcels with development potential in Humboldt County, 62% of general plan build-out[9] county-wide could be expected to be in High and Very High Fire Hazard Severity Zones. Therefore, much of the future growth in the county is expected to occur in areas that are more vulnerable to wildfire risk.

It is a well known fact, albeit difficult to quantify, that there are many homes built in Humboldt County without permits. Much of this unpermitted building is believed to be located in rural areas beyond the urban fringe and off the beaten path. One way to identify development that is not reflected in building permit data is through an analysis of the assessed value of parcels. If a property is assessed at a higher value than the base land value, it can be surmised that there is some type of improvement, most likely a structure. The Improved Parcel Map below (Figure II.2-3) provides an illustration of relative location, parcel by parcel, of improvements (i.e. structures) across the county. Another, more general way to illustrate where homes and structures are located is shown in Figure II.2-4. Housing Density Map (based on 2010 Census data).

The seasonal use of some structures is also a factor in terms of wildfire threat. As described below, Humboldt County has a significant tourism economy, which generally means: 1. there are more people in the county during summer months, and 2. cabins and other structures that may be more vulnerable to wildfire are frequently occupied during this time. This is also true of the population increase in autumn, during the marijuana harvest. Many people who are unfamiliar with wildfire safety issues come to Humboldt County during the fall harvest season—which coincides with the time of greatest wildfire danger—and populate areas that are generally of higher fire risk and hazard. Although the total numbers of this population increase are not significant at the county level, they can be significant at the local level, and frequently occur in communities with High or Very High wildfire hazard and risk. Furthermore, these population increases, along with the activities and housing accommodations associated with marijuana harvesting, can contribute to the already considerable wildfire risk in these areas.

[8] A parcel that is categorized by the Assessor for use as single family, multiple family, or rural residential development, including Agriculture and Timber parcels.

[9] The potential development based on the allowed density according to the Humboldt County General Plan.

Figure II.2-3. Improved Parcel Map

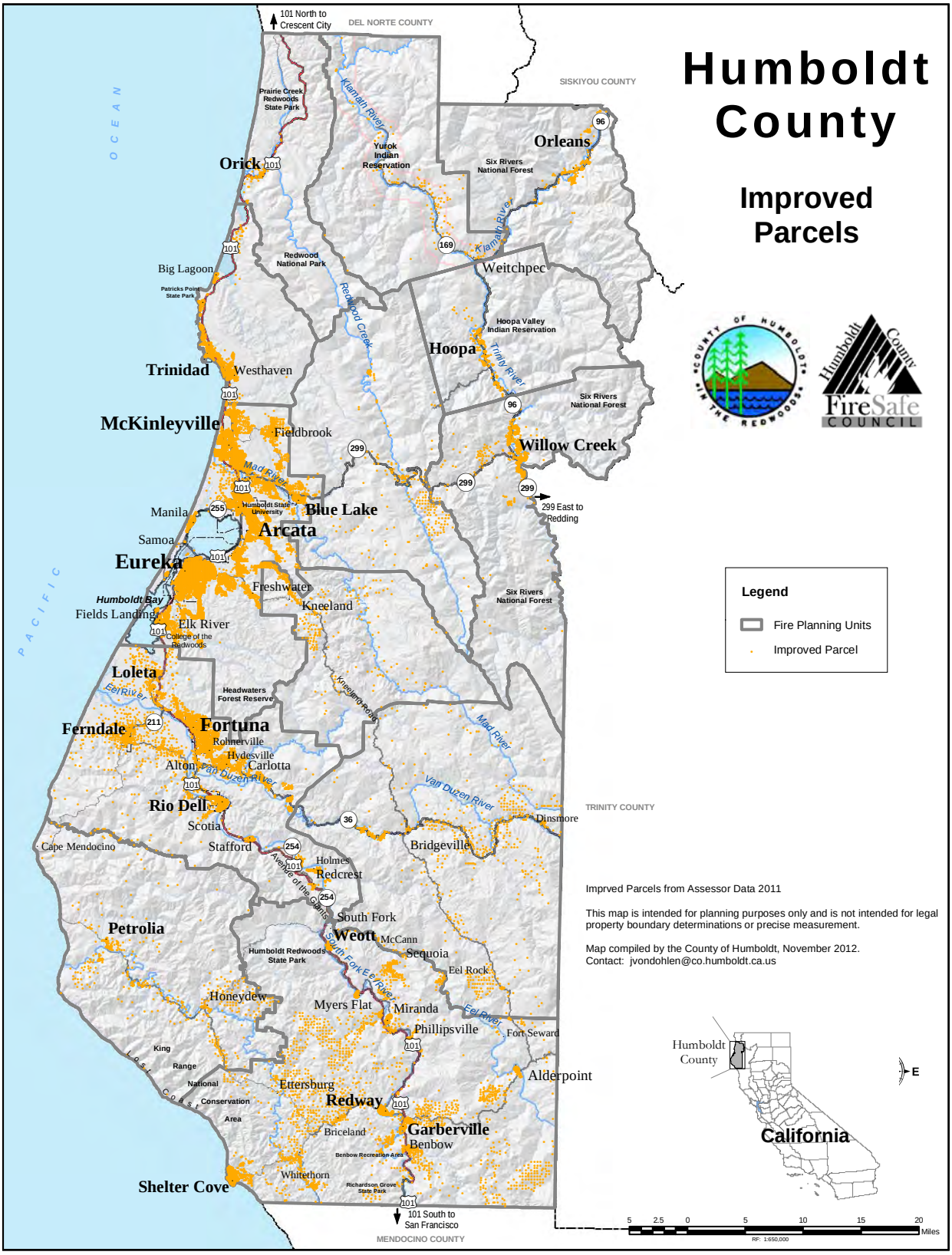
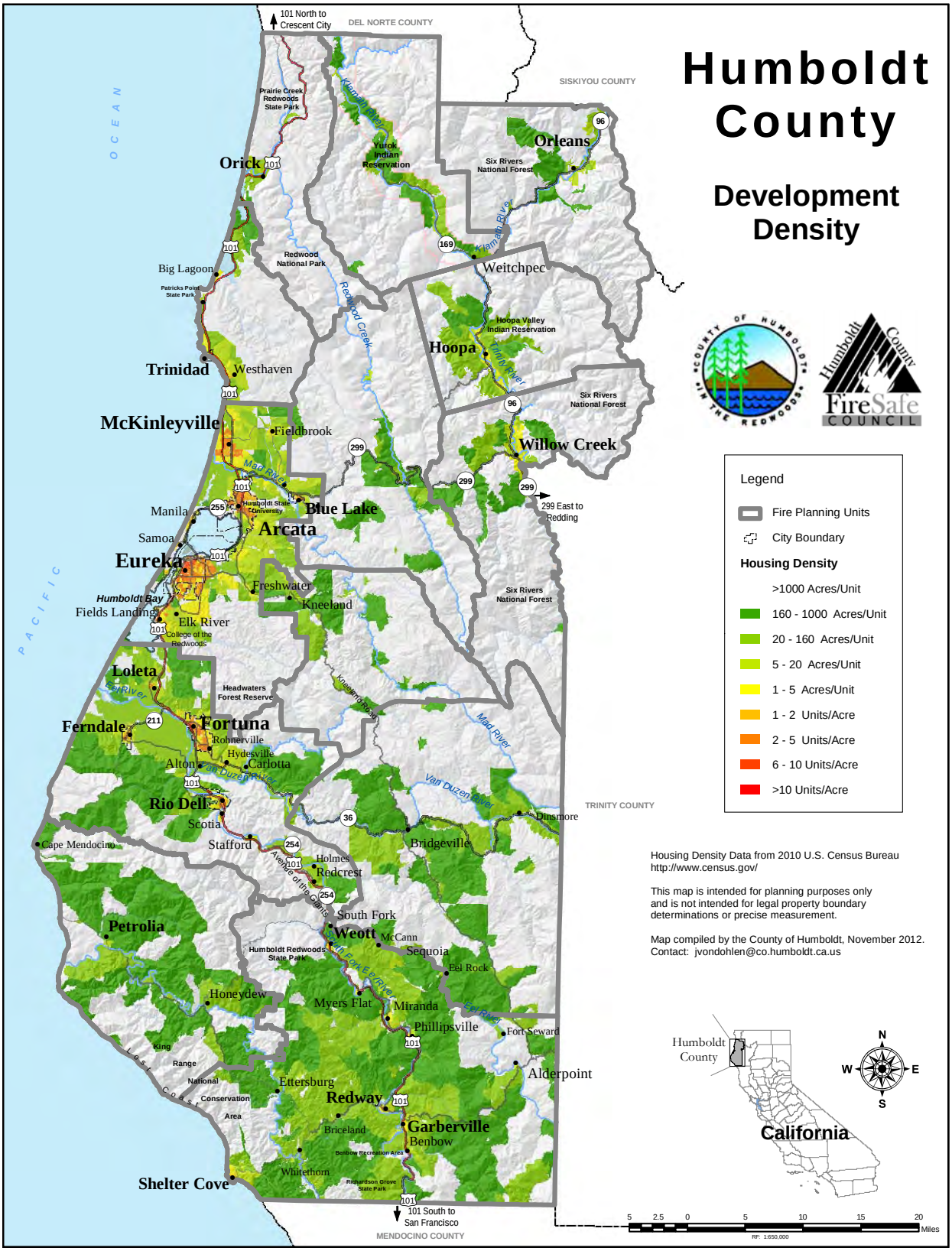


Figure II.2-4. Housing Density Map



Structural Ignitability

As stated, the majority of homes in Humboldt County are built in urban areas, principally those surrounding Humboldt Bay. Historically, redwood and Douglas-fir lumber was the primary building material and these are both extremely flammable when ignited. There is a vast range of construction types in the county, from non-permitted cabins off the electrical grid, to state-of-the art new homes. Older wooden homes generally have higher *structural ignitability* than newer homes, unless they have been retrofitted to current building standards. Homes with non fire-safe roofing and siding are common, as are cantilevered decks with flammable items (e.g. lumber, cardboard boxes, etc.) stored underneath. Relatively few homes and structures in Humboldt County have been lost as a result of wildfire, although this may be due to the fact that few wildfires have burned close to urban areas rather than a reflection of fire-safe construction.

Anecdotal evidence from fire service personnel indicates that structure loss from fire (not wildfire) in Humboldt County has increased in the past decade. Some link this trend to indoor growing of marijuana with the most common *ignition* occurrence resulting from faulty, poorly modified, and/or unpermitted wiring. It is widely recognized that many homes in Humboldt County are now being used for indoor marijuana cultivation. These structures (or at least the wiring within them) are often not up to state *building code* standards. In many cases, there are hazardous items located near the structure, including propane and diesel tanks, generators, and even bales of hay, which are sometimes used as sound proofing material to limit noise produced by generators . The *ignition potential* for these structures is very high, and pose an ignition risk to the surrounding *wildlands*, or urban neighborhoods, as the case may be.

New residential construction permitted in Humboldt County's State Responsibility Areas (SRA) have been built according to the standards of the 2007 California Building Code Chapter 7A: "Materials and Construction Methods for Exterior Wildfire Exposure" (effective January 1, 2008). (Henceforth, in this plan, the Chapter 7A standards will be referred to as the *Wildland-Urban Interface* (WUI) Building Standards.) A noteworthy exception to the WUI standards is new residential construction built with a permit under the County's "Modified Limited Density Owner Built Rural Dwelling Regulations" for alternative owner builders (AOB).[10] Homes built to AOB standards are exempt from the California Building Code (including the WUI code) but must meet the standards for the electrical, mechanical, and plumbing codes. County Building personnel encourage AOB permit applicants to follow California Building Code standards; however, there is no way to verify compliance.

The County began to keep digital records on building permit activity in 1993. Between 1993 and 2008 (up to the effective date of the WUI code) there were 1,263 permitted, new residential structures built. Records indicate that only three of those were built with an AOB permit. This report is believed to be massively understated, due to inaccuracies in permit coding; there were likely many more AOB permits granted in that time period. In 2011, the number of permitted new residential structures built since the effective date of the WUI code (2008) was approximately 313; of those, approximately 54 were constructed with an AOB permit. Confidence in the data is greater for the information provided within this second timeframe.

Commercial and Economic

The local economy was built on natural-resources based industries such as timber production and manufacturing, fishing, cattle ranching, and dairy farming. These industries, although diminishing to varying degrees from historic levels, still contribute a great deal to the local economy. Agricultural and timber lands are also an important element of Humboldt County's identity. Although fire has been used as a tool in rangeland and timber management, wildland fire

[10] The County of Humboldt adopted the AOB regulations in 1984.

can have disastrous consequences to such resources, removing them from production and necessitating lengthy *restoration* programs.

As Humboldt County shifts away from dominant natural resource extraction industries, new innovations are emerging to diversify the economy. According to the Economic Development Element of the 2012 Planning Commission Draft of the Humboldt County General Plan Update:

> "New local industries have emerged that export more knowledge-based, specialty, and technology-driven products and services. In fact, our traditional industries have provided the basis for many of these emerging businesses. Habitat restoration, sustainable forest management, organic milk production, and computer network services are all examples of innovative local products and services that the world needs and wants to buy. These new industries have joined traditional natural resource and agricultural industries to diversify and integrate the County into the global economy."[11]

Although the impact is difficult to measure, it is important to mention that the production and sale of marijuana for medical and illicit use contributes significantly to the economy in Humboldt County. Many assume it is the largest single industry in Humboldt County. One indicator of its impact is that the retail and restaurant sector is much larger than what would be expected for reported income levels. While marijuana dollars spent on local products and services boosts the economy, the industry's use of residential, agricultural, and timberlands can result in environmental impacts and have contributed to increased structure fire and wildfire hazards.

Based on the 2011 American Community Survey 1-Year Estimates, the measurable employment industry type responsible for the most occupations in Humboldt County is the "management, business, science, and arts" sector, making up 35% of the working population. A contributing factor to this employment category reflecting the greatest number of workers is that it includes most of those employed by Humboldt State University, a significant employer in the County. Continuing down the list, the "sales and office occupations" are 23%, "service occupations" are 19%, "natural resources, construction and maintenance occupations" are 15%, and finally "production, transportation, and material moving occupations" make up 8% of total employment in Humboldt County.[12]

The employed civilian population, 16 years and over, in Humboldt County totals 56,462. Of these working adults 50.2% are employees of private company workers; 3.5% are self-employed in their own incorporated businesses; 10.9% are private, not-for-profit wage and salary workers; 23.4% are local, state, and federal government workers; and 12% are self-employed in not-incorporated businesses or unpaid family workers.[13]

Humboldt Bay is the commercial focal point of the county, serving as the major port and center of exchange. The Bay also provides most of California's oyster production and is a significant natural resource. It also includes the Humboldt Bay National Wildlife Area. Much of the county's property value is concentrated around the Bay and surrounding coastal areas where the cities and larger population centers are located; particularly industrial and residential uses.

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[11] Humboldt County General Plan Update. (2012). Chapter 9: Economic Development Element. *Planning Commission Approved Draft General Plan.* Retrieved from www.co.humboldt.ca.us/gpu/documentsplan.aspx

[12] U.S. Census Bureau, American FactFinder. (n.d.). Occupation by class of worker for civilian employed population 16 years and over. *2011 American Community Survey 1-Year Estimates*. Retrieved October 25, 2012, from http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_11_1YR_S2406&prodType=table

[13] U.S. Census Bureau, American FactFinder. (n.d.). Occupation by class of worker for civilian employed population 16 years and over. *2011 American Community Survey 1-Year Estimates*.

Much of these coastal urban and suburban areas are categorized by CAL FIRE as Moderate Fire Hazard Severity Zones, or are not ranked at all. Figure II.2-5 below illustrates Improvement Value by Fire Hazard Severity Zone for comparative purposes.

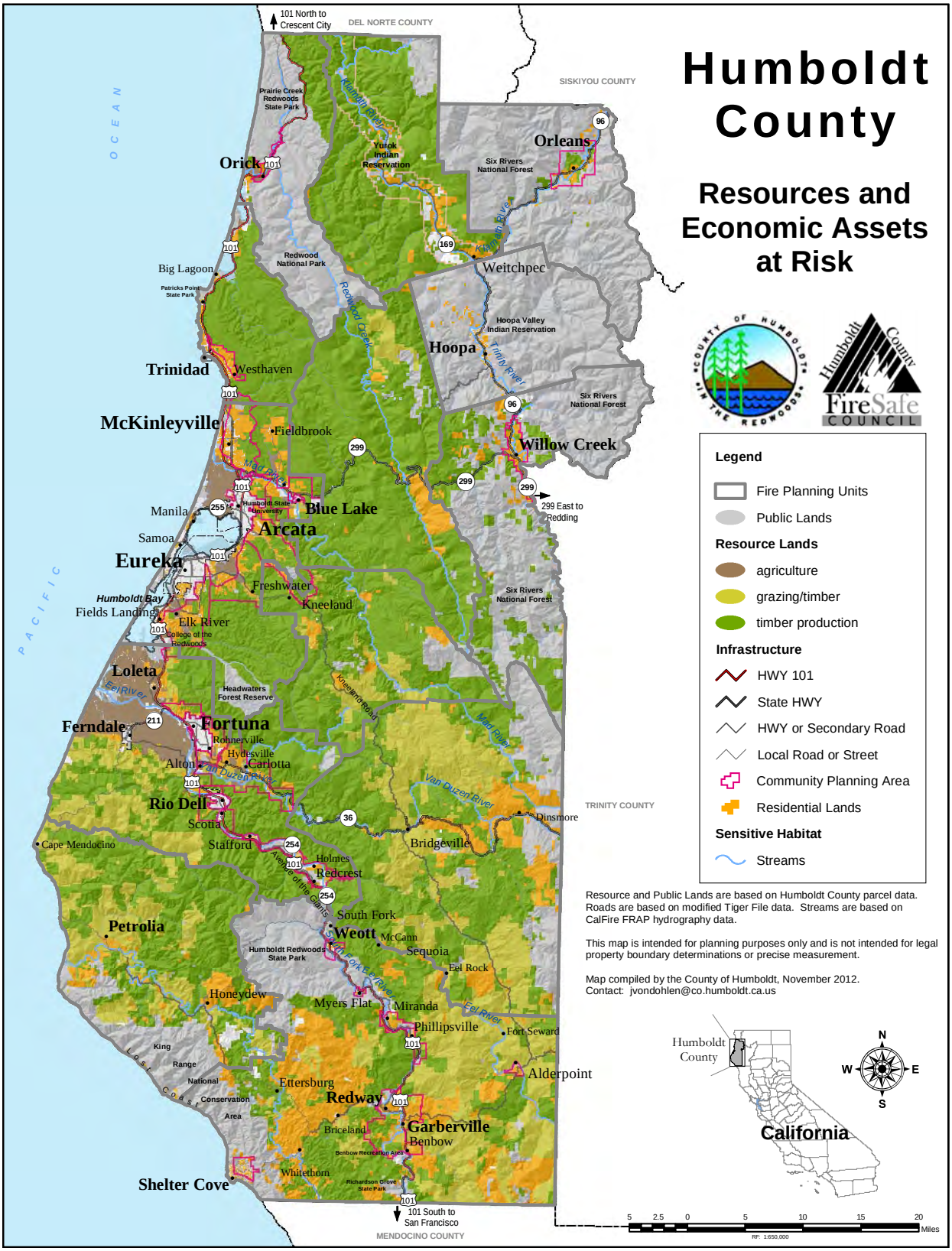
Figure II.2-5. Improvement Value by Fire Hazard Severity Zone[14]

Property Type	Non-Wildland/ Non Urban	Urban Unzoned	Moderate	High	Very High	Total
Agriculture	$6,518		$3,781	$43,785	$11,349	$65,433
Churches /Other Non-profit Org.	$600	$13,876	$7,899	$11,505	$2,740	$36,623
Entertainment & Recreation	$792	$16,459	$23,388	$15,462	$5,060	$61,161
Heavy Industrial	$1,020	$10,129	$12,208		$484	$23,842
Institutional Dormitory		$561	$10,747	$8,752		$20,060
Light Industrial	$158	$36,182	$9,514	$1,750	$175	$47,778
Medical Office/Clinic		$19,906	$14,147	$10,836	$3,732	$48,621
Single Family Dwelling	$36,491	$416,468	$1,030,953	$821,273	$156,005	$2,461,190
Multi-dwellings (3 to 4 units)	$534	$59,731	$66,986	$38,506	$1,200	$166,957
Multi-dwellings (5 to 9 units)	$470	$7,554	$10,429	$10,744	$315	$29,513
Multi-dwellings (10 + units)		$17,728	$2,578	$5,538		$25,843
Nursing Home			$62	$401		$464
Personal and Repair Services	$1,431	$12,492	$27,357	$15,657	$5,472	$62,409
Professional/Technical Services		$4,982	$9,851	$4,265	$73	$19,170
Public			$0	$0	$0	$0
Retail Trade		$16,265	$16,354	$7,165	$5,820	$45,603
Temporary Lodging			$1,884	$15,010	$3,103	$19,997
Utilities		$0	$4	$0	$0	$4
Vacant	$25,060	$3,741	$139,187	$172,675	$45,271	$385,935
Wholesale Trade		$234	$2,200	$54	$259	$2,746
Total	**$73,077**	**$636,304**	**$1,389,530**	**$1,183,337**	**$241,059**	**$3,523,347**

The following map in Figure II.2-6 shows resource lands in Humboldt County (agriculture, grazing, and timber production) as well as primary residential areas. It also outlines the Community Planning Area boundaries used by the County for planning purposes.

[14] Figures are in thousands of dollars.

Figure II.2-6. Resources and Economic Assets at Risk Map



Schools

There are 32 school districts in Humboldt County.[15] The districts collectively operate 73 schools including elementary, middle, and high schools. There are also many local charter schools operating throughout the county. Many of these schools are designated Red Cross emergency shelters. In rural communities with high fire risk, many schools were identified by local residents at community workshops as wildfire *evacuation sites*.

Medical Facilities

Four hospitals are located within Humboldt County. These facilities are essential to the health, safety, and well being of local residents. These critical assets become increasingly valuable in emergency situations and during wildfire incidences. Figure II.2-7. Humboldt County Medical Facilities contains contact information for these facilities.

Figure II.2-7. Humboldt County Medical Facilities

Name	Address	Phone Number
Mad River Community Hospital	3800 Janes Road Arcata, CA 95521	707-822-3621
St Joseph Hospital	2700 Dolbeer Street Eureka, CA 95501	707-443-8051
Jerold Phelps Community Hospital	733 Cedar Street Garberville, CA 95542	707-923-3921
Redwood Memorial Hospital	3300 Renner Drive Fortuna, CA 95540	707-445-8121

General Infrastructure

As each individual community has developed in Humboldt County, vital infrastructure has been built in order to serve the needs of the growing population. Infrastructure includes all of the roads, utilities, water, and all other services that enable Humboldt County residents to live here. The major road systems within the county—Highways 101, 299, 36, and 96 —are crucial assets. *Erosion* and landslides, which are likely to follow a wildfire event in the county, pose a significant threat to the transportation infrastructure. *Fire suppression* efforts also rely on roads to strategically place equipment and firefighting personnel during wildfires.

Power lines are at significant risk to wildfire because most poles are made of wood and are therefore susceptible to burning. Fires can create conditions that block or prevent access throughout the county; fires can isolate residents and prevent emergency service providers from reaching vulnerable populations or to making repairs. Wildfire typically does not have a major direct impact on bridges. However, wildfires can create conditions in which bridges are obstructed. Many bridges in areas of high to moderate fire risk are important because they often provide the only *ingress and egress* for large areas and, in some cases, for isolated neighborhoods.

The public and private utilities within Humboldt County are also important assets. The security of clean water is fundamental to all communities. Increased surface runoff following a wildfire can cause inputs of nutrients, ash, and other particulate matter into the county water

15 Humboldt County Office of Education. (n.d.). *Humboldt County School Districts.* Retrieved October 29, 2012 from http://www.humboldt.k12.ca.us/schdist/index.php.

sources. There are approximately 25 different local agencies[16] that provide water service and an additional 30 mutual water associations[17] of varying sizes throughout the county. These providers supply domestic water to residents and visitors. The larger providers also maintain water for fire suppression. All of these water suppliers are site-specific and service the needs of a particular location. Facilities maintained by these providers, such as treatment plants, pumps, and storage facilities can be damaged during or following a wildfire.

Airports

Nine public airports operate in Humboldt County:

- Arcata-Eureka Airport
- Garberville Airport
- Murray Field Airport
- Eureka Municipal Airport
- Hoopa Airport
- Dinsmore Airport
- Kneeland Airport
- Rohnerville Airport
- Shelter Cove Airport

All but the Eureka Municipal, Shelter Cove, and Hoopa Airports are owned and operated by Humboldt County. Airport master plans for Humboldt County airports are available from the Humboldt County Public Works Department at http://co.humboldt.ca.us/aviation/.

Airstrips are important infrastructure components, as they provide recreational opportunities, emergency landing sites, potential evacuation sites, and facilitate visitors and tourism. Private airstrips exist in Humboldt County that can be used as emergency landing or evacuation destinations; many of which are only known to local emergency responders.

II.2.2. Natural Assets

Natural resources are one of the defining characteristics of Humboldt County and are highly valued by residents for their contribution to the local quality of life. The County's natural resources are also highly significant as economic development assets that attract tourist-related expenditures and outdoor recreationists. Although fire is a natural process in this environment, and low-intensity burns can actually assist ecosystem health, the suppression of wildfire in recent decades has resulted in a buildup of *fuel* and has increased the potential for large fires, which burn with greater intensity than under what were traditionally "natural" conditions. When fires occur under these hazardous conditions (i.e. extreme weather and/or unusually dense fuel loading) they can quickly escalate out of control and threaten the destruction of natural assets that are highly valued by the community. *(See Chapter II.2.1. Wildfire Environment for more information on fire ecology.)*

Scenic

Forested hillsides, working agricultural land, river corridors, coastal areas, and scenic highways provide a range of stunning vistas in Humboldt County. Expanses of beautiful, natural scenery are signature to this region and are a large draw for many people who live in, recreate in, and visit the area.

Coastal Views

Humboldt County's extensive coastline allows for a wide range of exceptional scenic vistas from areas along US 101 and from beaches, state parks and coastal access points. Coastal areas are popular tourist destinations that offer vacationing and recreational opportunities, such as

16 City and District providers.

17 Landowners own shares in these systems rather than paying rates.

hiking and fishing. One prominent example is Patrick's Point State Park, which provides campgrounds and hiking trails that line the craggy headlands. Trinidad Head also offers favorable views from which people can glimpse migratory whales, such as humpback and gray whales. These coastal areas are generally not greatly affected by wildfire; however, large, enduring fires located further inland that produce heavy smoke can negatively affect air quality on the coast.

Forests

Forestlands define much of the visual landscape of Humboldt County, covering more than 80% of the total land area. Forest types vary across the county, with Douglas-fir forests *dominant*, which include different varieties of oak and pine, along with yew, cedar, and hemlock trees. Other forest types include redwood forests, *montane* hardwood forests, and oak woodlands, which provide a range of excellent wildlife habitat. Forest *ecosystems* support a wealth of *biodiversity*, accommodate wildlife migration patterns, and provide sanctuary for many special status species that exist within the county. These valuable ecosystems also support watersheds in this area by retaining massive amounts of water within their healthy, viable soil compositions.

The scenic value of these forestlands, whether they are viewed from within or from afar, are also of great importance, and their vast expanses have become quintessential to the visual character of the area. These natural resources can be highly threatened by wildfire. In addition to their vulnerability to lightning-caused fires, the tendency for these natural resources to draw large numbers of people with their beauty and recreation opportunities increases the likelihood of human-caused ignitions. Furthermore, the logging of many *fire-resilient* old growth forests, followed by the seeding of Douglas-fir among second-generation redwoods have altered *stand compositions* in such a way that makes the forests more vulnerable to wildfire. Fire suppression within the County's forests have also allowed for the accumulation of heavy fuel in the forest *understories* that increases the likelihood of high-intensity fires damaging large amounts of forest cover.

Agricultural Lands

Large swaths of working agricultural land distributed throughout Humboldt County lend a pastoral charm to the scenery of the area. While vistas of immense forestlands create a sense of remote beauty, the rolling agricultural lands within the prairies and flatlands contribute to the rural character of the region. In addition to the dairies and bulb farms in the area, numerous small, organic farms are sprinkled throughout the county. The majority of these agricultural lands do not follow an industrial agriculture model (and therefore contain less chemicals and pesticides), which is beneficial to local biodiversity. These less-developed, ecologically tolerant expanses of land can act as wildlife corridors and facilitate species migration throughout the region. There are also a number of "heritage landscapes" within Humboldt County, which are lands with combined historical, cultural, and scenic values, such as the Arcata and Ferndale Bottoms areas. Although these agricultural landscapes are not especially vulnerable to wildfire directly, they may be impacted by large fires that produce an abundance of smoke, which can have substantial negative impacts on air quality, sun exposure, and may even scatter ash on crops in these areas.

Rivers

Two of California's three largest river systems flow through Humboldt County, along with several other major rivers, whose valley corridors contribute to the scenic quality of the mountainous forests in the region. Portions of many of these rivers are designated as part of the National and/or California Wild and Scenic Rivers Systems; sections of the Eel, Klamath, Trinity, and Van Duzen rivers are designated either "wild," "scenic," or recreational. The rivers in Humboldt County are highly significant natural assets; they are invaluable to the residents of this area, many of whom rely on the rivers for their water. They help attract tourist and recreationist expenditures that assist local economies. They provide crucial habitat for a variety of fish species,

many with important ecological, commercial, cultural, and recreational fisheries value. These life-giving water bodies also help sustain a variety of local vegetation and wildlife species throughout their watershed boundaries.

Riparian assets are highly vulnerable to disturbance from wildfires that may occur in the forests through which the rivers flow. Erosion following fires can cause large *sediment* loads in streams, which may then be transported and deposited into rivers and damage aquatic habitat in riparian areas. By killing or consuming vegetation next to streams and ponds and diminishing the shade it provides, forest fires can have strong and lingering influences on water temperatures, raising them and threatening fish and other aquatic species.[18] Risk of fire starts near river areas is amplified by the popularity of river recreation during summer months, when fire risk is greatest, due to the increase in human population. Wildfires that occur near rivers can also make river recreation unappealing or dangerous, and may dampen tourist enthusiasm for visiting the areas. Finally, firefighting can have significant impacts on local rivers, including water removal during critical late-season flows and use of retardants.

Scenic Highways

Multiple highways throughout Humboldt County have extraordinary scenic qualities because of their unique natural setting. A scenic road is defined as a roadway that, in addition to its transportation function, provides opportunities for the enjoyment of natural and scenic resources. Scenic roads direct views to areas of exceptional beauty, natural resources or landmarks, or historic and cultural interest. Although no highways in Humboldt County are officially designated as California State Scenic highways, several state highways are eligible for official designation:

- Route 36 from Route 101 near Fortuna to the Trinity County line
- Route 101 for its entire length in Humboldt County
- Route 299 from Arcata to Willow Creek
- Route 96 from Route 299 at Willow Creek north to Siskiyou County
- Highway 254, "the Avenue of the Giants," branching off of Route 101 in the southern portion of the County

Local Humboldt County roadways also have significant scenic view values.[19] These important transportation routes can all be compromised by wildfire.

Protected or Environmentally Significant Areas

More than 550,000 acres in Humboldt County are protected open space, forests, and recreational areas. Humboldt County contains four federal parks and beaches, ten state parks, and sixteen county parks and beaches, recreational areas and reserves, and National Parkland and National Forest lands. These protected areas provide valuable habitat for an array of wildlife, fisheries, and special status species. More than 20 species of plants and animals in Humboldt County are listed as *Endangered* or *Threatened* under federal and state classification systems.

Of the 1.9 million acres of forested land, 26% is either encompassed within protected areas or public forested lands; the remainder is privately owned timberland. Redwood National Park, Six Rivers National Forest, Redwoods State Park, Headwaters Forest Reserve, and Kings Range National Conservation Area are all significant, protected forests within the county. These protected forest areas provide natural habitat for a range of species types and enable residents and

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18 Pilliod, D.S., Bury, R.B., Hyde, E.J., Pearl, C.A., & Corn, P.S. (2003). Fire and amphibians in North America. *Forest Ecology and Management 178(1-2), 163–181*.

19 Humboldt County General Plan Update. (2012). Chapter 8: Scenic Resources. *Natural Resources and Hazards (September 2002) Report.* Retrieved from www.co.humboldt.ca.us/gpu/documentsbackground.aspx

tourists alike to appreciate and experience firsthand the majesty of these enduring natural landscapes.

Humboldt County contains numerous ecologically and economically valuable aquatic resources as well; these include wetlands, lagoons, streams, rivers, estuaries, and the Pacific Ocean. These resources are significant on both a regional and statewide level. Humboldt Bay, for instance, is California's second largest *estuary*, and combined with surrounding agricultural lands and the Eel River estuary, is one of the most important migratory waterfowl stopovers along the Pacific Flyway. Humboldt County also has some of the largest and most ecologically important coastal lagoons in the state, including Big Lagoon, Stone Lagoon, and Freshwater Lagoon.

The presence of these *special status species*, migratory birds, and other types of wildlife within protected areas contributes to the value of the County's natural assets, improving the quality of life for residents, attracting visitors from out of the area, and enhancing local ecosystems. These assets are at varying degrees of risk from wildfire. Protected forest and river areas experience the greatest threat, due to existing fuel loads and popularity of recreation locales. Wildlife species within these areas are at risk of habitat destruction from wildfire, which could be especially detrimental to threatened and endangered species whose habitat is already in short supply. Although estuaries and other aquatic resources near the coast are less vulnerable to negative effects from wildfire, smoke-caused air pollution could potentially impact migratory bird species and other sensitive wildlife. Furthermore, large-scale watershed disturbance generated by wildfires further inland can result in loss of vegetative cover near waterways, increased runoff, and severe erosion and sediment production.

Recreational Areas (Seasonal Use)

Numerous opportunities for multiple types of outdoor recreation add to the significance of Humboldt County's many natural assets. Public and protected forests, beaches, parks, and recreation areas contain hiking trails, campgrounds, river access points, and a number of accessible coastal areas that create opportunities for countless recreationists. These natural assets attract backpackers, rock climbers, mountain bikers, day hikers, as well as fisherman, river rafters, sea-kayakers, sail boaters, and surfers, to name a few.

The availability of these recreational areas and resources is necessary for Humboldt County to maintain its competitiveness as a tourist destination. The tourist industry in Humboldt County has continued to grow in significance since the decline of the timber industry, and the region has become well known for its abundance of outdoor recreation opportunities. As this trend in the economy continues, parks and recreational resources will prove of greater and greater value to Humboldt County's future.

Consequently, the degree to which humans impact these spaces will increase as well, and so too will the need to mitigate those impacts. Several regulatory agencies have a stake in and help manage the parks, recreation, and open spaces in Humboldt County, including: the Bureau of Land Management, California Department of Fish and Game, California State Parks, United States Forest Service, local city governments, Humboldt County, local Native American Tribes, and other state and federal regulatory agencies.

Parks, recreation locales, and open spaces are vulnerable to negative impacts from wildfire events. Some areas, such as forests and river valleys, are threatened by the immediate potential impacts of wildfire burning through forest stands and depreciating water quality in streams and rivers. Other areas are at risk of being impacted by poor air and water quality, as well as decreased recreational appeal due to fires blocking access roads, diminishing scenic views, or causing lingering smoke pollution.

Air Quality

Smoke generated by wildfire consists of visible and invisible emissions that contain particulate matter (soot, tar, water vapor, and minerals), gases (carbon monoxide, carbon dioxide, nitrogen oxides) and toxics (formaldehyde, benzene). Emissions from wildfire depend on the type of fuel, the *moisture content* of the fuel, the efficiency (or temperature) of *combustion*, and the weather. Public health impacts associated with wildfire include difficulty in breathing, odor, and reduction in visibility.

Humboldt County is prone to temperature inversions, which occur when a layer of warm air traps cool air near the surface and creates a lid that inhibits the vertical dispersion of smoke and other pollutants. The Megram Fire (Big Bar Complex Fire) burned 135,000 acres between late August and early November 1999 in eastern Humboldt and Trinity Counties, and resulted in the first air-quality related State of Emergency in California history. The smoke from the Honeydew and Canoe fires inundated Southern Humboldt for months. Smoke from the fire was trapped by an inversion layer between late September and early October, causing officials to close schools and encourage residents to leave the area. Those who remained in the affected area were encouraged to remain indoors. *(For more information on maintaining air quality, see Air Quality Regulations in Chapter V.4.2. Environmental Protection Compliance.)*

II.2.3. Cultural Assets

The indigenous people of what is today Humboldt County occupied specific territories, spoke languages of several different stocks, and had similar but distinct social and cultural structures. The Wiyot, Yurok, Hupa, Karuk, Chilula, Whilkut, and the southern Athabascans, including the Mattole and Nongatl practiced lifeways carefully prescribed by cultural and religious mores.

The Humboldt County General Plan Cultural Resources Section provides an overview of culturally sensitive resources in the county (Humboldt County, 1984):

> "Before European settlement, the Humboldt County area was one of the most culturally diverse regions of California, being home to nearly a dozen distinct peoples. In large part, Native American tribes occupied land areas conforming largely to the natural watershed basins. Culturally sensitive areas are sites and regions of special importance to Native Americans, primarily coastlines and riverbanks with outstanding religious or resource-producing importance. Over 32,000 acres of land in Humboldt County are designated as culturally sensitive, with notable concentrations along the Lower Klamath, the Lower Trinity, lower end and North Fork of the Mad, and the Van Duzen Rivers, and the eastern shore of Humboldt Bay."[20]

Culturally sensitive areas exist on both public and private lands. While some locations are publicly identified, others are held as confidential information by local Native American organizations. Many cultural sites are at risk of incidents of wildfire. Fire can destroy artifacts and structures. However, a light fire can clean an area of *litter* and ground fuel, exposing new cultural sites and artifacts without causing significant damage. The discovery of these cultural sites can be a benefit to archeologists and Native American groups, but can also present problems of looting and vandalism.

II.2.4. Community-Identified Local Assets

In early 2012, sixteen Community Wildfire Protection Plan (CWPP) public meetings were held throughout Humboldt County. At these meetings, local community assets from the 2006

[20]Humboldt County General Plan, Volume I, Framework Plan (1984) Chapter 3b: Biological Resources, Section 3500: Cultural Resources. Retrieved from http://192.168.1.3/planning/Genplan/Framewk/index.htm

Plan were reviewed and confirmed and, in some cases, additional assets were added. Some of the most important community assets and values identified at these meetings included schools, community centers, churches, fire stations, hospitals, senior centers, neighborhoods, commercial districts, golf courses, campgrounds, and more. A map at the end of each Planning Unit Action Plan in Part IV of this Plan illustrates these assets and values at risk to wildfire. These can be used as a key to access detailed descriptions of the identified assets on the Humboldt County Web GIS Portal, "Fire Planning" section, http://gis.co.humboldt.ca.us/.

II.2.5. Conflicts between Natural Assets and Human Occupation

Human settlement affects wildland fire, including the potential for wildfire starts and prescribed fire and wildland fire uses. Natural resource lands, primarily forestlands, surround many unincorporated communities in Humboldt County. The areas where communities abut natural resource lands are known as the wildland-urban interface (WUI). The interface is often an environmental condition where a mix of fuel, weather, and topographical conditions create conditions that put a community at risk to wildfire. A WUI is an area of increased human influence and land use conversion. Population and demographic trends, economic and tax issues, and land-use planning and policy issues all play a part in influencing the interface. These factors are important to understand, as are the consequences of human influences on forest ecosystems, in order to establish an ecological framework for planning and policy affecting the WUI.

Human encroachment into wildland areas with higher fuel hazards creates a conflict that often threatens life, property, and the natural environment. For example, most wildfires occur in Humboldt County in late summer and/or early fall, when water levels in local rivers and streams can be very low. Conflicts have arisen in the past over *bucket dipping* into and water drafting out of rivers for fire-fighting water during late summer when native salmon and steelhead, and their habitat, is most vulnerable.

All *vegetation types* found within Humboldt County have the potential to carry wildfires. In fact, most vegetation communities in the county are dependent to some extent on fire occurrence to remain healthy and viable. At the same time, wildland areas are often aesthetically pleasing and create an atmosphere in which many people seek to live. This is quite apparent here, as trends show residents slowly expanding into remote areas that are beautiful but flammable, such as Willow Creek, and the WUI areas east of Humboldt Bay, such as Kneeland. The greatest threat generally occurs on the border of human development where the wildland meets the edge of communities, although wildfire can cause destruction to houses located well inside these communities, especially in the case of large ember storms. Given these communities' exposure and vulnerability to wildfire, taking steps to enhance local fire awareness and preparedness should be a top priority for residents living within the WUI in Humboldt County.

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II.3. Wildfire Protection Capabilities

Fires in Humboldt County fall into two general categories: *wildland fires*, which emanate from forest, grassland, or open *chaparral*; and *structural fires*, which damage homes and workplaces and may spread to other areas, including the *wildlands*. Three distinct types of wildland fire have been defined, they include: wildfire, wildland fire use, and *prescribed fire*. Wildland fire response is most often concerned with addressing *wildfires*, which are unplanned or unwanted wildland fires, such as unauthorized human-caused fires and escaped prescribed fire projects, where the objective is to put the fire out. In general, wildland fire management is the responsibility of federal and state agencies (especially in the case of public lands). Structural fire protection is the primary responsibility of local agencies and organizations, such as fire-related districts and volunteer fire companies.

The local fire protection organizations in this county provide *all-risk fire protection* meaning that they are called upon to provide *structural fire protection* as well as wildland fire management services, respond to medical emergencies, perform technical rescue, respond to *hazardous materials* incidents, and assist with general disaster management. Sate and federal firefighters will also respond to a broad array of emergencies beyond just wildfires depending on their availability. They do not, however, generally have the proper equipment to enter a burning structure and their primary focus is to protect federal and state wildland areas.

There are three specific land classifications to identify the agency with the financial responsibility for preventing and suppressing wildfire. These are the following:

- The Local Responsibility Area (LRA) is primarily the responsibility of the local jurisdiction.
- The State Responsibility Area (SRA) is primarily the responsibility of the state.
- Federal Responsibility Area (FRA) is primarily the responsibility of a federal government agency.

Only a small portion of the county is classified as LRA. The majority of the local fire agencies contain SRA lands within their jurisdictional boundaries (many are comprised solely of SRA). Although local agencies are responsible for structural fire protection and wildland fires that occur in the LRA, CAL FIRE retains responsibility for grass and forest fires in SRA lands that are within the boundaries of a local agency. CAL FIRE and local fire departments work together on fires that involve areas classified as SRA within local jurisdictional area.

Agencies will sometimes enter into agreements to assume responsibility for fire prevention and suppression in one another's responsibility areas. These contracted areas are then called Direct Protection Areas (DPA). There are several DPAs in the county and they are discussed in more detail in Section II.3.3 and illustrated in the map found in Figure II.3-8.

Humboldt County has an extraordinarily strong and effective *mutual aid* system, among all agencies and for all types of emergency response. Mutual aid is a reciprocal aid agreement between two or more agencies that defines what resources each will provide to the other in response to certain predetermined types of emergencies. Mutual aid response is provided upon request.

An automatic mutual aid (auto aid) agreement is another type of agreement to ensure that, within specified areas of a fire department's response area or for certain types of incidents, their automatic mutual aid partner will be automatically dispatched to an emergency and a special request for help will not be necessary. The auto aid responses provide an improved level of service to areas that are often adjacent to the boundaries of a neighboring agency. Having neighboring resources automatically assisting on these calls enables the responsible fire service

provider to keep some resources within their response area in the event of additional calls. Several fire service providers within Humboldt County have auto aid agreements in place.

Regardless of their official responsibilities, and often beyond what might be considered within their capabilities, local fire departments are quick to assist each other as well as state and federal partners, and vice versa. Local firefighters, paid and volunteer, can often be found working alongside state and federal "resources" in their efforts to extinguish house fires, respond to medical emergencies, and manage wildfires within the county boundaries and beyond. Depending on the specific incident, fires may be managed under a unified command between multiple departments or one department may simply assist the other, depending on who has the protection responsibility.

Emergency response capability is ascertained in this Community Wildfire Protection Plan (CWPP) through the identification, definition, and analysis of the delivery of services and level of coverage provided by fire-protection organizations that currently exist in Humboldt County. The following sections contain a detailed discussion of five topics that shed light on the level and type of emergency response provided in Humboldt County, and what the critical needs are to sustain services and ensure community safety.

- Fire Protection Organizations
- Emergency Services Delivered
- Fire Protection Level of Service
- Fire Protection Support
- Evacuation Routes and Vulnerability

This assessment of countywide emergency response capabilities can be used to identify gaps in service and organizational needs. It can also inform important decisions related to the allocation of resources and provide a basis from which countywide fire-risk reduction measures can be implemented.

II.3.1. Fire Protection Organizations

In response to a diverse range of service demands, the County receives fire protection and related emergency services from a variety of fire organizations. The County's fire organizations are divided into two primary categories: 1) federal, state, and tribal agencies; and 2) local fire organizations. Figure II.3-1 below lists types of fire departments in each of these two categories. Each Planning Unit Action Plan in Part IV of this CWPP provides additional, site-specific information about each of these organizations and agencies.

Figure II.3-1. Organizations Providing Fire Protection and Related Emergency Services in Humboldt County

Organization Type ***Local Fire Organizations***	**Area Served**
City Fire Departments	Eureka (operationally combined with Humboldt Fire Protection District #1 as "Humboldt Bay Fire"), Trinidad
Fire Protection Districts (formal jurisdictional area with some type of tax support)	Arcata, Blue Lake, Bridgeville, Briceland, Ferndale, Fortuna, Garberville, Humboldt Fire Dist. #1 (operationally combined with Eureka City Fire as "Humboldt Bay Fire"), Kneeland, Loleta, Myers Flat, Petrolia, Redway, Rio Dell, Samoa Peninsula, Telegraph Ridge, Whitethorn, Willow Creek
Community Service Districts	Carlotta, Fieldbrook, Miranda, Orick, Ruth Lake, Scotia, Weott

Organization Type	Area Served
Other Special Districts or Agencies	Humboldt County Service Area #4 (between Crannell and Orick), Resort Improvement District #1 (Shelter Cove)
Volunteer Fire Company (no formal jurisdictional area or tax support base)	Alderpoint, Fruitland Ridge, Korbel Fire Brigade, Honeydew, Orleans, Palo Verde, Phillipsville, Redcrest, Salmon Creek, Sprowel Creek, Westhaven, Whale Gulch
Federal Agencies	
US Forest Service	Six Rivers National Forest, with fire stations in Orleans, Willow Creek, and Fortuna
National Park Service	Redwood National Park, with a fire station near Orick
Bureau of Land Management	Arcata Field office, with a fire station near Whitethorn
State Agencies	California Department of Forestry and Fire Protection (CAL FIRE), Humboldt-Del Norte Unit, with fire stations in Honeydew, Whitethorn, Garberville, Alderpoint, Weott, Bridgeville, Fortuna, and Trinidad.
Tribal Agencies & Organizations	Hoopa Valley Wildland Fire Department, Hoopa Valley and Yurok Volunteer Fire Companies

Local Fire Organizations

Local fire departments are as diverse as the communities they represent. The County's fire departments range in composition from a paid, full-time city fire department (the City of Eureka), to very rural volunteer fire companies whose members house fire engines at their own residences. The diversity of Humboldt County's fire organizations becomes problematic when attempting to establish countywide standards of coverage, define operational capabilities, and analyze fire resource deployment. Gaining a better understanding of fire organization characteristics and response capabilities will aid in these endeavors.

Humboldt County's local fire service includes a combined total of 42 fire protection organizations. This includes seventeen Fire Protection Districts, seven Community Service Districts, fourteen Volunteer Fire Companies (two are tribal), two other Special Districts, and two City Fire Departments. Figure II.3-2 provides a summary of local fire department staffing, firefighting apparatus, and station capabilities. The service areas of these local fire departments and companies are illustrated in Figure II.3.3. Local Fire Protection map.

Local fire departments assume a number of different forms as agencies, joint powers authorities, and associations. The following is a description of local-level fire organizations in Humboldt County. Each sub-heading is followed by the number of fire organizations of that type, in parentheses.

County Service Area (CSA) – (1)

County Service Areas (CSAs), authorized under §25210.1 of the Government Code, are generally single purpose, dependent special districts governed by the County Board of Supervisors. In Humboldt County, there is one fire related CSA, called CSA No. 4. CSA No. 4 is essentially a funding mechanism developed to provide structural fire protection in the coastal area located south of Orick and north of Crannell, not including the City of Trinidad. Through an *Amador Agreement,*[1] the County contracts with the California Department of Forestry and Fire

[1] The Amador agreement continues CAL FIRE staffing and station coverage through the winter "off season" and is defined in: California Public Resources Code, sections 4143 & 4144 (2005).

Protection (CAL FIRE) to provide structural fire protection within CSA No. 4. The Westhaven Volunteer Fire Company also provides service within CSA No. 4, but is not a recipient of CSA No. 4 funding.

Community Services Districts – (7)

Community Service Districts (CSDs) are sometimes called junior cities and are authorized under §61000 et seq. of the Government Code. CSDs can provide a broad range of municipal services (primarily to unincorporated areas), including fire protection. CSDs are normally governed by a five-member elected Board of Directors and can receive revenue from taxes and fees. In cases where a CSD is responsible for fire protection in Humboldt County, services are provided by a volunteer fire department with facilities and funding provided by the CSD. These are listed above in Figure II.3-1. Two CSDs in Humboldt County, Carlotta and Ruth Lake, provide fire protection and no other services. Most of the Ruth Lake CSD is located in Trinity County, along with the District's fire station and firefighters.

City Fire Departments – (2)

The cities of Eureka and Trinidad have city fire departments. The City of Eureka is the only city in Humboldt County that provides fire protection services with full-time staff members. The City of Eureka's fire department is staffed with career firefighters and the department also maintains a contingent of volunteer firefighters. The City fire department is operationally combined with Humboldt #1 Fire Protection District under a single fire chief. Humboldt Bay Fire represents the consolidation of the Eureka Fire Department (protecting the City of Eureka) and the Humboldt No. 1 Fire Protection District (protecting the greater Eureka area, outside the City limits). Consolidation talks were ongoing for 50+ years until finally in 2012 the Humboldt Bay Fire Joint Powers Agreement was signed in November of 2012, officially combining the two entities.

The City of Trinidad receives service from an all-volunteer city fire department. All other cities in the county receive fire protection services from a volunteer fire department associated with a fire protection district.

Fire Protection Districts – (17)

Fire Protection Districts (FPDs) are authorized under §13800 et seq. of the California Health and Safety Code to provide fire protection and emergency medical services. FPDs are generally governed by a three- or five-member, elected Board of Directors. The Board of Supervisors (BOS) governs three of the FPDs in Humboldt County and, in these cases, it is the BOS that appoints a local board of fire commissioners. The majority of the FPDs in Humboldt County are staffed entirely by all-volunteer fire departments. These are listed above in Figure II.3-1.

Volunteer Fire Companies – (14)

Volunteer firefighters are the fire protection backbone of rural Humboldt County. Although almost all fire departments in Humboldt County are staffed by volunteers, most departments are associated with a local government organization such as a city or special district. Ten local fire departments have no government affiliation; these are listed above in Figure II.3-1. Most *Volunteer Fire Companies* (VFCs) are organized pursuant to Health and Safety Code §14825 et seq., or by other means, and these organizations often establish themselves as non-profit 501(c)3 corporations. However, two VFCs in the County (Hoopa and Yurok) are supported by Tribal governments, and one (Korbel) is supported by a timber company.

Resort Improvement District – (1)

Resort Improvement Districts (RIDs) are authorized under §13000 of the Public Resources Code to provide a broad range of services (similar to CSDs) to unincorporated areas that are occupied seasonally for recreation/resort purposes. In Humboldt County, RID No. 1 provides municipal services to the community of Shelter Cove; and the RID provides fire protection services through the Shelter Cove Volunteer Fire Department.

The following table summarizes the fire stations, equipment available, and number of firefighters (both paid and volunteer), for each of the 42 local fire organizations in Humboldt County.

Figure II.3-2. Local Fire Service: Station, Apparatus, and Staffing Capability

LOCAL FIRE ORGANIZATION[2]	**FIRE STATIONS**[3]	**FIRE APPARATUS** (water tender, engine, ladder, quick attack, & rescue)	**FIREFIGHTERS**	
			CAREER	VOLUNTEER
Alderpoint Fire Company	1	4	0	12
Arcata Fire Department	3	10	22	25
Briceland Fire Department	3	8	0	18
Blue Lake Fire Department	1	6	1	24
Bridgeville Fire Department	1	4	0	10
Carlotta Fire Department	2	6	0	12
County Service Area No. 4[4]	1	1	8	0
Fieldbrook Fire Department	1	4	0	22
Ferndale Fire Department	1	7	0	40
Fortuna Fire Department	3	15	1	68
Fruitland Ridge Fire Company	1	3	0	8
Garberville Fire Department	1	3	0	12
Honeydew Fire Company	4	5	0	14
Hoopa Fire Company	1	4	0	14
Humboldt Bay Fire Department[5]	5	16	58	25
Kneeland Fire Department	1	3	0	8
Korbel Fire Brigade	1	1	0	22
Loleta Fire Department	1	7	0	30
Miranda Fire Department	1	3	0	12
Myers Flat Fire Department	1	2	0	3
Orick Fire Department	1	4	0	10

[2] The label "Fire Department" identifies service associated with a special district and "Fire Company" or "Brigade" identifies non-tax, non-district organizations.

[3] Local fire stations, particularly in remote rural areas, can consist of only a basic fire apparatus shelter or even apparatus that is regularly stored at a volunteer firefighter's home.

[4] Services for CSA No. 4 are provided by CAL FIRE. The numbers reflected in this table are the year-round available resources. During the fire season there are two fire engines and 14 firefighters available.

[5] Humboldt #1 Fire Protection District and City of Eureka Fire have operationally combined their resources under the name of Humboldt Bay Fire but have not yet officially consolidated their jurisdictions.

LOCAL FIRE ORGANIZATION[2]	FIRE STATIONS[3]	FIRE APPARATUS (water tender, engine, ladder, quick attack, & rescue)	FIREFIGHTERS	
			CAREER	VOLUNTEER
Orleans Fire Company	1	4	0	12
Palo Verde Fire Company	1	2	0	8
Petrolia Fire Department	1	7	0	18
Phillipsville Fire Company	1	3	0	3
Redcrest Fire Company	1	2	0	6
Redway Fire Department	1	5	0	11
Rio Dell Fire Department	1	6	0	23
Salmon Creek Fire Company	1	2	0	8
Samoa Peninsula Fire Department	2	4	0	14
Scotia Fire Department	1	6	0	19
Shelter Cove Fire Department	1	9	0	12
Sprowel Creek Fire Company	2	2	0	30
Telegraph Ridge Fire Department	1	3	0	10
Trinidad Fire Department	1	3	0	10
Weott Fire Department	1	2	0	8
Westhaven Fire Company	1	5	0	15
Whale Gulch Fire Company	1	3	0	16
Whitethorn Fire Department	1	4	0	13
Willow Creek Fire Department	1	5	0	22
Yurok Fire Company	2	1	0	10
Total	58	194	90	657

Source: 2012 CWPP Local Fire Protection Survey, the 2012 Humboldt County Fire Chiefs' Association Annual Report, and personal communication.

Federal, State, and Tribal, Agencies

Federal, state, and tribal agencies providing wildland fire protection in Humboldt County include: the US Forest Service (USFS) – Six Rivers National Forest, Redwood National Park Service, Bureau of Land Management (BLM), Hoopa Wildland Fire Department, and CAL FIRE. The resources provided by these agencies are primarily funded for wildfire suppression operations. These agencies have the greatest number of resources available during *fire season*. (Fire season in Humboldt County normally spans from late May/early June through early October.) Collectively they provide services to Humboldt County from a total of 32 fire stations, with 41 fire engines, using 384 fire personnel (212 full time and 172 seasonal), and two *dispatch*/communications centers. A portion of these stations, engines, and personnel are located outside Humboldt County, but are available to provide service within the County.

II.3.2. Emergency Services Delivered

Fire-protection organizations are called upon to provide a range of emergency-response services, including wildfire and community (structure) fire protection, medical aid, technical rescue, hazardous materials containment and control, and general assistance with disaster

management. In fact, all local fire organizations have a far greater percentage of calls for medical aid than calls for fire protection. Effective response to such a variety of emergency situations necessitates extensive coordination between fire-protection personnel and, in some cases, also requires involvement from other emergency-service agencies within the county and the state.

Initial Response and Dispatching Services

In order to initiate a response from fire-protection organizations for the services they provide, a call must go out, notifying them of an incident. This call can be initiated based on a variety of detection sources. For example, the detection mechanisms utilized by the Six Rivers National Forest (SRNF) include fire *lookouts*, fixed-wing reconnaissance aircraft, vehicle patrols during high fire danger, and automated lightning detection. Many structure fires and medical emergencies are called in by citizens who are involved in or witness an incident.

When 9-1-1 is dialed, the call goes to one of two locations, depending on where the call initiated. 9-1-1 calls that originate from cell phones are initially routed to the California Highway Patrol (CHP); calls that originate from a landline will be answered by a Public Safety Answering Point (PSAP). Some cities have their own PSAP (Eureka, Arcata, and Fortuna as well as Humboldt State University), while unincorporated areas are answered by the Sheriffs Department. The Sheriffs Department, the applicable PSAP, or the CHP will then determine the nature of the emergency call. If the incident is determined to require law enforcement resources, then the responsible law enforcement entity is dispatched. If the incident requires fire and/or ambulance response, then the call will be transferred to the appropriate dispatching facility. The choice of dispatch center depends on the location of the incident and the dispatching service utilized by the nearest fire protection organization and/or ambulance service.

The Fortuna Interagency Command Center (FICC) is the command and control point for many emergency agencies in Humboldt and Del Norte Counties. The FICC is located in Fortuna on the grounds of the CAL FIRE Humboldt-Del Norte Unit Administrative Headquarters. Personnel from CAL FIRE and the USFS jointly staff the FICC. CAL FIRE staff is available 24 hours a day, 7 days a week.

The FICC provides dispatching services for the Humboldt Dispatch Cooperative, which includes all but four of the 42 local fire protection organizations in Humboldt County, as well as the Fortuna Ambulance Company. Arcata Fire Department is dispatched by CAL FIRE but through a separate contract and not through the Humboldt Dispatch Cooperative. Humboldt Bay Fire is dispatched by the Eureka Police Department; the Fortuna Fire Department is dispatched by the Fortuna Police Department; and the Hoopa Fire Department, Hoopa Wildland Fire Department, and Hoopa Ambulance are dispatched by the Hoopa Tribal Police Department. The Sprowel Creek and Korbel Volunteer Fire Companies are dispatched through a variety of systems, including internal business communications, phone trees or *call downs*, C.B. radios, vehicle horns, and calls through 9-1-1. In addition to the dispatch services provided by CAL FIRE and local police departments, many fire departments have a backup system using cell phones, radios, and pagers.

The FICC operates as a secondary PSAP. As required by State law, 9-1-1 calls are initially answered by Law Enforcement agencies. The CAL FIRE dispatchers are all experienced fire captains with extensive field experience. They are also Emergency Medical Dispatcher (EMD) qualified, which allows them to initiate patient care during the call by providing instructions to the reporting party. They work straight through 72-hour shifts (three days on duty). This creates a situation in which the risk of mistakes increases due to fatigued staff. Some additional operators have been added but increased staffing will still need to be considered in the near future.

CAL FIRE staff answers calls and provides dispatch services for local fire protection resources under two separate Amador Agreements, one with the County of Humboldt and one with the Humboldt County Dispatch Cooperative. These agreements pay for the additional expenses

incurred by CAL FIRE for staffing the FICC 24/7 year-round. CAL FIRE pays for the base costs of operating the FICC. The agreements currently cover less than 15% of the total operation costs. The agreement for local dispatch services is between CAL FIRE and the County and does not involve the Forest Service.

The Humboldt Fire Dispatch Cooperative was formed in the mid-1980s after the emergency 9-1-1-phone system was implemented throughout the county. The Fire Dispatch Cooperative was intended as a simple and cost effective means of notifying fire service providers in the event of an emergency. The Humboldt Fire Dispatch Cooperative is a Joint Powers Authority made up of 38 fire organizations (including FPDs, CSDs, a city fire department, and VFCs).

The *fees* that members of the Fire Dispatch Cooperative pay for the services of the FICC are based on the average number of calls received for that department over the last several years. The cost of providing the service is determined by CAL FIRE and billed to the Fire Dispatch Cooperative, who then charges each member department proportionately. The FICC is also the coordination point for fire and rescue mutual-aid resources through the State Office of Emergency Services (the CAL FIRE Unit Chief serves as the OES Operational-Area Coordinator). All requests for mutual aid from outside the area are funneled through the FICC.

The FICC is also the dispatch center for wildland-fire emergencies in the SRA in Humboldt and Del Norte Counties as well as for SRNF lands. Finally, the FICC is the centralized *logistical ordering point* for all federal agencies with wildfire potential on their lands. This includes Hoopa Valley Tribal lands, Redwood National Park, and Humboldt Bay National Wildlife Refuge.

Wildland Fire Response

Wildland fire response, typically the primary responsibility of the state and federal agencies within the SRA and FRA, is described in terms of "readiness to respond," *fire hazard* considerations (e.g. weather), resources available, and the fire management objectives of the response. Federal, state, and tribal fire agencies have *fire suppression* responsibilities within the SRA and FRA. In many cases, local fire departments are the first unit on scene or are asked to assist in fire suppression by the responsible agency. However, local fire departments do not typically have the resources to manage a large wildfire incident, nor is wildfire protection a primary responsibility of most local departments.

The resources called upon to respond to a wildfire depend on the location of the fire, the time of year, and the availability of firefighting personnel and equipment. By agreement, CAL FIRE and the USFS operate using the "closest resource concept:" dispatching the closest fire protection resources to reported fires. Local government fire departments are also dispatched to fires within their response areas and to mutual aid requests.

Command of the incident is established upon arrival of the first fire protection unit at the scene. The *Incident Commander* then evaluates the conditions and the potential of the incident, and requests additional resources as needed. The resource order[6] is then modified as required by the incident. This produces an appropriate, proportional response to wildfires, based upon predicted *fire behavior* conditions.

Large wildfires do not respect jurisdictional boundaries. Therefore, they are generally managed through a coordinated multi-jurisdictional effort, based on availability of resources, *assets at risk*, weather conditions, and many other logistical factors specific to each individual incident. Such fires are managed cooperatively through a unified fire incident command structure.

When large wildfires necessitate regional resources, the California Emergency Management Agency (Cal EMA) Fire and Rescue branch will act as support. In most cases, the Humboldt

[6] Resource orders are made for the appropriate number of fire engines, firefighters, and other resources that are needed for the incident.

County Operational Area (OA) Coordinator (in Humboldt County this is the CAL FIRE Unit Chief) will direct requests for mutual-aid assistance through the appropriate state Cal EMA Fire and Rescue Coordinator. Additionally, Cal EMA Fire and Rescue will provide the use of Cal EMA Apparatus Fleet, communication vans, and other Cal EMA fire service resources as needed.

On National Forest lands, wildland fires can be managed for one or more objectives based on the Land and Resource Management Plan and/or Fire Management Plan direction. These objectives could range from protection of life and property by aggressively suppressing the fire to managing the fire to meet resource-management objectives. All wildfires receive an initial dispatch response according to fire danger, resource availability, and response-area characteristics. This response may be changed according to changes in management objectives for the fire. Most fires escaping *initial attack* will initiate the Wildland Fire Decision Support System and the agency administrator will clarify their intent, as well as incident objectives and management requirements, for managing the fire.

Community (Structural) Fire Response

Defined in simple terms, community fire protection involves the suppression of structure fires and the protection of structures and other community resources from wildfire. Community fire protection response, typically the responsibility of the local fire agencies and companies, is most often described in terms of *response time*, which is the time that it takes for a fire department to arrive at the incident from the time that a call is made to the 911 dispatcher.

When a fire involves a structure or is determined to be a threat to a community, the local fire-protection organization responsible (based on the location of the fire) and their automatic-aid partners will be dispatched. As needed, additional resource orders are made at the discretion of the Incident Commander (usually the local agency fire chief). CAL FIRE is considered to be a local agency in the case of CSA No. 4 (the area between Orick and Trinidad); an area for which there is an agreement with the County to provide year-round structural fire protection.

Even in areas of the County for which there is no agreement, CAL FIRE will aid in community fire protection if their assistance is needed. Their capability to assist may vary, depending on the time of year and availability of resources. They are most likely to respond to such incidents if there is a significant threat to wildlands in the SRA.

Medical Response

Fire-protection organizations in Humboldt County have a vital and growing involvement in medical emergency response. Because they are dispersed so widely throughout the county, local fire stations are resources from which medical aid can be dispatched with relatively low response times. Much of the time, local firefighters are the first on the scene of medical emergencies and provide *Basic Life Support* (BLS) until an *Advance Life Support* (ALS) ambulance arrives. Because of geographic distances and limited resources, the wait for advanced life support can be significant. This is particularly true for the more remote areas of Humboldt County.

The medical emergency services provided by fire protection organizations are provided under the authority of the North Coast Emergency Medical Services Authority (North Coast EMS). North Coast EMS is a Joint Powers Authority created to develop a regional Emergency Medical Services (EMS) system. North Coast EMS coordinates the EMS system in order to reduce the occurrence of death and disability on the North Coast.

Generally, when an emergency medical dispatch is requested, the closest local fire departments are called in, as are the local ambulance services. Under the agreement with the County of Humboldt, the CAL FIRE station in Trinidad responds to all medical-aid calls within CSA No. 4, just as a local agency would. CAL FIRE also routinely responds to medical aid calls in rural areas during fire season, under the closest resource concept. CAL FIRE has both mutual aid and automatic aid agreements with local agencies to respond to fires and medical aids jointly

and has been tasked by the North Coast EMS to coordinate helicopter responses for medical aids in Humboldt County.

Hazardous Materials Emergency Response

The resources necessary to manage a hazardous materials incident depend on the severity and location of the incident and the type of hazardous materials involved. If there is an accident involving hazardous materials on any roadway in the county, including highways and country roads, the CHP will assume incident command. If an incident occurs on a roadway other than a state highway within a city, the incident command responsibility will fall to city police, with support from the local fire department. If the accident does not occur on a road, its management will be within the jurisdictional responsibility of the County (most likely the Sheriff's Department).

If the materials involved are moderately hazardous and the accident is small scale, then the law enforcement command agency is adequately equipped to manage the situation with the assistance of local fire departments. However, if the incident involves an extremely toxic substance, then a specialized Hazardous Materials Response Team will be called in to assist. Humboldt Bay Fire[7] provides the county with the services of a highly trained Hazardous Materials Response Team to manage particularly complicated situations.

Large-Scale Emergency Response

The County's Office of Emergency Services (OES)[8] is responsible for coordinating emergency response planning for Humboldt County. Additionally, in the advent of a large-scale incident for which a local emergency is declared, OES will assist the Sheriff (the Director of Emergency Services for the County) in controlling and directing the response of emergency organizations. In response to a large-scale emergency such as an earthquake, flood, or tsunami, fire protection organizations and agencies will be dispatched as needed.

II.3.3. Fire Protection Level of Service

Level of Service, for the purposes of this Plan, is defined as the ability to provide, on a countywide basis, adequate and appropriate level of emergency service–that is, a level of service that is commensurate with the community's risks and the public safety responsibilities of the local fire agency/organization. Due to the highly diverse range of community characteristics and emergency service needs throughout Humboldt County, each fire service provider strives to develop an emergency response and deployment system that reflects its constituents' expectations, community needs, and local risks, while staying within the organization's revenue and support constraints. The following sections describe the level of service provided by each fire protection agency and organization in Humboldt County for all of the identified fire and emergency response services discussed above.

Community Fire Protection Level of Service

The following section describes the provision of local community fire protection services within the County; those services that are provided on a year-round basis by local fire departments and companies. "Year-round" service is distinct from the seasonal wildland fire protection services provided by CAL FIRE. During fire season, CAL FIRE will assist with community fire protection and other emergency services on an "as-available" basis. Figure II.3-3

[7] Humboldt Bay Fire represents the operational consolidation of the City of Eureka Fire Department and Humboldt #1 Fire Protection District.

[8] County of Humboldt, Office of Emergency Services (OES). (2003). *OES Home.* Retrieved December 20, 2012, from www.co.humboldt.ca.us/sheriff/oes/default.asp?page=oes

below provides a geographic illustration of where and what type of local fire protection is provided throughout the County.

The map in Figure II.3-3 tells a story about how local fire protection is provided over the landscape. The majority of local fire service providers in Humboldt County are associated with a special district. Special districts providing fire protection services are identified in the map legend as "District." These districts were formed to provide services within a specific jurisdictional boundary and are supported by revenue from a combination of taxes, fees, and fundraising. Many of these jurisdictional boundaries were created as far back as the 1930's. Since that time, neighborhoods, scattered subdivisions, and rural residential development have emerged outside of district boundaries. This newer development requires year-round fire protection and emergency services, which it receives in a variety of ways.

Some areas outside the boundaries of an established district receive fire protection from district resources responding outside of their jurisdictional areas. This type of service is identified in the map legend, in Figure II.3-3 as "Out of District" and is often referred to as "*goodwill service*." District fire departments provide service to these areas even though they are under no obligation to do so and receive no compensation for their service, other than donations. This practice can put a strain on already limited resources. Furthermore, property owners within the district may question why the services funded through their taxes are benefiting out of district residents, particularly if they pay a special tax or benefit assessment specifically for fire protection.

Several districts in Humboldt County are considering the possibility of expanding their boundaries to encompass their out of district response areas to which they regularly provide service. Preliminary studies and deliberations are underway to evaluate the possibility of *annexing*[9] these areas. The annexation process is administered by Humboldt Local Agency Formation Commission (LAFCO)[10]. The districts that are exploring their annexation options are: the Ferndale, Garberville, Petrolia, Redway, Rio Dell, and Telegraph Ridge FPDs and the Fieldbrook CSD. Kneeland and Blue Lake FPDs are just beginning to explore the possibility of annexing additional territory into their respective districts.

Many areas outside the boundaries of an established district receive fire protection from a fire company that is not affiliated with a district at all. These fire companies receive no tax revenue and for that reason are identified on the map legend, in Figure II.3-3, as "Non-Tax'. The survival of these fire companies depends on revenue generated from community donations, fundraisers, and grants. Some communities are more supportive of their local fire companies than others and support can fluctuate dramatically depending on local economic conditions. Since the publication of the 2006 MFPP, the Maple Creek Fire Company was forced to close its doors as the cost of providing fire service outstripped available funds. Consequently, the level of service in that community has been significantly reduced and a strain has been placed on the neighboring fire departments of Kneeland and Blue Lake to fill the service gap.

Conversely, two fire companies recently received approval from LAFCO and the registered voters in their service area to form official FPDs. The Briceland and Bridgeville FPDs are the newest fire districts in the state of California[11]. The property owners will now provide some level of sustainable funding through the annual payment of a special tax to support these two districts into the future.

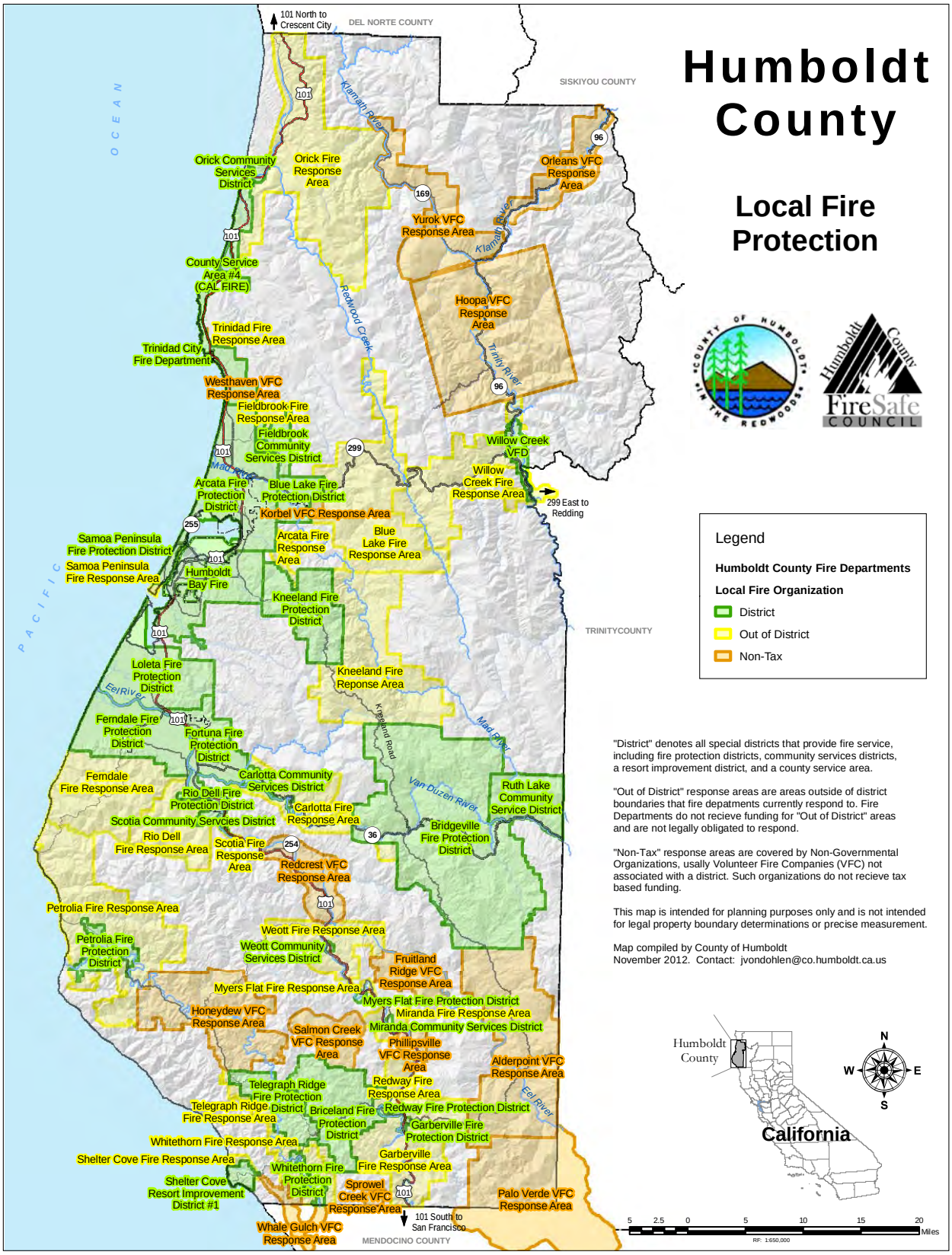
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[9] *Annexing* is officially bringing the areas into the jurisdictional boundary of the district.

[10] Humboldt Local Agency Formation Commission (LAFCO). (n.d.). *Annexation.* Retrieved December 20, 2012, from http://www.humboldtlafco.org/annexation

[11] These districts were officially formed on September 26, 2012.

Figure II.3-3. Local Fire Protection



Organization, Operation, and Deployment

Even with the challenges of sustaining service and coordinating such a variety of different service types, Humboldt County is blessed with a formidable network of local fire and emergency responders. The total number of firefighters associated with local service providers in Humboldt County is 743; of this total number of firefighters, 657 are volunteers and 90 are paid (or career). The average number of firefighters (volunteer and career) per department is approximately 16. The department with the largest number of firefighters is Humboldt Bay (an operational consolidation of Humboldt #1 and Eureka) with 83 members. The departments with the fewest number of firefighters are Phillipsville and Myers Flat, each having 3 firefighters. These numbers are derived from the information provided in Figure II.3-2 in the previous section.

Although improvements have been made since the publication of the 2006 MFPP in the ability of local fire protection organizations' to efficiently, effectively, and safely deploy fire protection resources, these organizations experience a high degree of variability in their training levels, the amount and quality of equipment they possess, and the number of firefighting personnel at their disposal. These differences make it difficult to identify level of service standards that are realistically achievable for all fire service providers. Efforts to address this issue are being made and standards are slowly being developed with consideration for modifying levels of service expectations according to area type; e.g. rural, suburban, or urban.

Many local fire departments are faced with a myriad of challenges having to do with the high cost of insurance and workmen's compensation (although support from the County has greatly reduced the cost of workers compensation), a lack of capital for the replacement of safety equipment, barriers to seamless coordination and communication, and access to appropriate level of training. In addition, some local firefighting personnel have expressed frustration with perceived flaws in the current dispatching system. They appreciate the service but believe that because of misinformation and errors in judgment, the local departments are not always appropriately dispatched. Problems in this area may also be attributed to undefined boundaries and changes in local fire department management.

The Humboldt County Fire Chiefs' Association (Fire Chiefs) is a key organization that works to improve the level of service throughout the county through increased coordination, communication, standardization, and support. The Fire Chiefs meets monthly at various locations throughout the county and provides a venue for sharing information about training, prevention, standards, legislation grant writing, and new initiatives and innovations. The group receives a regular report from fire instructors/training and fire prevention officers, fire/arson investigation, Cal EMA, CAL FIRE, County OES, North Coast EMS, the Humboldt County Fire Safe Council (HCFSC), and others as available. These meetings are also a venue for special presentations on specific topics and for venders to provide information about their products.

The Fire Chiefs is organized with several branches and affiliations, including: the Southern Humboldt Fire Chiefs, the Eel River Valley Fire Chiefs, Humboldt Bay Area Fire Chiefs, Fire Instructors/Training Officers, Fire Prevention Officers, Fire/Arson Investigation Unit, Hazardous Materials Response Team, Humboldt County Fire Radio Dispatch Coop, Humboldt Regional Occupational Program (HROP)[12], and College of the Redwoods (CR)[13]. "The Monitor" is a

[12] HROP provides the Volunteer Firefighter Recruitment Academy and Wildland Certificates, and acts as Fire Science Coordinator. For more information, see: Humboldt County Fire Services Training. (n.d.). *Programs.* Retrieved December 20, 2012, from http://www.humboldt.k12.ca.us/sps/wfp/hrop/fire_services/programs.php

[13] CR provides the Firefighter 1 Academy, an AS Degree Program, Certified Fire Officer Program, and Wildland Certificates and a Fire Technology Coordinator. For more information, see: College of the Redwoods. (2010). *Fire Technology*. Retrieved from www.redwoods.edu/departments/fire/.

monthly publication providing a message from the President of the Fire Chiefs and meeting notes from many of the above groups. The Monitor is edited and distributed by a staff member of the Eureka Fire Department. General support for the Fire Chiefs is provided by administrative staff from Humboldt Bay Fire, and Arcata Fire District. Logistical support is provided by Chief Officers from Humboldt Bay Fire, Arcata Fire District, Blue Lake Fire District, Fortuna Fire District, and CAL FIRE.

The Fire Chiefs coordinate and sustain several programs and innovations that work together to support an ever-increasing level of fire service in Humboldt County. An example is the production of an Annual Report which is presented to the Humboldt County BOS and posted on the HCFSC webpage[14]. The report includes a letter from the President of the Fire Chiefs summarizing the year's activities, challenges, and accomplishments, as well as a page for each fire department that includes a description and summary of the year's number of incident responses, volunteer hours, and personnel, and a tabulation of all volunteer hours contributed by all organizations for incident response, training, maintenance, and fund raising. This report is a valuable tool for increasing awareness among elected officials and the public about who provides local community fire protection, what services they provide, and the level of volunteer effort needed to sustain the service. The report can also be used as a directory.

Another initiative of the Fire Chiefs is to ensure that each local fire service provider uses a standardized numbering system to identify each of their units of apparatus. The assigned number identifies what region of the County the unit comes from, what department it belongs to, and what type of unit it is. For instance, just by looking at the number it can be determined that the unit was a medical rescue vehicle as apposed to a water-tender and that it hails from the Willow Creek Volunteer Fire Department in the Northern Humboldt Region. This clear identification of resources facilitates accurate dispatching and efficient operational control of resources on scene, and eliminates the possibility of duplicate engine numbers.

To provide quick and adequate response to fires, the Fire Chiefs developed, approved, and maintain a countywide mutual aid agreement. The agreement is in the form of a memorandum of understanding (MOU) made and entered into by and between all local fire service providers in the County as well as CAL FIRE. The MOU states that the equipment, facilities, and trained personnel of each fire department are available to the other participants in the agreement on an as requested basis. The MOU allows for a quick, decisive dispatch of resources and lays out expectations and responsibilities for both the requesting entity and the entity providing the mutual aid. Departments that are located near either National Forest or Recreation Area lands have mutual aid agreements with the USFS and BLM.

The Fire Chiefs is in the process of developing the Humboldt County Incident Support Team. This team will help standardize and increase the efficiency of incident response and management countywide. It is intended to support local fire service providers as needed and only when requested. The team, composed of individuals from multiple agencies, is being trained in the *Incident Command System* and roles are being assigned based on the necessary overhead positions. This team will be available to any fire service organization to call upon during a large emergency to assist with communication, coordination, and decision making.

Technical Rescue is a needed service in Humboldt County that demands a capability beyond that of any one fire department and is provided as a special operation through the joint efforts of several different departments. There are three technical rescue teams in Humboldt County: the Southern Humboldt Technical Rescue Team, the Eel River Valley Technical Resource Team, and the Humboldt Bay Fire and Arcata Fire Department Urban Search and Rescue (USAR) Type II Team. The Southern Humboldt Technical Rescue Team specializes in rope, water, and wilderness

[14] County of Humboldt, Natural Resources Planning. (2012). *Humboldt County Fire Safe Council.* Retrieved from www.co.humboldt.ca.us/natural-resources/fire_safe_council/fireserviceannualreport.aspx

rescue and responds through an auto aid agreement to all over-the-bank and water rescues in Southern Humboldt. This team is made up of members from seven different Southern Humboldt fire departments. The Eel River Valley Technical Rescue Team is a relatively new team and trains in low angle rope rescue, hazardous materials operations level, confined space rescue, swift water rescue, and rescue systems. This team is made up of members from the Bridgeville, Carlotta, Ferndale, Fortuna, Loleta, Rio Dell, and Scotia fire departments. The participating departments in the Humboldt Bay USAR Team are in the process of training eight personnel apiece (for a total of 24 personnel between the three agencies) in advanced rescue techniques in order to safely and efficiently use the equipment in a wide variety of disaster settings.

Initial Response and Dispatching

Based on a combination of information sources, there is ever-increasing pressure on fire protection organizations and agencies to expand department operations to effectively meet service demands. Because of limitations in the current incident reporting methods and insufficient data, it is difficult to provide an exact number for the percent increase in emergency calls for the entire County. However, there is consensus among fire fighting personnel that demand is increasing.

Fire protection organizations have, thus far, managed to respond to the demand with excellent service. However, if the annual rate of calls for service continues to increase, options for expanding service capabilities will need to be explored. Dispatch providers have indicated that if demand for services continues to increase they will require additional funding and staffing, expanded facilities, and, in some cases, an increased financial contribution from users.

As an example of the increased demand for emergency services, Figure II.3-4 displays a sample of incident reporting that is available from the FICC. The FICC accounts for a large potion of the emergency calls countywide, but not all of them. Dispatch records identify a rise in incident calls over the last 5 years. From 2007 to 2011, an approximate 22% increase in fire and medical emergency calls has been documented (see Figure II.3-4).

Figure II.3-4. Fortuna Interagency Command Center Recorded Activity for Fire and Medical Aid[15]

	Year				
Incident Type	**2007**	**2008**	**2009**	**2010**	**2011**
Public Assist[16]	1595	1826	1088	553	720
Medical Aid	3477	4726	4767	4749	5040
FMS-Hazmat[17]	59	181	155	187	140
Structure Fire	102	178	158	132	164
Fire Other	368	677	786	734	913
Wildland Fire	199	407	239	176	118
Referral to other agency	73	52	183	138	68
Total	**5,873**	**8,047**	**7,376**	**6,669**	**7.163**
Percent Change		+37%	-8%	-9%	+7%
Average Increase per year	+7%				
Percent Increase 2007 to 2011	+22%				

Several local fire departments have an added enhancement that assists their dispatch and response and likely improves their level of service. The Arcata, Humboldt Bay (Humboldt #1 and Eureka Fire), Blue Lake, Fortuna, Rio Dell fire departments have contracted with a company named Iron Compass in order to maintain a mapping program and database that is linked to computers on-board duty officer vehicles and some fire engines. These on-board computers assist firefighters in their efforts to locate an incident and can be updated as they learn new details about their response areas, such as access codes to gates and unrated bridges. Participating departments use this program to build and access pre-fire planning information such as new structure locations, special hazards, and special information including fire department sprinkler connection information. Humboldt County Office of Emergency Services (OES) secured Homeland Security funding to purchase the necessary equipment, hardware, and software. As funding becomes available, other fire departments will participate in this program.

Insurance Services Office (ISO) Public Protection Classification Program

The Insurance Services Office (ISO) establishes fire insurance ratings for Humboldt County communities, as it does for all other communities in California. The ISO classification and rating system serves to provide an additional analysis tool in evaluating fire protection capability that exists within Humboldt County. A brief background and description of ISO and the classification/rating system is necessary to fully appreciate the value of their fire department evaluation process, and the implications of this classification in determining fire insurance rates for communities and rural areas within Humboldt County.

The ISO is the insurance industry standard source for information, products, and services related to property and liability risk rating. ISO provides statistical, actuarial underwriting and claims information and analyses for insurers, insurance agents and brokers, risk managers, fire departments, and other government agencies throughout the United States. One of ISO's better known services is to evaluate the fire suppression delivery systems of fire departments and districts. The result of those reviews is an individual Public Protection Classification (PPC) rating number assigned to the community that the respective fire department protects. The ISO then

[15] CAL FIRE, Emergency Command Center. (2012). Fortuna Interagency Command Center, Fortuna, CA.

[16] Public Assist means assisting the public in a non-emergency manor.

[17] FMS-Hazmat means Hazardous Materials, Fire Menace Standby.

distributes these ratings to fire insurance companies and carriers. Insurance companies use the PPC information to establish premiums for fire insurance within the community that was rated – generally offering lower premiums to communities with better fire protection.

It is important to recognize that insurance companies, and not ISO, establish the premiums charged to policyholders. Additionally, not all insurance companies use the ISO PPC rating. Some companies make their own analyses based on their record of historical loss data rather than on fire protection capabilities or, alternatively, create their own evaluation process for fire departments.

ISO Fire Suppression Rating Schedule

The Fire Suppression Rating Schedule is used by ISO to grade the response capabilities within a community. The schedule is the tool used to develop a numerical PPC grading for communities. The ISO has measured the major elements of most of Humboldt County's community fire suppression systems and subsequently developed a numerical PPC grading. The ISO grading audit for Humboldt County communities measured their compliance with a national minimum standard in specific "capability" areas. Examples of evaluation criteria include:

- Can the emergency caller find the fire department number in the phone book?
- Does the water system match the needed fire flow requirements of residential and commercial buildings in the community?
- Is the fire department capable of suppressing the types and magnitudes of fires that are likely to occur in the community?
- Are the fire department's ladders long enough to reach the buildings that they protect?

Specific ISO PPC rating criteria and grading weight percentages are further defined as follows:[18]

Fire Departments/Districts (50%)

Fifty percent of the overall grading is based on the number of engine companies and the amount of water a community needs to fight a fire. ISO personnel review the distribution of fire companies throughout the area. The ISO ensures that the fire department conducts regular testing of its pumps, and inventories each engine company's nozzles, hoses, breathing apparatus, and other equipment. ISO personnel also review individual fire company records to determine the type and extent of training provided to fire company personnel, the volunteer-to-staff (paid) ratio, the number of people who participate in training, firefighter response to emergencies, and the maintenance and testing of the fire department's equipment and apparatus. In order to receive a rating at all, a department must have at least four members available to respond to a structure fire.

Community Water Supply (40%)

Forty percent of the grading is based on the community's water supply. This part of the survey focuses on whether the community has sufficient water supply for fire suppression beyond daily maximum consumption. Sufficient water supply is defined as 250 gallons per minute for a two-hour duration, within five minutes of the arrival of the first firefighting apparatus. ISO surveys all components of the water supply system, including pumps, storage, and filtration. ISO rating personnel also observe fire-flow tests at representative locations in the community to determine the rate of flow the water mains provide. The distribution of fire hydrants that are within 1,000 feet from structural locations is also recorded.

Fire Alarms (10%)

[18] For more information on PPC rating criteria and procedures, see: Insurance Service Office (ISO). (2012). *Public Protection Classification (PPC™) Service*. Retrieved from http://www.iso.com/Products/Public-Protection-Classification-Service/Public-Protection-Classification-PPC-Service.html

Ten percent of the overall grading is based on how well the fire department receives and dispatches fire alarms. ISO field representatives evaluate: the communications center and the number of 911 operators at the center; the telephone service, including the number of phone lines that come into the center; how emergency numbers are listed in the telephone book; and how the center notifies firefighters about the location of the emergency.

ISO Public Protection Classification Rating

Based on the results of the ISO grading audit described above, a community is assigned a protection-class rating. The ratings are presented in a rating class structure which ranges from 1 to 10. Class 1 is the highest rating, representing excellent fire protection and Class 10 is the lowest, meaning the community's fire department did not meet the minimum requirements of the Fire Suppression Rating Schedule and is not recognized by ISO. A Class 9 is the lowest rating that a community can have with a recognized fire department and means that the department did not meet the criteria for adequate water supply.

ISO PPC Rating's Direct Relationship to Insurance Rates

An ISO Class 1 rating means that the community scores 90% or better on meeting the ISO national standards in communications, fire department capability and water supply; a Class 1 community pays the lowest possible fire insurance rates. A Class 5 community pays moderate fire insurance rates and meets 50 to 60% of the national standards. A Class 9 community scores 10 to 20% and receives the lowest grade given for any form of recognized fire protection, and pays high fire insurance rates.

A Class 10 community scores 1% or has not been classified by ISO. A Class 10 community may pay extremely high property insurance premium, and, under many circumstances, may not be eligible to receive insurance at all. It must be noted that in California, as of June 1st, 2003, if a residential property is over five road miles from a credible responding fire station it is automatically rated as a Class 10. This is the case no matter how much water is available to fight fire. Commercial insurance premiums will remain unaffected by this change as it was always necessary for commercial risks to be located under five miles from a fire station to receive a classification lower than a 10.

Many communities in Humboldt County last had their fire departments graded by ISO in the 1980s and 1990s when residential properties could receive a rating lower than a 10, up to 10 miles away from a recognized fire station. When these communities go through the reclassification process with ISO, many of their residential properties may change from an ISO PPC rating 8 or 9 to a 10, possibly resulting in higher residential property insurance premiums. Figure II.3-5 contains all of the rating points range for each possible rating class.

Figure II.3-5. ISO PPC Rating Points Range for Each Rating Class

% Credit	Class	% Credit	Class
90.0 – 100	1	40.0 - 49.9	6
80.0 – 89.9	2	30.0 – 39.9	7
70.0 – 79.9	3	20.0 – 29.9	8
60.0 – 69.9	4	10.0 - 19.9	9
50.0 – 59.9	5	0.1 - 9.9	10 (No credible fire protection)

The following table illustrates the impact that different ISO PPC ratings have on an estimated insurance premium for an average Humboldt County home. There are likely other factors that have an influence on homeowners insurance but this example indicates that there is a direct financial benefit to improving the ISO PPC ratings of local fire departments.

Figure II.3-6. Potential Insurance Savings in Humboldt County with ISO PPC Ratings Change[19]

Value of Home = $200,000		
ISO PPC Rating	**Estimated Annual Insurance**	**Incremental Savings Per Rating Decrease**
10	$1,696 (if insurance can be obtained at all)	
9	$1,367	19%
8	$1,076	21%
7	$952	12%
1 - 6	$827	13%

Current ISO PPC Ratings in Humboldt County

Most of the fire departments/districts and some volunteer fire companies have been evaluated by ISO and their associated communities assigned a PPC rating. The ISO Community Mitigation and Public Protection branch based out of Chicago provided a list of ratings associated with each classified fire department in Humboldt County. Many of the volunteer fire companies, CSA No. 4, and one fire protection district have either not been classified or were determined not to have met the minimum requirements of the Fire Suppression Rating Schedule. These unrecognized departments automatically receive a Class 10. The ISO PPC ratings for all Humboldt County fire protection organizations are listed in Figure II.3-7.

The diversity of fire protection capability within Humboldt County is reflected in a wide diversity of ISO PPC ratings, which range from a Class 3 rating (City of Eureka) to a Class 10 rating. It appears that requesting a new ISO evaluation may be productive for some Humboldt County districts and/or community areas that have a split ISO rating (e.g., 5/9), a rural Class 9 rating, or no rating at all. For example, if a suburban/semi-rural risk is currently assigned to protection Class 9, or dual protection classes exists (e.g. 4/9), and the risk (e.g., house) meets all the criteria listed below, the risk may be eligible for a class reduction to a PPC class 8:

- Risk (home) is within five road miles of a responding fire department.
- Risk is visible by at least four other homes;
- Paved public roads lead to the risk;

[19]Gerald R. Becker Insurance (Ferndale, CA), personal communication, September 4, 2012.

- Risk is accessible to fire equipment year round;
- Responding fire department has a tanker truck carrying at least 2,000 gallons of water (even if this capability is only available through the timely utilization of automatic aid and mutual aid);
- Risk is less than 40 years old; and
- Risk does not have a wood burner present (for example a wood stove or furnace).

It is difficult to make generalizations about how changes in PPC ratings will reduce or increase individual insurance policies in Humboldt County. However, ISO does provide some guidelines for how to understand the possible benefits of improved ratings. For example, ISO states that, based on their experience, a change in PPC rating could affect the price or availability of personal and commercial insurance coverage and, "assuming all other factors are equal, the price of property insurance in a community with a good PPC is lower than in a community with a poor PPC."[20] **To gain the benefits of a good PPC rating, ISO emphasizes the importance of community support for local fire departments because "a community's investment in fire mitigation is a proven and reliable predicator of future fire losses."[21]**

Figure II.3-7. Current Humboldt County Fire Protection Organization ISO PPC Ratings[22]

Fire Protection Agency or Organization	ISO PPC Rating	Effective Date
Arcata Fire Protection District	4/8B	12/01/2005
Blue Lake Fire Protection District	5/8B	02/01/2005
Briceland Fire Protection District		
Bridgeville Fire Protection District		
Carlotta Community Services District	8B	07/01/2004
Eureka City Fire Department	3/9	11/01/1998
Fairhaven Fire Protection District (now known as Samoa Peninsula Fire Protection District)	5/9	01/01/1984
Ferndale Fire Protection District	5/8B	02/01/2003
Fieldbrook Community Services District	5/8B	02/01/05
Fortuna Fire Protection District	4/7	03/01/05
Fruitland Volunteer Fire Company	9/9	12/01/99
Garberville Fire Protection District	6/9	01/01/1984
Hoopa Fire Department	7/9	02/01/1987
Humboldt #1 Fire Protection District	5/9	08/01/2005
Kneeland Fire Protection District	10	02/01/1990
Loleta Fire Protection District	6/8B	02/01/2005
Miranda Community Services District	7/9	05/01/1998
Myers Flat Fire Protection District	8/9	02/01/1996
Orick Community Services District	7/9	02/01/1996
Orleans Volunteer Fire Company	5/9	02/01/1989
Petrolia Fire Protection District	9/10	02/01/1997

[20] ISO, Mitigation Online. (2012). *How does PPC Information Affect Individual Insurance Policies?* Retrieved from http://www.isomitigation.com/ppc/0000/ppc0006.html.

[21] ISO, Mitigation Online. (2012). *Benefits of the PPC™ Program for Communities*. Retrieved from www.isomitigation.com/ppc/0000/ppc0005.html.

[22] List of ISO ratings produced by personal communications with local fire departments, and: ISO Community Mitigation and Public Protection. (2005). *CMC Manual Plus Community Report*. Chicago, IL.; and: Humboldt County Fire Chiefs Association. (2012). 2012 Local Fire Protection Survey..

Fire Protection Agency or Organization	ISO PPC Rating	Effective Date
Phillipsville Volunteer Fire Company	10	05/01/1999
Redway Fire Protection District	5/9	12/01/2003
Rio Dell Fire Protection District	7/9	01/01/1984
Scotia Volunteer Fire Company	4/9	02/01/1997
Resort Improvement District No. 1 (aka Shelter Cove Fire Dept.)	6	08/01/1994
Trinidad City Fire Department	6/9	12/01/2003
Weott Community Services District	8/9	02/01/1997
Whitethorn Fire Protection District	9	12/03/2003
Willow Creek Fire Protection District	5/9	8/01/2005
Fire Protection Organizations not recognized by ISO	ISO PPC Rating	
Alderpoint Fire Company		
Westhaven Volunteer Fire Company	10	05/01/2005
Yurok Volunteer Fire Company	10	
Telegraph Ridge Fire Protection District	10	
Sprowel Creek Volunteer Fire Company	10	
Salmon Creek Volunteer Fire Company	10	
Redcrest Volunteer Fire Company	10	
Prosper Ridge Volunteer Fire Company	10	
Palo Verde Volunteer Fire Company	10	
Korbel Volunteer Fire Brigade	10	
County Service Area #4 District	10	05/01/2005
Honeydew Volunteer Fire Company	10	

Wildland Fire Protection Level of Service

While vegetation fires constitute a small percentage of the overall demand for emergency services, demand placed on local, state, and federal firefighting resources by wildfires can be substantially greater than most of the other types of calls combined. The Canoe and Honeydew Fires of 2003, which cost approximately $28,500,000 dollars and lasted 42 days, and the Humboldt Lighting Complex Fires of 2008, which involved approximately 50 separate fires, are perfect examples of how wildfires can require a much greater response than a medical aid or structure fire. Wildfires can last for several days or even months, and can cost tens of millions of dollars. Wildfires frequently require aircraft of various types as well as fire engines, hand crews, and other specialized equipment. Acquiring these precious resources in an organized and timely manner involves coordination with multiple agencies around the state and country.

Local Fire Service

The local fire service in Humboldt County, although primarily responsible for community fire protection, has a key role in wildfire management. Local firefighters train and are equipped for wildfire response and are often called upon to assist CAL FIRE during wildfire events. Local firefighting resources respond from over 50 locations throughout the county, so they are well situated to supplement CAL FIRE resources, which can have longer *response times*. Local firefighters are frequently the first on the scene and are able to initiate suppression actions until CAL FIRE arrives, thus keeping the fires to a manageable size. Many local fire departments and companies also provide station coverage for CAL FIRE when state resources are called away to wildfires outside of Humboldt County. During station coverage assignments, local firefighters must fill the wildfire management role of CAL FIRE.

Humboldt County also boasts a local government Type 3 Strike Team. CAL FIRE can hire this local strike team to supplement their resources during wildfire events both inside and outside of Humboldt County. Local fire department *apparatuses* have also been rented by the state and operated by CAL FIRE personnel. There are direct benefits to the local fire service from this arrangement in the form of money earned by the participating fire department and individual firefighters. This money supports local fire service and circulates back into the local economy. There is also a more indirect benefit to local firefighters, many of whom are volunteers, in gaining valuable wildfire management experience. This experience will benefit Humboldt County communities by developing more confident, capable local firefighters. Firefighters learn about wildfire management strategies, radio communication during a wildfire event, working together, the importance of training, and the realistic physical demands and expectations when working with professional agencies such as CAL FIRE and the USFS. All of this experience will increase the ability of local firefighters to quickly and efficiently pull resources together, should a large wildfire event take place in Humboldt County.

CAL FIRE

CAL FIRE maintains a significant presence in Humboldt County in both fire protection and resource management. The CAL-FIRE Humboldt-Del Norte Unit (CAL FIRE-HUU) Administrative Headquarters is located in Fortuna and houses the FICC dispatch center. CAL FIRE-HUU staffs a station in Trinidad year-round with firefighters under an Amador agreement with the County of Humboldt. CAL FIRE stations in Fortuna, Weott, and Garberville are staffed at varying levels throughout the year. Staffing levels at these three stations are adequate for emergency response most of the year. Additionally, the following CAL FIRE stations are staffed only during fire season: Elk Camp (in Redwood National Park), Bridgeville, Alderpoint, Mattole, and Thorn.

CAL FIRE also operates three Conservation Camps operated jointly with the Department of Corrections (Alder Camp in Del Norte County along with Eel River Camp and High Rock Camp in Humboldt County), where inmates serve out their sentences performing firefighting and conservation related tasks. Each camp provides five hand crews for firefighting purposes, and each crew is made up of up to 17 firefighters and a captain. These crews are an all-risk department resource used both within Humboldt County and on a statewide basis year-round. These camp assets are maintained fire/emergency ready year-round. During non-emergency response, these crews are deployed to work on fuel reduction projects and projects requested by other public agencies throughout the year. These crews are trained in emergency responses including, but not limited to, fire, flood, earthquake, medical, and vehicle accidents. CAL FIRE also operates the Rohnerville Air Attack Base, the Kneeland Helitack Base, and one fire lookout (only during times of high fire danger) at Grasshopper Peak. During past fire seasons, CAL FIRE has also operated the Schoolhouse Peak Fire Lookout, located on Redwood National Park lands.

CAL FIRE HUU, including areas outside of Humboldt, maintains 14 frontline engines, with two engines in reserve, two dozers, 15 inmate crews, one helicopter, one air attack, and one air tanker for fire suppression efforts. There are approximately 100 permanent fire suppression personnel, 12 resource management personnel, and six clerical personnel to support these efforts. Additionally, the Unit hires approximately 90 limited-term and seasonal personnel to supplement permanent staff during the fire season.

All Unit aircraft provide rapid initial attack and are especially valuable in the County's remote areas where steep terrain and narrow, winding roads greatly increase ground response times. In such situations, aircraft are often at scene and applying water or retardant before engines or bulldozers arrive, cooling the fire and giving ground resources the ability to achieve initial attack success. Aircraft also provide "eyes in the sky" for those on the ground, noting spot fires and giving helpful direction from their vantage point.

The CAL FIRE-HUU protects 1,904,745 acres of SRA, and 1,962,817 acres of DPA[23] CAL FIRE provides DPA wildland fire protection for the Yurok Reservation through an agreement with the Bureau of Indian Affairs (BIA). CAL FIRE also has an agreement with BLM and the USFS to provide DPA protection to specified lands under their management. Figure II.3-8 presents these DPA protection areas. Additionally, certain SRAs are within the USFS DPA, which requires them to provide fire protection under an agreement with CAL FIRE.

The California Fire Plan states: "fire protection forces in California must have sufficient depth to respond to large, multiple wildfires and still prevent other small fires from becoming large damaging fires." CAL FIRE-HUU is part of a larger statewide system and is consequently called upon to respond to fire incidents throughout the state. However, CAL FIRE does keep minimum level of staffing in Humboldt and will hire local resources to fill in as necessary.

During the declared fire season, CAL FIRE engines are staffed 24 hours a day. The objective for CAL FIRE is to successfully contain 95 percent of wildfires within the SRA and DPA at 10 acres or less. In addition to fire engines, CAL FIRE will respond with fire crews, bulldozers, air tankers, helicopters, air tactical supervisors, and battalion chiefs as a component of the initial dispatch. The standard dispatch for any given incident is based upon the current fire behavior indices, as developed through the *Unit Fire Weather Plan*.

Dispatch levels are set several times per day. An early day wildland fire dispatch will usually be at a Low to Medium dispatch level and is limited to two engines. During the heat of the day, the dispatch level will increase to High, with four fire engines, two bulldozers, two crews, a helicopter, two air tankers, air tactical supervisor, and two battalion chiefs. The dispatch can be modified by the Emergency FICC Officer based upon the initial report though the 911 system, lookout reports, or other information.

Six Rivers National Forest

The SRNF provides wildland fire suppression resources that respond to a variety of emergency incidents, the primary mission being wildfire. Staffing levels are based on the level of fire danger, with the greatest staffing levels during the months of May-October and reduced staffing levels the remainder of the year. During periods of increased fire danger, the SRNF staffs 12 engines, 13 patrol/prevention units, three Type-1 hand crews, one Type-2 *initial attack* hand crew, four *water tenders*, a bulldozer, and four lookouts. The SRNF employs approximately 300 emergency responders who perform a variety of functions in operational and non-operational roles; these include primary firefighters as well as support personnel in areas such as logistics, planning, resource advising, and public information. SRNF is also in agreement with the California Conservation Corps, Fortuna Center to mobilize a Type-2 hand crew staffed with members from both agencies, with a target response time of four hours or less. These are the resources provided from locations throughout the entire SRNF which covers an area larger than the County of Humboldt.

Fire season is not "declared" within the SRNF. The appropriate staffing levels are determined year-round, based on Fire Danger rating and the 90th percentile of when fires have occurred, historically. Suppression modules are fully staffed from approximately May 15 through October 15 and the daily operational period of on-duty fire resources is 9:30 AM to 6:00 PM, 7 days/week. Extended staffing may go into effect according to Fire Danger and *draw-down levels*. The portion of the season in which suppression modules are fully staffed may also be extended according to the severity of fire danger and fire activity that season.

The SRNF is divided into Response Areas, which are areas of land that receive the same responding forces in an initial dispatch. The predetermined responses for these areas are called "run cards" or the dispatch strategy. In Humboldt County, there are 20 SRNF response areas.

[23] Figures are for Humboldt and Del Norte Counties combined.

Dispatch levels, which are described as High, Moderate, or Low Response, are set according to actual and predicted fire danger.

The SRNF operates nine Remote Automated Weather Stations (RAWS) and one Manual station. These stations provide hourly data for the four Fire Danger Rating Areas. Fire danger is calculated twice daily. Fire danger is calculated at 1:00 PM using current observations from the weather stations and this determines the "Actual Fire Danger" for the rest of the day; it is then calculated again at 3:30 PM, using the predicted weather forecast for the "Predicted Fire Danger" for the following day (which will be updated again with "Actual" again at 1:00, and so forth). During periods of increased fire danger, dispatch levels are set two times a day: at 9:30 AM from the previous day's Predicted Fire Danger and again at 2:30 PM at that day's Actual Fire Danger.

The SRNF portion of the FICC utilizes an automated computer-aided dispatching (CAD) system. -All firefighting resources are staffed daily using the CAD system, including cooperating agencies. Using the "closest resource concept," cooperating agencies may be requested as an initial response in situations where they are the closest resource to the fire, based on the run card. The initial dispatch may be modified by the 'first on scene' or Incident Commander, or the FICC Commander, according to actual and predicted fire behavior and other local knowledge that may be pertinent to the situation.

Initial attack on wildfires that occur on SRNF lands is an aggressive suppression action, consistent with firefighter and public safety and values to be protected. Suppression tactics may vary from aggressive *direct attack* to efforts designed to limit the wildfire to an identified area, defined by manually or mechanically constructed *fireline*, *topographic breaks*, *natural barriers*, or vegetation breaks. Large fire management on the SRNF is guided by several strategic priorities, which include: availability of fire suppression resources; assets and values threatened; current and predicted weather conditions; availability of air support (helicopters and air tankers); access; fire potential analysis; and other logistical issues.

Under a cooperative agreement, the federal and state agencies have exchanged protection responsibilities in specific areas. For example, fire protection on most FRA public land managed by the BLM, including the King Range National Conservation Area, is the responsibility of CAL FIRE. Additionally, Willow Creek and Orleans are within the protection responsibility of the SRNF for wildfires, even though these communities are in the SRA. Figure II.3-8.State and Federal Fire Protection Map presents these DPA protection areas.

USFS statewide and regional-level cooperative fire agreements are as follows:

- Five Party Agreement with CAL FIRE, USFS, BLM, US Fish and Wildlife Service, and National Park Service (Provides for interagency response to wildfires within the state of California)
- California Fire Assistance Agreement with California OES, CAL FIRE, USFS, BLM and NPS (Cooperative Agreement for acquisition of local government resources by the Resource/ Wildland Fire agencies for assistance on wildfires within California).
- Northwest Area and Oregon Cooperative Fire Agreement
- California Fire Service and Rescue Emergency Mutual Aid Plan
- National Park Service Cooperative Agreement
- California Conservation Corps
- Memorandum of Agreement for the Development of a Collaborative Fuels Treatment Program (USDA, DOI, National Association of State Foresters, and the National Association of Counties)

SRNF forest-wide fire assistance agreements and local operating plans are as follows:

- Hoopa Valley Tribe (Fire Department)

- CAL FIRE-Humboldt Del-Norte Unit
- Redwood National Park
- Bureau of Land Management (Kings Range)
- California Conservation Corps (Fortuna)
- Incident Service Agreement with The Native Service Crew
- Local Operating Plan with Six Rivers NF, Siskiyou NF, and Redwood NP
- Humboldt County (use of Rhonerville airport for landing aircraft involving wildfire suppression activities)
- Memorandum of Understanding Between the Karuk Tribe of California and USDA FS Six Rivers and Klamath National Forests
- Memorandum of Understanding Between the Yurok Tribe and USDA FS Six Rivers National Forest

SRNF agreements with Humboldt County local volunteer fire departments for fire suppression assistance and assistance-by-hire for wildfire incidents are as follows:

- Orleans Volunteer Fire Department
- Willow Creek Volunteer Fire Department
- Hoopa Volunteer Fire Department

Hoopa Wildland Fire Department

The Hoopa Valley Tribe is responsible for providing wildland fire management and fire protection for the Hoopa Reservation. In 1991, the Hoopa Tribe compacted the entire Fire Pre-Suppression and Suppression program from the BIA, meaning that they assumed responsibility and funding from BIA through a contract with the Department of Interior. Throughout the declared fire season, the Hoopa Wildland Fire Department is staffed during the day, seven days per week. The Hoopa Wildland Fire Department normally staffs two engines during fire season. A duty officer and an engine crew are available for call-back within 30-minues during off-duty hours. The objective for the Hoopa Wildland Fire Department is to successfully contain 95 percent of fires within the Hoopa Valley Reservation within the first *burning period* (that part of each 24-hour period when fires spread most rapidly, typically from 10:00 a.m. to sundown). The standard dispatch for any given incident is based upon the current fire behavior indices. Additional flexibility is provided for increased staffing and equipment when extreme *fire weather* is forecast.

Upon arrival of the first unit on scene, command of the incident is established. The incident's potential and the resources needed are evaluated by the Incident Commander. Additional engine crews are ordered as needed through the local dispatch center. If additional resources are needed from other locations, a resource order is processed through the FICC, utilizing the agreement with SRNF.

Redwood National Park

During the declared fire season, Redwood National Park staffs two engines, five days a week from 9:30 AM to 6:00 PM. Fire fighting equipment is maintained at the Wolf Creek Fire Cache or the Hiouchi Fire Station. If the Park is experiencing extreme fire indices, based on readings from two Remote RAWS, the acting Duty Officer will determine if longer staffing hours are needed. It is National Park Service policy to meet or exceed a 95 percent initial attack success target.

Redwood National Park's daily staffing level is based on the Redwood National Park Preparedness Plan. The preparedness plan determines thresholds for Low, Medium, High, Very High, and Extreme fire danger based on daily Energy Release Component (ERC) predictions. The

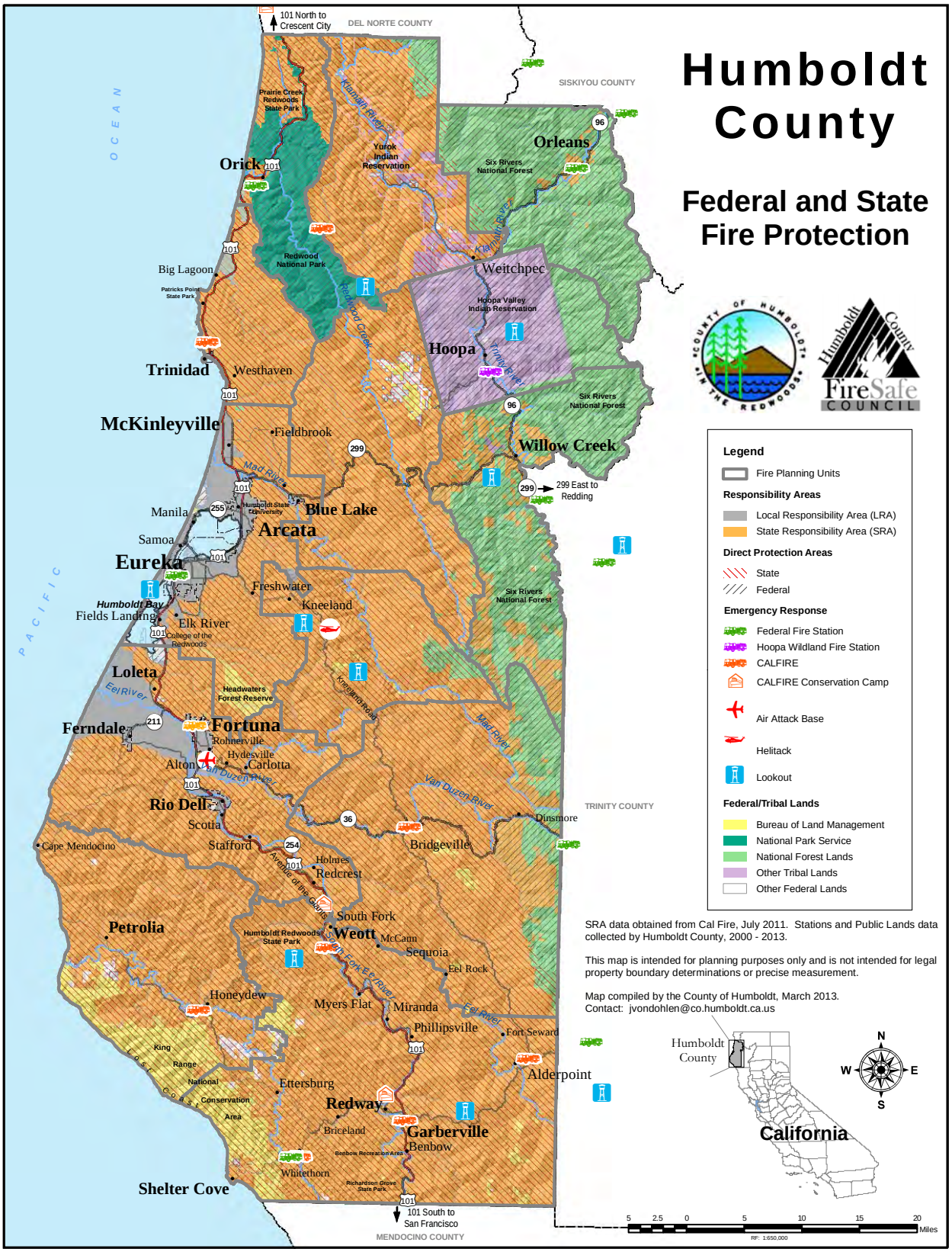
park currently uses RAWS stations located near the extreme north and south ends of the park to determine its daily ERC's.

The standard dispatch for any given incident is determined by the Preparedness Plan. The standard dispatch generally includes one engine module. The Duty Officer will request that additional resources be dispatched through FICC, as fire conditions warrant. During the initial attack, the first unit on scene establishes incident command (IC). The initial attack IC then determines if there is a need for additional resources based on current and expected fire potential and orders the appropriate type and number of resources through the FICC.

Bureau of Land Management

The BLM-Arcata Field Officer administers 126 square miles of public lands in Humboldt County including the Headwaters Reserve, the King Range National Conservation Area, Samoa Dunes Recreation Area, and the Lost Coast Headlands. The CAL FIRE-HUU, through the California Cooperative Fire Protection Agreement, provides wildfire protection for Humboldt County BLM lands. The BLM augments CAL FIRE's initial attack resources during fire season by providing a BLM Type 4 engine and crew at the BLM King Range Project Office site (located between Garberville and Shelter Cove at the Whitethorn Junction.)

Figure II.3-8. State and Federal Fire Protection Map



II.3.4. Fire Protection Support

Fire protection support is the key to successfully and sustainably providing a high level of wildfire response in Humboldt County. It makes it easer for firefighters to do their job when the residents they serve and protect support them. This support can take many forms.

There is always a pressing need for financial support. The fire companies that are not associated with a special district in Humboldt County have no dependable revenue source and spend a considerable amount of their time fundraising. Even the District fire departments that receive revenue from a tax or fee, work hard to raise additional funds to cover expenses. It is very common for local fire service providers to hold large annual fundraisers, small bake sales, and various types of fundraisers. Continued support from their communities for these events and efforts is critical to their survival.

Another way that community members support their local fire service is through commitments of time and energy. Many local fire service providers are often in need of volunteer firefighters and auxiliary members to help with important activities, such as responding to emergencies, fundraising, book keeping, and dispatching. Volunteer firefighters need to be committed to the training, response, and general safety compliance demands of the "job." As noted above, a large majority of the firefighters in Humboldt County are volunteers. Without the dedication of the hundreds of residents who step forward as volunteers, this County would have a significantly reduced level of service.

Firefighters' ability to protect homes safely and effectively is greatly hindered or aided by how property owners prepare their homes and land. An important way that community members can support firefighters is to take personal responsibility for implementing fire safety measures on their properties. Firefighters can protect homes more effectively if they have access to them. Firefighter access can be facilitated by posting address signs, maintaining road surfaces so that they are passable, managing the buildup of vegetation along roads, and ensuring that firefighters can easily get through gates. In many areas throughout Humboldt County, firefighters study their response areas and test the ease of access. These efforts can be greatly abetted through the support of local residents.

Another measure that can be taken by property owners to assist firefighters is to provide adequate firefighting water and pressure. Firefighters in Humboldt County are concerned that many property owners do not have enough available water to help them suppress a structure fire or protect a home from wildfire. They would like residents to keep full water tanks dedicated to firefighting resources near their homes. These tanks must hold at least 2,500 gallons of water and be properly fitted with hardware that is compatible with firefighting hoses and fittings.

Maintaining adequate *defensible space* around structures is important for the protection of firefighters. They need that space as a buffer between them and an oncoming wildfire and if it's not there, they can not safely protect the structure and will be forced to move on. Residents who maintain the vegetation around their homes are not only increasing the chance of structure survival but are also improving firefighter safety.

Another important way that residents can support the efforts of firefighters is to prepare for safe evacuation and to evacuate well in advance of an approaching wildfire. Timely evacuation allows firefighters to focus solely on structure protection. See the 'Evacuation Routes and Vulnerability" section below for more details about evacuation.

Following the recommendations above will greatly increase the capability of fire protection resources to access structures and safely defend them. Firefighters welcome residents to request a visit from them, so that they may evaluate preparedness measures and provide feedback to property owners. Firefighters have a high capability of providing *fire protection* when access, water, defensible space and timely evacuation are present. *Refer to Part V. Fire Safe*

Communities in this CWPP to lean more about what you can do to support firefighters and protect your home and property from wildfire damage.

II.3.5. Evacuation Routes and Vulnerability

When wildfires threaten habited areas, the normal fire management response effort includes identifying evacuation *decision points*, routes, locations, and location support coordination needs. A team of fire management and local responder experts is assembled to generate the evacuation plan for that event. During that process, evacuation sites are identified which best suit the situation. That information is then quickly disseminated to the public.

Evacuation procedures are generally outlined in the Humboldt County Emergency Operations Plan. According to the Wildlands Fire Checklist contained in the Operations Plan[24], the following procedure is followed. The Incident Commander calls for an evacuation order and that message is communicated to emergency responders and the impacted residents. If evacuation of affected areas is requested by the Incident Commander, the following actions are taken in coordination with local law enforcement and fire agencies in the area:

- Identify safe evacuation routes;
- Identify and establish adequate evacuation reception areas;
- Request that the American Red Cross activate a shelter if long term evacuation is expected; and
- Provide security for evacuated areas.

A *Precautionary Evacuation* will be called in response to a fire reaching an area determined to be the outermost decision point and when it is expected to continue toward inhabited areas. An *Immediate Threat Evacuation* is announced during an immediate or immanent fire situation and residents are in danger of life-threatening events. The Sheriff's Office is responsible for implementing actual evacuation procedures. It must be noted that there is no statute which can be used to force residents from their homes. However, once they voluntarily evacuate they can be refused re-entry. Humboldt County Public Works, Road Maintenance Crews are tasked with performing traffic control duties as needed.

Common challenges to conducting a successful evacuation operation are the following:

- Narrow roads with heavy traffic;
- Roads with excessive amounts of flammable vegetating growing up to the roadside;
- Diminished visibility and air quality due to heavy smoke;
- Evacuees with special needs; and
- Citizens exhibiting over-reaction symptoms.

Much of Humboldt County has significant issues regarding the ability of residents and their animals to safely evacuate. The rugged terrain and remote nature of some communities can complicate access to and from residences. Poor or complete lack of *signage* at roads and intersections pose potential problems for emergency responders; this is especially true for the more remote, rural areas. The narrowness of smaller roads leading to these remote residences could create serious complications for emergency vehicle responders trying to gain access during simultaneous home evacuations. Many evacuation routes have been identified as being severally over grown with flammable vegetation, are poorly maintained, and have inadequate vehicle *turn-around spaces* at residences.

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[24] County of Humboldt, OES. (2002, June). Wildland fires checklist. *Humboldt County Emergency Operations Plan, Part 2: Initial Response Operations.* (p. 2-H-19.) Retrieved from www.co.humboldt.ca.us/sheriff/oes/eop/pdf/part2.pdf.

Unplanned subdivisions and historic developments that were not created with current *fire safety standards* in mind, and the general disparate nature of rural communities in Humboldt County, increase the number of people who may find themselves in these challenging circumstances when faced with possible evacuation. These areas are also characterized by low weight-bearing bridges and gated roads. Many *one-way-in, one-way-out roads*, and narrow or dead-end roads have also been identified by fire officials and community members through this planning process as one of the biggest hazards facing communities in the event of a large wildfire. These roads have been highlighted for potential mitigation projects and can be viewed on the Humboldt County Web GIS Portal at http://gis.co.humboldt.ca.us/ by selecting the "Fire Planning" application.

Specific information related to evacuation routes is identified in each of the Planning Unit Action Plans in Part IV of this CWPP. Also see section V.2.3 in Part V. Fire-Safe Communities for more information on preparing for safe evacuation and evacuation planning for pets and livestock.

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II.4. Community Preparedness

As has been stated previously, it is not a mater of if wildfires will occur in Humboldt County, but when. However, a wildfire does not have to be a disaster. It is possible to prepare for wildfire to minimize its impact on the community and individuals. Community members can greatly improve their odds of surviving a wildfire if they actively engage in preparedness activities. Early preparation is not just recommended for residents living in the warmer and drier inland areas of the county but also for those living on the coast. Wildfire history shows that forest fires can burn right to the ocean and, contrary to common perception, redwood forests do burn.

Through the community outreach associated with developing this Plan, it has become clear that many residents are unaware of their vulnerability to damage from wildfire. Even when awareness is increased, many property owners do not have the resources or the expertise to address their fire safety issues. However, if this wildfire threat is not addressed, Humboldt County will become increasingly vulnerable to loss of homes and life. With no action, the complexity of fighting fires where homes are intermixed in the wildlands will continue to challenge the efforts and safety of firefighters. The result is not only a threat to valuable community resources but also increases wildfire management costs during a time of shrinking budgets.

Although there are places where preparedness activities need to be initiated, action is being taken in specific areas of the county by groups of citizens and individuals. Community preparedness is being advocated by local fire safe councils, Firewise groups, local fire departments, the California Department of Forestry and Fire Protection (CAL FIRE), the United States Forest Service (USFS), and other local community organizations. The Humboldt County Fire Safe Council (HCFSC) works to support these groups and bring them together to collaboratively develop strategies to help communities prepare for wildfire and take actions that will mitigate potential negative impacts.

II.4.1. Fire Safe Councils

Local Fire Safe Councils

Fire safe councils (FSCs) are voluntary organizations that typically consist of local concerned citizens, representatives from state and federal fire agencies, and local fire districts and fire protection organizations who share a common, vested interest in wildfire prevention and loss mitigation. FSCs form to enhance the effectiveness of fire protection and prevention by securing grant funds and volunteer support for fire hazard reduction projects and performing community fire-safety education. Communities that organize themselves into FSCs and participate in a community wildfire protection plan (CWPP) and/or Firewise process give themselves a competitive advantage for securing grant funds, particularly federal funding through the California FSC. FSCs also provide the ideal forum for communities to discuss, analyze, and solve fire-related issues before they become a crisis. They also provide opportunities for local jobs, community partnerships, and wide-spread community involvement. To learn more about forming and sustaining a FSC go to the California FSC website at: www.firesafecouncil.org

There are six local FSCs in Humboldt County, in addition to the County FSC. Residents of several additional Humboldt County communities are working to establish new FSCs in their areas. These FSCs are developing local CWPPs and Firewise community assessments and action plans. They have also been successful in securing funding for and implementing *hazardous fuels reduction* projects within their local communities. These groups have also organized many community events raising awareness in their community about preparing for wildfire. FSCs secure funding and volunteer support for programs that educate residents and provide resources for steps that can be taken to help firefighters locate residents' homes and gain access to *fire*

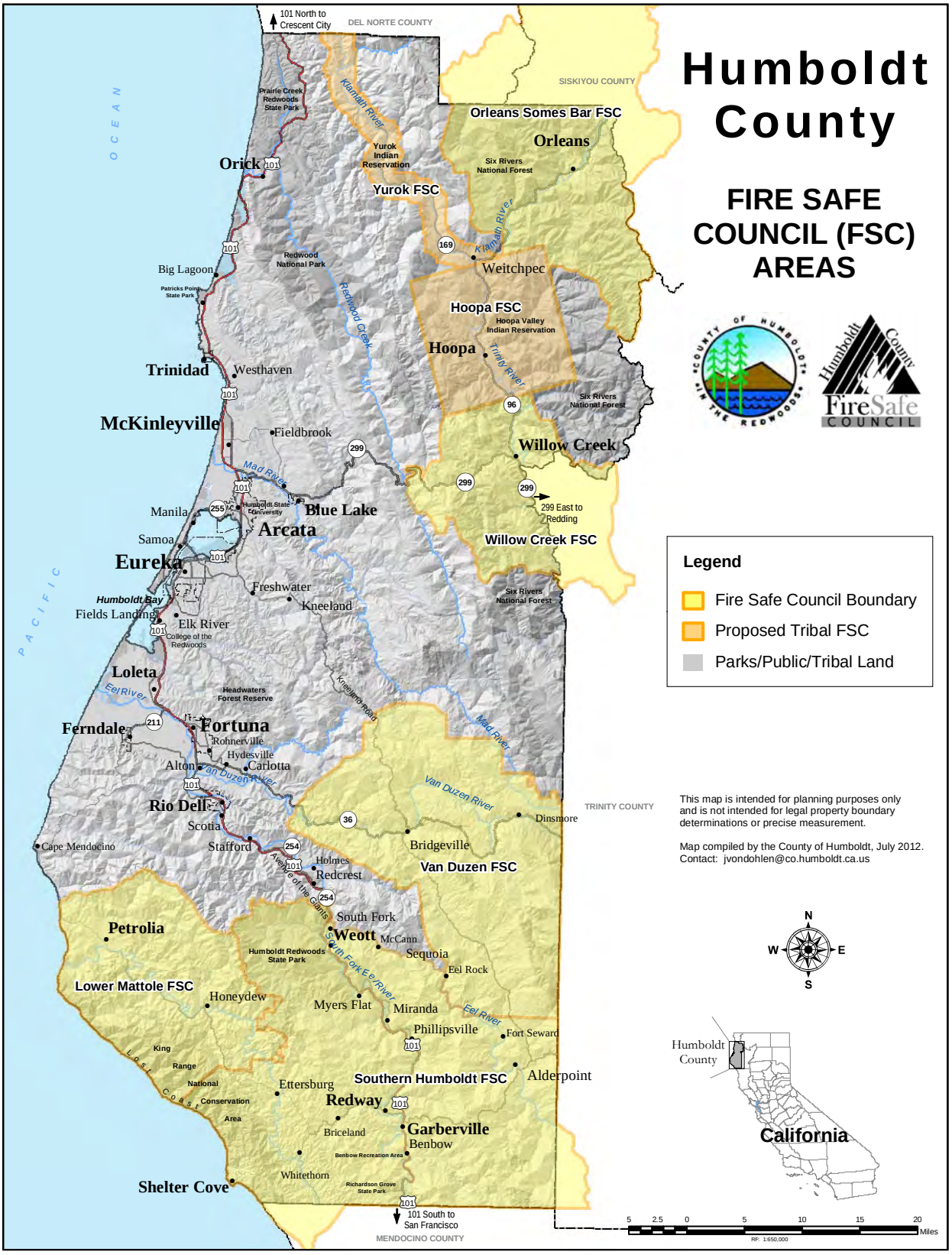
protection water. The following table lists currently active local FSCs and their contact information and Figure II.4-1 provides an illustration of where most of the local FSCs operate.[1] This map also includes the areas potentially served by newly forming FSCs on the Hoopa Valley Reservation and the Yurok Reservation. *More detailed information about all local FSCS can be found within Part IV. Planning Unit Action Plans.*

Figure II.4-1. Humboldt County Fire Safe Councils

Fire Safe Council Name	Formation Date	County CWPP Planning Unit	Contact information
Orleans/Somes Bar FSC	2001	East Klamath (Unit3)	(530) 627-3202 mail@mkwc.org www.mkwc.org/programs/firefuels/index.html
Southern Humboldt FSC	2002	Southern Humboldt (Unit 13)	(707) 923-9109 bille@asis.com www.newforestry.org/shfsc/
Lower Mattole FSC	2002	Mattole-Lost Coast (Unit 12)	(707) 629-3514 firesafe@mattole.org
Van Duzen Watershed FSC	2004	Mad-Van Duzen (Unit 11)	(707) 496-4530 jeanlouiscarmona@yahoo.com
Crooked Prairie FSC	2005	Southern Humboldt (Unit 13)	(707) 986 7705 kw@asis.com
Willow Creek FSC	2007	Trinity (Unit 7)	(707) 499-0767 admin@willowcreekfsc.org www.willowcreekfsc.org

[1] The map does not show the jurisdictional area of the Humboldt County FSC, which operates throughout the entire county.

Figure II.4-2: Fire Safe Council Area Map



Potential Fire Safe Council Startups

During the community outreach process associated with developing this Plan, several communities expressed an interest in forming a FSC. These communities include:

- Hoopa Valley Reservation
- Yurok Reservation
- Westhaven/Trinidad
- Orick
- Redwood Valley
- Kneeland
- Upper Jacoby Creek

For more information on the public process, see Part I of this CWPP.

Humboldt County FSC

The Humboldt County Board of Supervisors (BOS) formed the HCFSC in 2002. The BOS recognized that community-based fire planning efforts assist residents in making their homes, neighborhoods, and communities fire safe.

The mission of the HCFSC is to:

> Serve as a forum for the implementation of Humboldt County's CWPP, share fire-safety information, assess fire risk, promote community fire-safe planning and coordination, link fire-prevention programs, and support the fire service and local FSCs.

The HCFSC membership consists of 16 individuals representing federal, state, and local fire service agencies and organizations, along with local FSCs, the Hoopa Valley Tribe, the Humboldt County Office of Emergency Services (OES), CAL FIRE, the Bureau of Land Management (BLM), Six Rivers National Forest, and the insurance industry. Since overseeing the development of a countywide fire plan in 2006 (the Master Fire Protection Plan, or "MFPP," now referred to as the CWPP), the HCFSC has made much progress implementing several elements of the MFPP *(see Chapter I.4. 2006 Plan Implementation Progress Review, in Part I).*

Accomplishments include:

- drafting a hazardous fuels plan update;
- creating a Web GIS[2] tool showing the current level of fire service and community identified needs for hazardous fuels reduction;
- funding for and implementation of a cost-share program for treating flammable vegetation (Fire-adapted Landscapes and Safe Homes—FLASH--Program);
- assisting local FSCs with their CWPPs and Firewise activities;
- assisting with fire protection district expansion and formation;
- and much more…

To ensure implementation of the recommendations of the County CWPP, various subcommittees of the HCFSC have been formed, focusing on the following programs:

- Fuel Modification/Biomass Utilization
- Revenue Source for Fire Protection
- Level of Service (LOS) Standards

[2] Geographic Information Systems (GIS).

- Improve Emergency Dispatch Services
- Safety Element of the County General Plan Update

The committees meet regularly and are making significant progress.

The HCFSC provides guidance for a County-funded program that offers staff assistance and small grants to local FSCs to support the development of CWPPs and to help with the process of becoming a nationally recognized Firewise Community. The HCFSC also provided valuable input and guidance in the development and update of this CWPP and informed the processes of updating the Humboldt County General Plan (GPU). GPU input included recommendations for the fire protection and prevention policies and implementation measures of the GPU Safety Element and the Community Infrastructure and Services Element.

The HCFSC meets quarterly to discuss progress on projects and share ideas. There is often a special presentation provided by a content expert related to one of the major themes of wildfire mitigation and management or community preparedness. These meetings are open to the public and all are welcome. More information about these meetings and the HCFSC is available at: www.co.humboldt.ca.us/natural-resources/fire_safe_council/.

California FSC

In 1993, the statewide FSC, consisting of private and public membership, was formed to educate and encourage Californians to plan and prepare for wildfires by reducing the risk of fire to property, communities, and natural/structural resources. In 2002, this group created a nonprofit organization and board of directors, called the California Fire Safe Council (CFSC). The CFSC Mission is: Mobilizing Californians to protect their homes, communities and environments from wildfire, and their vision is: Together, people and communities have eliminated the impact of catastrophic wildfires on all they hold dear.

Since its formation, the CFSC has united its diverse membership to speak with one voice about fire safety. The CFSC has distributed fire prevention education materials to industry leaders and their constituents, evaluated legislation pertaining to fire safety and empowered grassroots organizations to spearhead fire safety programs. The CFSC provides assistance to local FSCs through: the CFSC website (www.firesafecouncil.org), the distribution of educational materials, and technical assistance--primarily through their regional representatives. More than 130 local FSCs have formed in California so far. More continue to form throughout the state, working to plan, coordinate, and implement fire prevention activities.

The CFSC works closely with the California Fire Alliance to facilitate the distribution of National Fire Plan grants used for wildfire risk reduction and education through their Grants Clearinghouse (www.grants.firesafecouncil.org). The HCFSC as well as most of the local FSCs in Humboldt County have taken advantage of this grant program; brining much needed funding into the county to support wildfire mitigation and planning projects.

Northern California Prescribed Fire Council

The Northern California Prescribed Fire Council (the Council) was formed in 2009. Since then, they have built a strong foundation with an established Steering Committee and by-laws. The Council provides a forum for discussions on prescribed fire practices, regulations, and policies, and aims to facilitate the use of prescribed burning as a fire management tool in Northern California. Semi-annual events hosted by the Council bring together a range of individuals working together to promote this goal and to increase public understanding of the benefits of prescribed burning and the role of fire in ecosystems.

The mission of the Northern California Prescribed Fire Council is to:

> "Serve as a venue for practitioners, state and federal agencies, academic institutions, tribes, coalitions, and interested individuals to work collaboratively

to promote, protect, and expand the responsible use of prescribed fire in Northern California's fire adapted landscape."[3]

The Council's Steering Committee consists of individuals representing state and federal land management agencies, environmental groups, regulatory agencies, educational institutions, tribes and indigenous coalitions, private practitioners, and local watershed and fire safe councils. These include: CAL FIRE, the United States Department of Agriculture Forest Service, the BLM, the National Park Service, the Nature Conservancy, the Wilderness Society, North Coast Unified Air Quality Management District, Humboldt State University, University of California Cooperative Extension, the Karuk Tribe, the Indigenous Peoples' Southwest Research Station, Firestorm Wildland Fire Suppression Inc., the Mid Klamath Watershed Council, and the Orleans/Somes Bar FSC. These organizations and individuals participate in the Council through working groups, attendance at open meetings, and various field tours.

The Northern California Prescribed Fire Council manages a website which contains numerous informational and outreach resources and links.[4] These include recent publications on prescribed burning practices, news articles pertaining to prescribed fire, a "CAL FIRE Vegetation Management Program Fact Sheet" and a "Air Resources Board Rx[5] Fire Fact Sheet," as well as links to other websites dedicated to providing information related to fire science.

II.4.2. Firewise

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. For more detailed information about Firewise, you can visit their website on-line at: www.firewise.org. To receive Firewise recognition, a community must:

- Conduct a community assessment and draft an action plan to address observed fire safety issues;
- Sponsor a local Firewise board to maintain local Firewise programs and track accomplishments;
- Observe an annual Firewise day dedicated to a local Firewise project;
- Invest a minimum of $2.00 annually per capita into local Firewise activities; and
- Submit an annual report to Firewise Communities/USA, documenting continued compliance with the program.

The HCFSC and County staff have worked closely with local communities to gain recognition as Firewise Communities/USA sites. Secure Rural Schools Act, Title III grants have been awarded by the County to local FSCs to conduct community risk assessments, write Firewise plans and hold community Firewise days in coordination with local fire departments. The National Fire Protection Association's (NFPA) Firewise Communities program teaches people how to adapt to living with wildfire and encourages neighbors to work together and take action to prevent losses. The program provides many tools and resources to communities.

As of 2011, the Humboldt County communities of Bridgeville, Honeydew, Orleans, Petrolia, and Willow Creek had achieved national Firewise recognition. Several more communities are interested in participating in the program and some have taken meaningful steps toward becoming

[3]Northern California Prescribed Fire Council. (2012). *About Us: Our Mission.* Retrieved from http://www.norcalrxfirecouncil.org/About_Us.html

[4] Northern California Prescribed Fire Council. (2012). *Resources*. Retrieved from http://www.norcalrxfirecouncil.org/Resources.html.

[5] Rx = Prescribed fire

Firewise. One very good example of this is in the Upper Jacoby Creek Neighborhood, near the City of Arcata. After helplessly watching a neighbor's house burn to the ground, a group of residents dubbed themselves the Upper Jacoby Creek Firewise Board and committed to becoming a Firewise Community. This group worked diligently to better understand local risks and hazards. The importance of preparing their community for wildfire was realized when they learned that their homes are not located within the boundaries of any local fire protection district and that it could take up to 45 minutes for emergency responders to arrive on the scene. In October 2011, this group of dedicated residents held a Firewise event at the bottom of their road with the intention of getting fire safety information out to their neighbors. At the end of the 2012, the Upper Jacoby Creek Firewise Board completed a Firewise Community Assessment and Action Plan, submitted their application, and successfully achieved recognition as a Firewise Community.

Firewise assessments and action plans serve as excellent tools for communities to collaboratively learn about and identify actions to address wildfire hazards in their community. Firewise also provides an opportunity for communities, not only to raise awareness about wildfire risks, but to showcase what they are already doing to mitigate those risk. Community Firewise events have been used to share the results of successful projects such as; a new or updated local fire plan, educational brochures or videos, or mechanical treatments and prescribed burns to manage hazardous vegetation and improve forest health. Some of the communities that have achieved Firewise status were also awarded Title III grant funds from the County to implement components of their action plan. So far, Willow Creek and Bridgeville have used funding to design *Blue Dot Programs* (where a round, blue reflector is placed on water sources) that help identify and/or develop water sources that are appropriate for fighting fires. The Bridgeville project also includes posting of address and road signs to improve the ability of firefighters to find residences in an emergency.

II.4.2. Fire Service Preparedness Programs

Being prepared for wildfire involves learning about how to take advance steps that will mitigate damage if a fire does occur, how to prevent fire, and what to do when a fire occurs. The fire service achieves these goals through what they call "prevention and education" programs. Fire prevention and education programs can significantly lessen the chance of fire occurring and the cost of damage from and suppressing fire when it does occur. There are a number of agencies involved in the development and delivery of fire prevention and education materials. The following is a description of fire prevention and education activities by fire-related agencies in Humboldt County.

II.4.3. Local Fire Education And Prevention Programs

Fire Prevention Officers Section

The Fire Prevention Officers Section of the Humboldt County Fire Chiefs' Association brings together the fire prevention officers of fire departments throughout the county. This group contains approximately 12 regular members and meets on a monthly basis. The Fire Prevention Officers Section acts as a working group for local fire prevention officers. Recently, the Fire Prevention Officers Section has been working to clarify state and federal fire prevention construction and occupancy standards in order to assist contractors, business operators, local government, and local fire agencies to improve fire safety. To that end, they are developing standards for smoke detectors, key boxes, fire department connections, fire sprinkler inspector test and alarm monitoring, fire extinguishers, cooking hoods, premises identification, roads, burn permits, and gated communities. The Fire Prevention Officer's Section also manages the smoke simulator trailer used at the Humboldt County Fair and in schools.

More information about the Fire Prevention Officers Section of the Humboldt County Fire Chief's Association can be found by visiting their webpage on the City of Eureka's website

located at: http://www.ci.eureka.ca.gov/depts/fire/prevention/standards.asp, or by emailing Fire Chief, Lon Winburn at lwinburn@fortunafire.com.

Humboldt Bay Fire Department

Humboldt Bay Fire represents the consolidation of the Eureka Fire Department (protecting the City of Eureka) and the Humboldt No. 1 Fire Protection District (protecting the greater Eureka area). Consolidation talks were on going for 50+ years until finally in 2012 the Humboldt Bay Fire Joint Powers Agreement was signed in November of 2012 officially combining the two entities.

Community fire protection can be divided into two strategic elements: reactive and proactive. The reactive element involves committing resources to an incident after it has started; this is the role of the Suppression Division of Humboldt Bay Fire. The proactive element addresses the prevention of incidents, and the minimization of incident impacts, through safety education and code enforcement; this is the role of Humboldt Bay Fire's Fire Prevention Division. The Fire Prevention Division administers specialized services involving fire code enforcement, fire education, fire investigation, and State-mandated building code enforcement and inspections. The Fire Prevention Bureau supports the Suppression Division by providing additional personnel for incident management, project administration, support services, training, and vacancy back-fill.

The fire prevention and safety education activities of Humboldt Bay Fire are closely tied to the themes of the National Fire Protection Association. The Fire Prevention Division provides public education in schools, at fairs and other events, and during fire prevention week. It also provides specialized fire safety classes on fire extinguisher use, first aid, and hazardous materials (awareness and operator level).

Humboldt Bay Fire conducts extensive school visits during Fire Prevention Week (which occurs annually during the week containing October 9th – the date of the 1871 Chicago Fire). The Department provides fire safety lectures and demonstrations for all grades. Humboldt Bay Fire distributes smoke detectors to students in return for a signed "contract" that contains requirements for installation, maintenance, and regular battery replacement.

Humboldt Bay Fire can be contacted by calling Battalion Chief William Reynolds at (707) 441-4000 or (707) 445-4900, or by sending an email to: wreynolds@HBFire.org. More information can also be found by visiting their website at: http://humboldtbayfire.org/

Arcata Fire Protection District

The Arcata Fire Protection District has an active fire prevention/safety education program. The Arcata Volunteer Fire Department visits pre-school to high school classes within the District year-round, and provides "show and tell" with the engines and equipment, gives "Stop, Drop, and Roll" drills, tests students' knowledge of fire safety using flash cards, and plays "Fire and Life Safety Bingo" with older students. The Arcata Fire Protection District primarily develops and distributes its own education materials.

The Fire and Life safety trailer, owned by the Humboldt County Fire Prevention Association, is normally housed at the Mad River station of the Arcata Fire Protection District. The District uses the trailer on a regular basis to deliver fire safety education to children in schools and the community.

The Arcata FPD can be contacted by calling (707) 825-2000; more information can be found by visiting their website at: www.arcatafire.org/.

Fortuna Volunteer Fire Department

The Fortuna Volunteer Fire Department (VFD) provides fire prevention and safety services through their Fire Prevention Division and Public Education Division. Their efforts include implementing and maintaining community outreach programs that educate and inform the public

about fire prevention; in addition to giving safety presentations on a range of topics, the Fortuna VFD also distributes informational materials at local community events. The Fortuna VFD is also committed to enhancing public safety by conducting fire safety inspections at businesses, residences, schools, as well as children's day cares and senior residential care units.

The Fortuna VFD may be contacted by calling (707) 725-5021 or sending an email to Fire Chief, Lon Winburn at lwinburn@fortuanfire.com; more information can also be found by visiting their website at: http://fortunafire.com/.

Fire Prevention and Building Plan Review

According to the Humboldt County Building Inspection Division (BID), fire departments are only involved in commercial permit/plan review and review of permits for commercial uses and special occupancies. Some departments, such as Arcata, Humboldt Bay, Fortuna, and others, have the capabilities to perform in-house plan review. If a local department does not have capacity to do a plan review, the BID or the State Fire Marshall will perform the required review. In some cases, such as when a complicated fire sprinkler system is required, consulting engineers perform the review.

II.4.4. State Fire Education and Prevention Programs

California Department of Forestry and Fire Protection (CAL FIRE)

CAL FIRE, through the Unit Fire Prevention Officer, maintains an active fire safety education program. The CAL FIRE website[6] contains a wide variety of fire safety information, including:

- a homeowner's safety awareness checklist and other homeowner responsibility information;
- camping and burn permit information;
- tips regarding the safe use of holiday fireworks;
- teacher's tools and Smokey Bear information for kids;
- Roadside Fire Prevention Signs;
- Smokey Bear Fire Danger Rating Signs; and
- information regarding the CAL FIRE Volunteers in Prevention Program.

The CAL FIRE, Fire Prevention Officer and other staff visit elementary schools in the springtime, prior to the beginning of fire season, and disseminate fire safety education. CAL FIRE uses a "team teaching" approach to delivering elementary school fire safety education, working with teachers, local fire agencies, and Volunteers in Prevention program participants. Subjects include match safety, Smokey Bear, and exercises focusing on "two ways out" of the house for kids, "Stop, Drop and Roll," "911," and "Fire Drill."

The Volunteers in Prevention program (VIP) involves private citizens who donate their time to provide public education at community events, distribute fire prevention materials, inspect homes for proper clearances, and support emergency fire information and communications operations. CAL FIRE has 2,600 VIPs statewide and many local VIP participants. VIP also includes a specialized group of volunteers (HAM radio operators and CB radio groups) who provide additional communication networks for CAL FIRE during emergencies, including wildfires, earthquakes, and floods.

CAL FIRE also supports Fire Prevention Week and Wildfire Awareness Week, participates in local disaster fairs, and works with local fire agencies at a booth at the Humboldt County Fair.

[6] CAL FIRE (California Department of Forestry and Fire Protection). (2012). Retrieved from http://www.fire.ca.gov/

The booth includes a simulator for children to practice "two ways out" of the house in a mock-up of a bedroom with simulated smoke. CAL FIRE also funds and carries out various types of wildland fuels treatments, for the purpose of reducing fire hazard or severity, through a number of programs. Programmatic environmental documents provide the California Environmental Quality Act (CEQA) disclosure and analysis for fuels projects carried out under the Vegetation Management Program[7] (VMP) and California Forest Improvement Program[8].

The State Responsibility Area (SRA) Fire Prevention Benefit Fee[9] was enacted in 2011 as new annual Fire Prevention Fee to support fire prevention services within the SRA. The fee is applied to all habitable structures within the SRA. Property owners are charged $150 fee per habitable structure; defined as a building that can be occupied for residential use. A reduction of $35 per habitable structure will be granted for properties located within the boundaries of a special district that provides local fire protection services.

Although this fee was enacted to generate revenue for much needed wildfire prevention activities, it has been controversial in Humboldt County and the state at large. Local fire departments are concerned that residents who must pay the fee will be less inclined to support their local fire protection services. The Howard Jarvis Taxpayers Association[10] filed a class action lawsuit that claims that the fee is illegal. The future of the fee is unclear, but in the meantime, property owners are required to pay the fee.

The CAL FIRE VMP is a cost share program that allows public and private landowners to participate in wildland fuel reduction projects. The primary tool used is prescribed fire, although in more recent years CAL FIRE has used the program for mechanical treatments of vegetation as well. The VMP program also acts as a public education tool in that it demonstrates reduction in wildland fuels and in some cases improvement of wildlife habitat.

For more information about CAL FIRE's Fire Prevention Unit, please contact Pre Fire Planning, Battalion Chief, Mark Rodgers by sending an email to mark.rodgers@fire.ca.gov or visit the CAL FIRE website at: www.fire.ca.gov/.

University of California Cooperative Extension Supported Programs

The University of California Cooperative Extension (UCCE) Humboldt-Del Norte Counties chapter devotes energy, research, and resources to addressing local issues. Improving fire safety and achieving a greater understanding of the role of fire in human and natural communities are among their many goals. The UCCE has developed a range of useful publications, online tools, and other resources providing fire-related information and materials on topics including: hardening homes against wildfire and fire-safe landscaping strategies; the science of fire and prescribed burning techniques; and the influence of sudden oak death on fire ecology, fire behavior, and fire suppression operations. Additionally, the UCCE has staff available for answering fire-related questions and advising homeowners on how to improve their fire safety and preparedness.

Some of their online resources pertaining to fire include the following:

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[7] CAL FIRE. (2005, April). *CDF Vegetation Management Program (VMP).* Retrieved from http://www.fire.ca.gov/resource_mgt/downloads/VMP2.pdf

[8] CAL FIRE. (2012). California Forest Improvement Plan. *Resource Management.* Retrieved from http://calfire.ca.gov/resource_mgt/resource_mgt_forestryassistance_cfip.php

[9] State of California: California Fire Prevention Fee. (2012). *About the Fire Prevention Fee*. Retrieved from http://www.firepreventionfee.org/index.php

[10] Howard Jarvis Taxpayers Association (HJTA). (2012, October 3). HJTA Files Class Action Lawsuit Against Fire Tax. *Press Releases.* Retrieved from http://www.hjta.org/press-releases/pr-hjta-files-class-action-lawsuit-against-fire-tax

- "Home Survival in Wildfire-Prone Areas: Building Materials and Design Considerations"[11] - A publication outlining the importance of defensible space in protecting homes from destruction from wildfire and providing information to guide homeowners in making "fire wise" decisions regarding their home design and choice of building materials. This publication offers detailed explanations and illustrative photographs on which design strategies are more vulnerable or resilient to wildfire and why. This publication helps enhance the reader's general fire awareness and preparedness.
- "Homeowners Wildfire Mitigation Guide"[12] - This section includes an exploration of various factors contributing to the likelihood of home ignition and destruction. This section also offers advice on how to increase your home's survivability in wildfire events. It outlines basic improvements that can be made to the tops and sides of houses, as well as vents and surrounding landscapes to increase a home's resilience to wildfire. There are also a number of appendices that include useful materials such as a list of inexpensive "quick fix" suggestions, a pre-evacuation checklist, and a checklist for surveying your home's surroundings and potential vulnerability.
- "Sudden Oak Death-Caused Changes to Surface Fuel Loading and Potential Fire Behavior in Douglas-fir-tanoak Forests:"[13] - A publication on the ways the presence of sudden oak death can impact the spread and intensity of wildland fires and what that means for firefighters' suppression strategies.

The Fire section within the UCCE website also provides a link to the California Fire Science Consortium (CFSC) website[14] which serves as a forum for exchanging fire knowledge and aims to make fire science information available to the greater public. In addition to providing the most up-to-date research and information on fire ecology, the CFSC website hosts a discussion forum, a number of fire-related webinars and blogs, as well as a monthly newsletter. The CFSC website also includes a page through which people may submit questions and receive answers from fire experts in California.

More resources and information can be obtained by visiting the Fire section of the UCCE Humboldt-Del Norte Counties website at: http://cehumboldt.ucdavis.edu/Fire/; the Humboldt County UCCE office can also be reached by calling (707) 445-7351.

Community Emergency Response Teams (CERT)

Opportunities for Humboldt County residents to increase their emergency preparedness are available through the Regional Training Institute, an information center that collaborates with Humboldt State University's Office of Distance and Extended Education to offer regional disaster preparedness training in Humboldt, Del Norte, Mendocino, Trinity, and Siskiyou counties. The

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[11]Quarles, S.L., Valachovic, Y., Nakamura, J.M., Nader, G.A., & De Lasaux, M.J. (2010, May). Home survival in wildfire-prone areas: Building materials and design considerations. *UCANR (University of California: Agriculture and Natural Resources) Publication 8393.* Retrieved from http://anrcatalog.ucdavis.edu/pdf/8393.pdf © 2010 Regents of the University of California. Used by permission.

[12] UCANR (University of California: Agriculture and Natural Resources). (2012). *Homeowner's Wildfire Mitigation Guide*. Retrieved from http://ucanr.org/sites/Wildfire/ © 2012 Regents of the University of California. Used by permission.

[13] Valachovic, Y., Lee, C.A., Scanlon, H., Varner, J.M., Glebocki, R., Graham, B.D., & Rizzo, D.M. (2011). Sudden oak death-caused changes to surface fuel loading and potential fire behavior in Douglas-fir-tanoak forests. *Forest Ecology and Management, 261, 1973-1986.* Retrieved from www.cafiresci.org/storage/papers/psw.2011.valachovic.SODcausedchanges.FEM.pdf

[14]California Fire Science Consortium. (n.d.) Retrieved November 26, 2012 from http://www.cafiresci.org/

Institute's primary focus is *Community Emergency Response Teams* (CERT) training courses, which offer groups of local citizens training in basic disaster response skills, such as fire safety, light search and rescue, team organization, and disaster medical operations. These skills and training make it so that CERT members can effectively assist others in their community and neighborhoods following a disaster event. These community teams become especially valuable when professional emergency responders are not immediately available to help, which is not unlikely in the more remote communities of Humboldt County. These courses utilize informational material provided to Citizen Corps by FEMA's Emergency Management Institute and augment that material with information specific to the northwestern California region.[15] Although CERT training comprises the cornerstone of the Regional Training Institute, they also offer other regionally specific preparedness classes, such as a "Living on Shaky Ground" course that helps inform and prepare citizens for disastrous earthquake incidences.

More resources and information can be found by visiting the Regional Training Institute website at: www.humboldt.edu/rti; emailing rti@humboldt.edu, or calling 707-826-3731.

II.4.5. Federal Fire Education and Prevention Programs

U.S. Forest Service – Six Rivers National Forest Wildfire Prevention Program

The Six Rivers National Forest (SRNF) wildland fire prevention program focuses primarily on wildfire detection, wildfire origin and cause investigations, State commercial burning permit issuance, public education, and community fire-safe awareness. SRNF fire prevention activities also include enforcement and permit compliance operations and oversight for forest industrial operation and permittee activities that occur on both private and SRNF National Forest lands.

In addition to the SRNF Wildfire Prevention Plan, each local Ranger District maintains and annually updates a local prevention plan. The objective of the prevention plan is to provide specific local direction to fire management personnel on prevention activities in the Districts. Each Ranger District is involved in implementing the SRNF Wildfire Prevention Plan. The Plan's principal goal is to sustain healthy and productive ecosystems and to protect human life and property.

Plan components related to fire prevention/safety education include:

- Structural Hazard Inspection and Debris Management
- School Presentations, Team Teaching, and Children with Matches
- Public Information Programs (at Visitor Centers, Rodeos, Fairs, Parades, etc.)

Public education-related prevention tasks include the use of fire danger ratings, involvement in FSCs, and involvement in various public events. Ranger District level staff has provided educational outreach throughout the SRNF and Humboldt County, including the Humboldt County Fair (including the fire and smoke safety trailer with the Humboldt County Fire Prevention Association, CAL FIRE, and local fire organizations), Fire Prevention Week, team teaching in schools, and other local events. District staff utilizes education materials, including the Smokey Bear costume and associated symbols, to convey fire safety themes to children.

SRNF fire prevention education objectives include: instituting programs to make local communities aware of the need for local residential hazard reduction; public education to reduce the number of abandoned campfires; and education and public contact to strive for a zero occurrence of fires set by children playing with matches.

[15] Humboldt State University: Regional Training Institute – Community Disaster Preparedness. (n.d.) *Community Emergency Response Teams (CERT) Training.* Retrieved November 27, 2012 from http://www.humboldt.edu/rti/cert

More information on SRNF can be found by visiting their website at: www.fs.usda.gov/main/srnf/home, calling (707) 441-3604, or by sending an email to Fire Prevention Officer, Robert Rivelle at rrivelle@fs.fed.us.

BLM Wildfire Prevention Program

The BLM Arcata Field Office's wildland fire prevention efforts are concentrated on community fire-safe awareness and educating the public on the benefits of fire prevention and the necessity of a proactive hazardous fuels management/reduction program. Particular program emphasis is placed on community education programs for those wildland-urban interface (WUI) areas and communities at risk within or adjacent to BLM public lands. Additionally, in 2011, the California BLM put out a publication titled, "Wildfire Protection,"[16] which outlines some of the challenges to fire protection within the state, as well as the BLM's contributions and project efforts to improve fire safety in California.

More information on the BLM's wildland fire prevention efforts in Humboldt County can be obtained by contacting Fire Management Officer, Tim Jones at tmjones@blm.gov, or by calling the BLM Arcata Field Office at (707) 825-2300 or visiting their website at: www.blm.gov/ca/st/en/fo/arcata.html.

II.4.6. Areas Without Any Community Preparedness Leadership

There are still areas in Humboldt County where there is a pressing need for organized efforts to prepare community members for wildfire and other natural hazards. These areas include the following:

- **Maple Creek** – The Maple Creek Fire Company recently shut its doors and ceased operating. This leaves community members without committed, near-by, year-round emergency service. Blue Lake Fire and Kneeland Fire will respond to the area but may not always be available and have long travel times to arrive on scene. The Maple Creek area is also not served by a local FSC or Firewise group.
- **Redwood Valley and Titlow Hill** – These areas do not have a local fire department. Blue Lake and Willow Creek Fire will and do respond to these areas but it can take up to 45 minutes to arrive on scene and it is outside of these fire department's jurisdictional area so resources may not always be available. During fire season CAL FIRE is responsible for fire protection in this area from their Trinidad fire station, which is close to an hour away. The Willow Creek FSC offers some of their preparedness programs to this area but it is far for them to travel. There is a clear need for the development of a local effort.
- There are many developed areas within the county that are outside of the boundaries of a service districts. The fire departments associated with the districts will respond to these areas but have no obligation to do so and receive no compensation for their efforts. Many of these places are far from fire stations and expect long response times from fire service. Residents of these areas need to prioritize personal responsibility for their safety and make sure to carry out effective wildfire mitigation activities. Where they do not already exist, there is a need for local wildfire preparedness groups and organizations in these areas.

[16] U.S. Department of the Interior, Bureau of Land Management (BLM) California. (2011). *Wildfire Protection.* Retrieved from http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/caso/publications.Par.31582.File.dat/SinglePages.pdf.

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II.5. Risk Assessment Summary

II.5.1. Community-Identified Risks, Hazards, Assets, and Resources

Through this Community Wildfire Protection Plan (CWPP) process, a series of 16 community workshops were held throughout Humboldt County in early 2012. At those meetings, residents were given the opportunity to review previously identified local risks, hazards, fire protection resources, and assets information from the 24 community meetings held in 2004 and 2005 for the 2006 Master Fire Protection Plan (MFPP). A similar process to identify risks, hazards, assets, and fire protection resources was undertaken using the mapping exercise described in Part I of this CWPP. This extensive public process has led to the development of a large database of community-identified information. That database is available for public review and use at the Humboldt County Web GIS Portal, http://gis.co.humboldt.ca.us/ under the "Fire Planning" application. A summary of the data gathered at each meeting is provided in each Planning Unit Action Plan document in Part IV of this CWPP. This community-generated information was also included in the analysis for this risk assessment summary.

II.5.2. Summary of the Humboldt County Risk Assessment

Although the probability of wildfire seems low to many in and outside of coastal Humboldt County, this risk assessment has shown that the possibility of a large wildfire conflagration and resulting damage is highly likely, especially given the current changing weather patterns. All Humboldt residents, organizations, and government entities share this risk, as well as a responsibility to minimize it.

The following presents a summary analysis of each of the Risk Assessment chapters in Part II of this Plan. The analysis is based on a qualitative scale from "low" to "very high", with "very high" signifying the highest risk. In the case of Wildfire Protection Capabilities and Community Preparedness, a lower rating signifies higher risk.

Wildfire Environment

Risk of Wildfire Occurrence

"Risk of wildfire occurrence" refers to the possibility of a wildfire occurring based on factors such as fire history and ignition risk *(see Figure II.1-11. Fire History Map 1908-2010 and Figure II.1-12.Potential Incendiary Wildfire Ignition Sources Map in Chapter II.1.Wildfire Environment of this Risk Assessment).* Risk is based on historic evidence of wildfire starts and the presence of ignition sources such as frequent lightning storms, occupied residential properties, widespread camping, power lines, heavily traveled roads, history of arson, and logging operations. Fire has been a significant factor in Humboldt County's history. Studies have suggested an historical *fire return interval* of 50 to 100 years in the northern part of the county, and 12 to 50 years in the south.[1] The county also has a strong presence of *ignition sources* with a prevalence of homes sprinkled throughout Wildland-Urban Interface (WUI) areas, power lines crisscrossing the county, and a massive network of well-traveled rural roads. Lightning fire ignitions are generally less prevalent in Humboldt County than in other areas but they do occur; especially in the northeastern area of the county. Marijuana cultivation also contributes to an increased risk of structure fire and wildfire. The county is divided into two distinct areas of wildfire risk. **The northeast and extreme southwest parts of the county have a *high* risk of wildfire occurrence, while the coastal areas and river valleys have *moderate* risk and generally better**

[1]CAL FIRE: Humboldt – Del Norte Unit (HUU). (2011). *Draft 2011 Unit Strategic Fire Plan Humboldt – Del Norte Unit.* (p. 11). Retrieved from http://www.co.humboldt.ca.us/naturalresources/fire_safe_council/pdf_files/2011%20huu%20strategic%20fire%20plan.pdf .

fire-protection access, which increases initial attack success. *For more information on wildfire risk, please see section II.1.5 "Wildfire Risk and Fire History." Section II.2.1 "Community and Economic Assets" contains a discussion on the cultivation of marijuana and its potential impacts to fire risk.*

Fire Hazard Severity

Fire hazard is a measure of how resistant to control a wildfire is once it starts; it is affected by vegetation, topography, and weather. The relationship between these three factors has a tremendous effect on firefighters' ability to manage a wildfire in a way that minimizes damage to communities and natural resources. A site's hazard ranking tells us the expected behavior of fire in severe weather[2] (e.g. intensity, speed, and embers produced). Fire Hazard Severity Zones (FHSZs) are how the state of California assesses and defines fuel hazards. The FHSZs range from Medium to High to Very High. Local (urban or suburban) areas of Humboldt County (LRA[3]) are not classified in this system, but are generally considered to have low to moderate ratings in Humboldt. **Generally, the coastal areas and river valleys with fog influence are rated *moderate*, the western side of the county is rated *high*, and the eastern side of the county is rated *very high* fire hazard severity.** *For more information on fire hazard severity, please see section II.1.4 "Wildfire Hazard."*

Structural Ignitability

Structural ignitibility means the ability of structures—especially homes—to burn. It is generally tied to the age of a given development (or structure), with newer developments built to the current or recent WUI building codes receiving a "low" ignitability designation. Older wooden homes, which are commonly made of redwood or fir in Humboldt County, generally have much higher structural ignitability than newer homes, unless these older homes have been retrofitted to current WUI building standards. Relatively few homes and structures have been lost to wildfire in Humboldt County to date, although this is likely due to few wildfires burning close to urban areas, rather than a reflection of fire-safe construction. There has been an increase in structure fires due to faulty wiring for indoor marijuana grows. Although these are not technically wildfires, they do, in some cases threaten nearby wildlands and neighborhoods. **The complete range from *low to very high* structural ignitability is found throughout Humboldt County, although most homes tend toward higher structural ignitability.** *For information on reducing structural ignitability, please see section II.2.1 "Structural Ignitability," and section V.1.1 "Hardened Homes."*

Interface Fuels

Interface fuels in this risk assessment generally refers to anything that can burn— including ornamental vegetation or the stuff found around homes such as patio furniture—that is surrounding a structure, and often directly adjacent to and including homes. There are commonly a lot of fuels surrounding homes in the coastal zones, likely resulting from a false sense of security from the prevailing climate and a lack of local understanding of fire hazards. Throughout the county, there are heavy fuels surrounding homes, whether these homes are rural homesteads with firewood and outbuildings, or urban/suburban homes with an abundance of highly flammable vegetation. **Therefore, interface fuels throughout Humboldt County are *high* to *very high*.** *For information on interface fuels, please see Part IV. Planning Unit Action Plans and Part V. Fire-Safe Communities.*

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[2] Severe weather occurs when wind speed, humidity, and temperature make conditions favorable for a catastrophic fire.

[3] Local Responsibility Area (LRA).

Values and Assets at Risk

Humboldt County Values and Assets

Humboldt County is known for its natural beauty—redwood forests and clean, cool watercourses, diverse wildlife habitat, and abundant natural resources—as well as its wealth of natural resources, from timber to fisheries. This wellspring of ecological diversity and beauty is valued very high and treasured, both nationally and internationally. It is increasingly becoming a tourist and retirement destination, especially given changing climates. These natural resources are important to the local economy and could be severely impacted by wildfire. Property values here range from moderate to moderately high; property values did not drop in Humboldt the way they did in much of the West in recent years, following the housing crisis. There is a significant concentration of native, indigenous communities, also rating very high in importance, both nationally and locally. Finally, the significant underground economy here, which has been referred to as the "Silicon Valley of Medical Marijuana," could be greatly impacted by wildfire and, for that reason, is also valued as "high." **Therefore, the Values and Assets at risk for Humboldt County are given a *high* to *very high* rating.** *For more information on values and assets at risk, please see Chapter II.2. Values and Assets at Risk.*

Wildfire Protection Capabilities

Level of Fire Protection Service

Due to the highly diverse range of community characteristics and *fire protection* needs throughout Humboldt County, each local fire department strives to develop a response and deployment system that reflects community needs, expectations, and local risks, while staying within the organization's revenue and support constraints. A coordinated approach to response is also crucial in Humboldt County. Fire departments are quick to assist each other as well as to state and federal partners, and vice versa. Since the 2006 MFPP and the resulting work of the Humboldt County Fire Chiefs' Association and the Humboldt County Fire Safe Council, a countywide *mutual aid agreement*, a standardized numbering agreement, training and radio communications, and a local incident support team have been or are in the process of being developed.

Seasonality strongly affects federal and state fire protection capacity in Humboldt County. Federal fire protection agencies are currently fully staffed and stable, but like CAL FIRE—whose staffing is down due to the state budget, which means less fire fighters on local engines—they can be pulled away at anytime to fight fire anywhere else in the country. This usually means that local fire protection resources are spread much thinner, and often during the highest time of fire danger, as was seen during the Lighting Complex fires of 2008. Fire protection capability has improved since the 2006 MFPP, yet sustainability of some smaller, rural volunteer fire departments is still an issue (e.g. funding, personnel, training, regulations/unfunded mandates, and liability) and complete, year-round community protection coverage for developed areas is also a major issue. **Overall, fire protection capability for the County is *moderate.*** *For more information on fire protection please see Chapter II.3. Wildfire Protection Capabilities.*

Fire Protection Support

Fire protection support is based on the ease of fire engine access to homes, adequate water supply and pressure, and community support both financially and through volunteers. It is dependent upon sufficient *defensible space* around structures and timely evacuations by local residents. Access is related to the fire codes at the time of development, the terrain, and the potential for road blockage. Adequate defensible space allows firefighters the ability to protect a home safely. Timely evacuation allows firefighters to focus solely on structure protection. Local agencies have a high capability of providing fire protection when timely notice, access, water, defensible space, and timely evacuation are present. There are communities in Humboldt that

enjoy strong community support for local fire services. However, achieving the support described above is highly challenging in the County as a whole, **making support for fire protection in Humboldt County generally *low* and even lower during extreme fire weather events.** *For more information on access, water supply, defensible space, and evacuation, see Part V. Fire-Safe Communities; for more information on ways local residents can prepare for emergencies please see Chapter II.4.Community Preparedness.*

Evacuation Vulnerability

Much of Humboldt County has significant issues regarding the ability for residents and their animals to safely evacuate. Given the precipitous *topography*, unplanned subdivisions and historical developments, and the disparate nature of rural communities, the existing road infrastructure is marginally adequate under normal conditions. There are many *one-way-in, one-way-out*, narrow, dead-end roads; a significant potential for landslides; and high fuel loads and arrangements that physically impede travel along key *evacuation routes*. Many non-paved roads are poorly maintained, and require very slow speeds and 4x4 vehicles. There are many low weight-bearing bridges, gated roads, and unmarked roads and addresses. Hence, early evacuation significantly increases residents' ability to leave safely, while also reducing road congestion. Later evacuations limit travel routes and safe destinations. **The existing road infrastructure is inadequate in most areas of the county for safe and effective evacuation; therefore evacuation vulnerability is *very high.*** *For more information on evacuation please see Section II.3.5"Evacuation Routes and Vulnerability" and the "Evacuation" section of each Planning Unit Action Plan in Part IV.*

Community Preparedness

Community Fire Safety Efforts

Multiple opportunities exist for community members in Humboldt County looking to take responsibility for preparing their communities for wildfire. Forming a local fire safe council (FSC) is a significant step communities can take towards improving their fire safety. Local FSCs are volunteer organizations that collaborate to enhance fire protection and minimize potential losses to wildfire. Through FSCs, residents identify local fire hazards and develop projects to address them. Six local FSCs exist in Humboldt County. These local entities are supported by the Humboldt County FSC (HCFSC). **Although a number of communities have taken initiative to increase their fire preparedness, several "Communities at Risk"[4] have multiple unmet hazard mitigation needs. Therefore, community preparedness through fire-safety efforts is *moderate* in Humboldt County.** *For more information on Community Fire Safety Efforts, please see Chapter II.4. Community Preparedness.*

Fire Prevention and Education

Many fire service entities and fire management jurisdictions in Humboldt County devote energy and resources to promoting fire education and prevention programs within local communities. Local programs include: creating fire-safety codes and standards pertaining to building construction, burn permits, road access, etc.; conducting fire-safety lectures and demonstrations within schools; advocating the use of fire-safe building materials and landscaping designs; and sharing fire-safety information and resources. These education programs stress the importance of citizen involvement in local hazard mitigation and fire planning to help protect communities from wildfire. Fire-safety education and prevention programs are prevalent among Humboldt County's fire protection districts. **Although public understanding of fire prevention and fire safety is increasing in Humboldt County, education is still needed, especially among**

[4] *See section II.2.1 for more information on designated "Communities at Risk" from wildfire in Humboldt County.*

the smaller, more remote Communities at Risk. Therefore, community preparedness through fire prevention and education is *moderate* in Humboldt County. *For more information on Fire Prevention and Education, see Chapter II.4. Community Preparedness.*

II.5.3. Furthering Risk Assessments in Humboldt County

The *risk assessment* undertaken for this CWPP was done at a very coarse scale. As shown in Parts I, II, and III of this plan, local CWPPs and Firewise Assessments have been completed for some areas of the county. However, a more detailed assessment of risks (home by home) is still needed at the local level for many areas. Residents can assess their own risk based on a qualitative analysis of the issues below and the assessment form in the Appendices. FSCs, homeowners associations, and other neighborhood organizations can do this at the neighborhood or community scale. Two methodologies are provided in the appendices. Appendix D: Mapping Exercise Instructions describes the methodology used for the mapping exercise during the CWPP community workshops. Appendix E: Home Risk Assessment, is a risk assessment tool for analyzing a specific property. A localized risk assessment would include a parcel-level analysis of the following components:

- Hardened homes: local building materials, construction, and age of structures
- Community values at risk
- Interface fuels: home landscaping and defensible space
- Topography and location in the landscape
- Community education and awareness
- Community emergency preparedness
- Community preparedness plans provided to public safety agencies
- Sources of local ignitions
- Ingress and egress routes
- Water sources
- Existing fuel reduction
- Impact of surrounding wildlands/vegetation
- Post-fire effects (e.g. erosion, invasive species, etc.)

To fully assess local fire risk as systematically and comprehensively as possible can be a significant undertaking. Humboldt County residents—especially through local FSCs and other neighborhood or community organizations—are encouraged to use the resources in this CWPP to better understand the fire hazards and risks where they live. In this way, Humboldt County can continue to improve its community fire safety and hence reduce its risk of catastrophic wildfire damage.

Part III. Countywide Action Plan

Overview

This Community Wildfire Protection Plan (CWPP) is based on the collaboration of the participating stakeholders (Plan Partners) and the many Humboldt County residents who were part of this process through attending a public workshop and/or commenting on drafts of the plan. Based on this collaboration, and the analysis reported in Parts I and II of this CWPP, the following action plan was developed for Humboldt County.

Within **Part III. Countywide Action Plan,** action plan topic areas are introduced, a set of action items is identified for each topic, and the lead organizations and/or Plan Partners involved in implementation are listed. The action items are then ranked in terms of short (1 – 2 years), medium (2 – 5 years), long (5 – 10 years), or ongoing implementation priority; ease of implementation is also indicated when applicable.

- Action items are identified with this indented arrow (and written in italics) throughout this chapter. They are followed by the implementer(s) of the action item (written in standard type), and the implementation priority (in parentheses, standard type and **bold**): **"S"** (short), **"M"** (medium), **"L"** (long), and/or **"O"** (ongoing). In addition, a **"✋"** indicates those items that will be relatively easy to implement, or have already been initiated or completed.

Members of the Humboldt County Fire Safe Council (HCFSC) collaboratively discussed and prioritized these action plan topics in the order of perceived importance. The results of this exercise identified the following as the action plan topics of greatest importance: 1) "Enhancing Fire Protection: Helping Firefighters Protect the Community;" 2) "Encouraging and Implementing Defensible Space Throughout Humboldt County;" and 3) "Creating Fire-Safe Communities: Empowering Residents to Take Responsibility." According to the knowledge and expertise of HCFSC members, these three topics represent the most significant areas for action in strengthening Humboldt County's fire preparedness. Following these items, many of the remaining topic areas ranked similarly in level of importance. The results of this prioritization exercise will help guide the HCFSC in the implementation of this CWPP.

The following lists the action plan topics in priority order, according to the HCFSC prioritization exercise:

1. Enhancing Fire Protection: Helping Firefighters Protect the Community
2. Encouraging and Implementing Defensible Space Throughout Humboldt County
3. Creating Fire-Safe Communities: Empowering Residents to Take Responsibility
4. Promoting Fire-Safe Education
5. Implementing and Maintaining this CWPP
6. Reducing Hazardous Fuels Throughout Humboldt County
7. Preparing Humboldt Communities for Emergencies
8. Ensuring Safe and Effective Evacuation
9. Hardening Homes to Survive Wildfire: Reducing Structural Ignitability
10. Enhancing Emergency Notification and Communications
11. Designating Wildland-Urban Interface Areas
12. Utilizing Excess Fuels
13. Maintaining Air Quality
14. Integrating Fire-Safety Actions with Local Regulations and Policy
15. Designating Communities at Risk

In an ideal world, everything recommended here would be implemented expeditiously. Although it is the intention of CWPP authors and signers that all action items in this document be implemented as appropriate, it will happen subject to the availability of funds and other resources and the willingness and ability of community members and Plan Partners to take action.

III.1. Enhancing Fire Protection: Helping Firefighters Protect the Community III-1
III.1.1. Improving the Level of Service of Fire Protection III-1
III.1.2. Securing Resources for Fire Protection III-2
III.1.3. Developing a Reliable Revenue Source for Fire Protection III-3
III.1.4. Ensuring Adequate Water Supplies for Fighting Fire III-4
III.1.5. Improving Road and Home Address Signage III-5
III.2. Encouraging and Implementing Defensible Space Throughout Humboldt County III-6
III.2.1. Implementing Community Defensible Space and Fuel-Reduction Programs III-7
III.3. Creating Fire-Safe Communities: Empowering Residents to Take Responsibility III-8
III.3.1. Creating and Sustaining Fire Safe Councils III-8
III.3.2. Creating and Sustaining Firewise Communities III-9
III.3.3. Creating Local CWPPs III-10
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III.1. Enhancing Fire Protection: Helping Firefighters Protect the Community

Local fire departments in Humboldt County have been created from the desires of local communities to protect themselves. Fire departments have a history of working collaboratively, and have regularly assisted each other to better protect their communities. A good example of such inter-departmental cooperation is the Humboldt County Fire Chiefs' Association (Fire Chiefs). There are, however, significant disparities existing in the levels of fire protection available to Humboldt County communities. These disparities are due to many factors, including: whether or not the community has a fire-related *special district*; when such a district was formed; the value of the local tax base; and the recruitment and availability of volunteers.

Compared to other counties in California of similar size and population, Humboldt County has an exceptionally high number (42) of local organizations providing fire protection. The establishment and operation of multiple fire organizations has occurred in response to the rural, isolated development patterns (geographical separation) over the last century in the unincorporated regions of the county.

As rural communities grow, distances between them are reduced and the opportunity for sharing services increase. This is evident in the number of *mutual-aid agreements* that exist throughout the county.[1] Consolidating resources is one technique that has been used in other localities to more efficiently provide fire-protection capabilities.

For more information on fire protection in Humboldt County, please see Chapter II.3. Wildfire Protection Capabilities.

- *Facilitate the consolidation, expansion, or formation of special districts that provide fire protection services to ensure adequate and sustainable community fire protection for al residents in Humboldt County.* —Fire Chiefs, Humboldt County Fire Safe Council (HCFSC), Local Agency Formation Commission (LAFCO), Humboldt County Board of Supervisors (BOS) **(M, O)**
- *Identify strategies to provide a support network for fire service agencies and organizations via improved communication and coordination.* —HCFSC, Fire Chiefs **(S)**
- *Educate community members regarding how they can support their local fire department, including helping with fundraisers, grant writing, reporting, paperwork, or becoming e a volunteer firefighter.* —Fire Chiefs, Local Fire Organizations, HCFSC **(O)**
- *Develop an administrative support structure to assist local fire organizations with incident reporting.* —Fire Chiefs, Local Fire Organizations, HCFSC **(M)**

III.1.1. Improving the Level of Service of Fire Protection

There is a significant difference between the Level of Service (LOS) available to residents in urban areas of the county (e.g. Eureka), and residents living in more remote rural areas. Local fire departments use formal and informal mutual-aid and *automatic-aid agreements* to augment provided levels of protection, yet LOS differences between communities persist. The Fire Services Annual Report, produced by the Fire Chiefs and presented to the BOS each year, is a useful tool for identifying where these LOS differences exist and for increasing awareness among elected officials and the public about who provides local community fire protection, what services they are able to provide, and the level of volunteer effort needed to sustain the service.

The LOS standard is important for the following reasons: 1) an established standard will improve the ability of real estate professionals, public safety personnel, and government officials to inform landowners and residents of the available level of fire protection; 2) it will support fire department grant requests to local, state, and federal

[1] *See Chapter II.3. Wildfire Protection Capabilities for more information on local mutual-aid agreements.*

funding sources for purchase of apparatus, equipment, and training in order to meet standards; and 3) it will allow local governments to effectively plan for municipal service delivery and population growth.

However, bringing the LOS up to an established standard may present a challenge for some of the smaller departments. In addition Insurance Services Office (ISO) classifications may be influenced based on changes in service delivery and disclosure. ISO establishes fire insurance ratings for Humboldt County communities that influence how much property owners pay for fire insurance. Improvements in service could result in reduced insurances rates but disclosure about a low LOS could increase rates.

An HCFSC committee continues to work closely with the Fire Chiefs to identify and agree on a minimum LOS standard. The standard will need to be tiered, acknowledging that there are different expectations and capacities in rural, suburban, and urban environments. It has been determined that training level standards are the most critical focus area to begin this effort. The Fire Chiefs liaison to the HCFSC will continue to identify areas of needed collaboration.

- *Develop LOS standards for the provision of all fire protection services (fire, emergency medical service (EMS), Hazardous Materials (HazMat), rescue) in the county, and make such standards public so that landowners and residents understand what is and is not available to them.* —Fire Chiefs, HCFSC LOS Standards Committee **(S)**
- *Work collaboratively to ensure that the Fire Services Annual Report continues to be produced, presented to the BOS, and made available through the HCFSC and Fire Chiefs websites each year.* –Fire Chiefs, CAL FIRE, HCFSC.
- *Develop LOS standards related to training.* —Fire Chiefs, HCFSC LOS Standards Committee **(S)**
- *Establish minimum levels of fire protection service for Humboldt County communities.*—Fire Chiefs, Individual Fire Departments **(O)**

III.1.2. Securing Resources for Fire Protection

The lack of essential training and equipment, and difficulty in recruiting volunteers are issues throughout the county. The development of fire and emergency services training facilities is critical to the delivery of emergency services. Humboldt County firefighters have varying and sometimes inadequate levels of training. Recognizing that approximately 92% of Humboldt County firefighters are volunteers—many of whom live in outlying areas—multiple and/or mobile training facilities may be required to support countywide training programs. Providing all firefighters with necessary training will result in a more confident, capable, and reliable fire-fighting force prepared to deliver improved service to the citizens of the county. Fire departments report that it is sometimes impossible to attract and retain adequate numbers of qualified volunteers. Addressing these fire protection resource-training issues is essential to local firefighters in meeting an established LOS standard.

Equipment in many, if not most, of the local fire protection organizations is generally antiquated. Much of it is "hand-me-downs" several times over.

- *Establish regional fire-training facilities in appropriate locations. Facilities should include classrooms, a burn tower, and fire and rescue training props.* —Fire Chiefs, HCFSC, California Department of Forestry and Fire Protection (CAL FIRE), Federal Agencies **(M)**
- *Establish regular fire-training programs/classes at the local level throughout the county to serve different regions: i.e., southern, north-eastern, and northern Humboldt, Eel River Valley, Humboldt Bay, etc.* —Fire Chiefs, HCFSC, CAL FIRE, Federal Agencies **(M)**
- *Collaboratively identify strategies to provide improved training and equipment to local fire departments and develop formal mutual-aid agreements between departments providing fire protection in Humboldt County.* —Fire Chiefs, CAL FIRE, Federal Agencies, HCFSC **(S)**

- *Ensure that all first responders have adequate training and equipment*—Fire Chiefs, CAL FIRE, Federal Agencies, HCFSC **(S)**

III.1.3. Developing a Reliable Revenue Source for Fire Protection

Through this Community Wildfire Protection Plan (CWPP) update process, it was emphatically confirmed that a lack of adequate funding is still one of the most critical issues facing local fire service. Some departments indicate that revenue is insufficient to cover even the basic costs of operation and administrative tasks. Personnel-related costs such as workman's compensation—even in all-volunteer departments and with support from the County—have increased many times faster than the growth of revenue. Proposition 13 and subsequent changes to the State Constitution have made it extremely challenging for local agencies to increase taxes for fire protection, and fundraising by all-volunteer departments is difficult and time-consuming. Moreover, the impact of additional occupational safety requirements mandated by Senate Bill (SB) 1207, no matter how critical to firefighter safety, could be "the straw that breaks the camel's back" in terms of departmental survivability.

To maintain capable fire protection, it is important to establish adequate and reliable revenue sources for local fire departments as well as innovative cost-sharing programs to increase the efficiency of service provision. The most stable sources of revenue for fire protection are ongoing assessments and recurring agency programs. One-time funding (such as grants) can be effective for establishing a program or service, but must be replaced by an ongoing source for long-term viability. The variety of methods by which local fire departments are organized, and the funding sources that are available to each type of department, makes identifying "one size fits all" funding solutions very difficult.

A special circumstance of fire protection need lies in areas of the county where there is no obligated service provider. Currently, these unprotected areas may receive "*goodwill service*" from nearby fire departments. However, these departments are not compensated for this goodwill service and it represents an additional strain on their already overburdened resources. A countywide funding strategy could mitigate this type and other types of service delivery problems.

- *Develop reliable sources of ongoing funding for fire protection districts and departments, such as revenue exchange agreements, benefit assessments, mitigation fees, and user fees.* —Local governments, Fire Chiefs, HCFSC Revenue Source for Fire Protection Committee, Local Foundations **(M, O)**
- *Provide technical support to local organizations that seek to establish (tax) benefit assessment areas as well as alternative funding mechanisms. Coordinate with state/federal government funding programs (e.g., Amador) as sources of funding for community fire protection.* —Fire Chiefs, HCFSC Revenue Source for Fire Protection Committee, LAFCO **(S, O)**
- *Encourage the provision of fire protection services through a district or local agency that provides a stable source of revenue from property tax, assessments, fees, or other sources.* —HCFSC, County of Humboldt, LAFCO, Fire Chiefs **(S, O)**
- *Provide guidance to local special districts regarding how to ground-truth and update local tax rolls to reflect new developments in order to capture the additional revenues they are due through benefit assessments or special taxes.* —Fire Protection Districts, Fire Chiefs, County Assessor, HCFSC Revenue Source for Fire Protection Committee, Humboldt County Planning and Building **(S)**
- *Support local fire departments with funding and countywide coordination for training, equipment, and improved communications.* —Fire Chiefs, HCFSC Revenue Source for Fire Protection Committee, Local Foundations **(O)**
- *Support the continued allocation of a portion of Proposition 172 funds to local fire agencies.* —BOS **(O)**

III.1.4. Ensuring Adequate Water Supplies for Fighting Fire

Water is critical for successful firefighting and is used for suppressing both structural and wildland fires as well as protecting homes from ignition from wildfire. Both the County and California's minimum firefighting water requirement (for developments that are not on a hydrant system) is 2,500 gallons of accessible water. Rural residents ideally would have up to 10,000 gallons of available water for fire protection. *(See Part V. Fire-Safe Communities, for more information on water storage options.)*

Several areas within the county are lacking in sufficient water for fighting fire. Those communities with water system issues for adequate fire protection and suppression are identified in the Planning Unit Action Plans in Part IV of this CWPP.

Most large wildfires occur in Humboldt County in late summer and/or early fall when water levels in local rivers and streams can be very low. Conflicts have arisen in the past over *bucket dipping* and water *drafting* out of rivers for firefighting water during late summer when native salmon and steelhead and their habitat is most vulnerable.

- *Install water tanks that are accessible for fighting fire. Fill the tanks in the winter (use the Sanctuary Forest[2] forbearance program as a model).* —Humboldt County Residents, Fire Safe Councils (FSCs), Neighborhood and Homeowners Associations **(S, O)**
- *Make sure existing and future water tanks have proper fittings for fire hoses.* —Humboldt County Residents, Fire Prevention Officers, Fire Chiefs, Local FSCs **(S, O)**
- *Highlight potential for less bucket dipping and water drafting in critical fish habitat during incidents (which often occur at critical times for salmonids).* —Watershed Organizations, Fire Chiefs, Tribes, CAL FIRE, Six Rivers National Forest (SRNF), HCFSC, California Department of Fish and Game (DFG) **(O)**
- *Work with wildfire managers to increase the use of fish screens on water tenders, water pumps, and other pumping devices during large wildfire events.* —Watershed Organizations, Fire Chiefs, Tribes, CAL FIRE, SRNF, HCFSC, DFG **(O)**
- *Design a program to educate residents about how to properly set up water tanks/sources for use by firefighters.* —Fire Chiefs, Local Fire Departments, CAL FIRE, Local FSCs **(S, O)**
- *Secure funding to design and implement a countywide Blue Dot Program[3]; providing information and materials for installing reflective blue dots and sign*s*, identifying the location of water for use by firefighters.* —HCFSC, Local FSCs, Fire Chiefs **(S, O)**
- *Create a handout similar to Mendocino County FSC "Developing Water Supplies for Fire Protection"[4] and Humboldt #1 Fire Protection District handouts.* —HCFSC, Fire Prevention Officers, County Panning and Building **(S, ✋)**
- *Educate rural residents on the needs and benefits of water storage (tanks, ponds, water bladders…).* — HCFSC, Humboldt Resource Conservation District (HRCD) Watershed Councils, Other Interested Partners **(S, O)**
- *Encourage RAC[5]-funded program to place water storage tanks for fire protection on lands adjacent to federal lands, especially in the areas of Orleans, Weitchpec, Willow Creek, Titlow Hill, and Dinsmore (Forest Service*

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[2] Sanctuary Forest. (n.d.). *Sanctuary Forest's Mattole Flow Program: Water Storage and Forbearance.* Retrieved September 9, 2012 from www.classic.mattole.org/website_updates108/FINAL_brochure_text_1207.pdf

[3] *See Part V. Fire-Safe Communities for more information on Blue Dot Programs.*

[4] Mendocino County Fire Safe Council. (2012). *Developing Water Supplies for Fire Protection.* Retrieved from http://firesafemendocino.org/pdf/Water%20Supplies%20for%20Fire%20Protection%204%20pages.pdf

[5] Six Rivers National Forest, Resource Advisory Committee (RAC).

adjacency) and Whitethorn, Shelter Cove, Honeydew, and Prosper Ridge (Bureau of Land Management (BLM) adjacency).[6] —HCFSC, SRNF, BLM, Local Fire Departments **(M)**

- *Explore funding for a water-storage program (tanks, ponds, water bladders, water tenders…) for rural areas, especially on private lands not adjacent to federal lands, in all communities in the State Responsibility Area (SRA) not mentioned above and not already on a public or private community water system. Prioritize areas of High and Very High Fire Hazard Severity zones.* —HCFSC, CAL FIRE, Fire Chiefs, Federal Agencies, Local Foundations **(M)**
- *Identify and pursue solutions to overcome barriers to installing water tanks, ponds, and water bladders for fire suppression efforts (permit costs, increased taxes, etc.).* —HCFSC, CAL FIRE, Fire Chiefs, County Planning and Building, Watershed Councils, DFG **(M)**

III.1.5. Improving Road and Home Address Signage

Throughout the county, firefighters and other emergency personnel are faced with the challenge of finding homes quickly and safely during an emergency. The importance of clearly posted address signs for ensuring timely response from emergency personnel cannot be overemphasized to property owners. At a minimum, existing city and county *standards* that require streets and homes to be visibly addressed must be enforced. These standards require the size of lettering on these signs to be three inches high, with a contrasting backing, and in accordance with the California Building Code.

Difficulty locating the site of an emergency can be exacerbated by the use of several different names by members of the public to identify the same road or street. Some specific problem areas include Highway 211/Ferndale Highway, and Wilder Ridge/Mattole Road/Bull Creek Road. Posting only standardized road names and encouraging emergency responders and dispatchers to use these standardized descriptions during emergencies could help curb this problem.

- *Develop a program that promotes and provides resources for installing more road name signs and home address signs with a particular emphasis on educating residents about the importance of posting and maintaining such signage.* —Humboldt County Public Works, Humboldt County Sheriff's Department, Fire Chiefs **(M)**
- *Officially name roads so all use the same name, beginning with priority roads including: Bull Creek, Mattole Road, and Wilder Ridge.* —County Public Works, County Planning and Building (GIS),[7] County Sheriff's Department, CAL FIRE Dispatch Center, Battalion Chiefs, Local Fire Departments **(M)**
- *Standardize County mile-markers along rural roads to assist emergency responders' ability to locate incident sites quickly and efficiently.* –Humboldt County Public Works, Road Associations, County Planning and Building (GIS)
- *Create map books with home addresses for fire departments. This "Fire Atlas" could also include water sources, access routes, safety zones, and whatever other resources that can be gathered. Use the Lower Mattole FSC Atlas as an example.* —Fire Chiefs, CAL FIRE, County Planning and Building (GIS), County Public Works **(M)**
- *Create a handout for residents (with photos) regarding the importance of, and how to effectively post, home-address signs. Distribute with building permits and at community events.* —County Planning and Building, County Public Works **(S, O)**

[6] For an example of a successful program, contact the Del Norte Fire Safe Council; telephone: 707-951-1116; email: dnfsc@charterinternet.com.

[7] Geographic Information Systems (GIS)

- *Collaborate to enforce existing signage requirements for streets and residences.* —CAL FIRE, Local Fire Departments, County of Humboldt, Cities **(M, O)**
- *Explore incentives for private road and address signage conformance, including public education.* —HCFSC, Local FSCs, Local Fire Departments, Homeowners Associations **(M)**
- *Review local information on Google Maps (and other popular internet mapping sites) to facilitate correction of road naming errors.* —County Planning and Building (GIS) **(S, O)**

III.2. Encouraging and Implementing Defensible Space Throughout Humboldt County

Defensible space works; hence it is the law in California. Defensible space is also known as the *Home Ignition Zone*.[8] Others prefer the term *survivable space*, as it's all about surviving, or living with wildfire.

> "If homes are sufficiently resistant to ignition and do not ignite during the extreme wildfire exposure, then the homes survive without firefighter protection: we have an extreme wildfire but not a WUI[9] fire disaster. Thus, WUI fire disasters principally depend on home ignition potential.
>
> Research shows that a home's ignition potential during extreme wildfires is determined by the characteristics of its exterior materials and design and their response to burning objects within one hundred feet and firebrands (burning embers)."[10]

In Humboldt County, one of the principal wildfire hazards threatening residents is the abundance of *hazardous fuels* in the Home Ignition Zone—the vegetation and other flammable items found closest to homes. As shown in Part V of this CWPP, the most effective wildfire survival strategy for residents within the *wildland-urban interface* (WUI) is to ensure that homes and the surrounding Home Ignition Zone are adequately prepared to survive wildfire. A well-managed Home Ignition Zone 1) increases home survivability during a wildfire event; 2) protects the wildlands from fire originating in the home; and 3) acts as a safe-anchor point from which firefighters can safely protect the home from an approaching wildfire. Wildfire does not have to be a disaster. It is possible to prepare for wildfire to minimize negative impacts.

> "Preventing WUI fire disasters requires that the problem be framed in terms of home *ignition potential*. Because this principally involves the home ignition zone, and the home ignition zone primarily falls within private ownership, the responsibility for preventing home ignitions largely falls within the authority of the property owner. Preventing wildfire disasters thus means fire agencies helping property owners mitigate the vulnerability of their structures."[11]

The following statement from the California Attorney General's office from 1964 provides the legal framework for local governments to take action to ensure fire safety:

> "The Legislature of the State of California hereby finds and declares that the unrestricted use of grass-, grain-, brush-, or forest-covered land within the State is a potential menace to life and property from fire and resulting erosion…. Counties, cities and counties, cities, and districts may adopt ordinances, rules, or regulations to provide fire prevention hazard conditions."[12]

Furthermore, the *Humboldt Operational Area Hazard Mitigation Plan* (HMP) identified "Create and maintain defensible space around structures" as a Mitigation Alternative for Wildfire.[13]

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[8] *See Part V. Fire-Safe Communities, for more information on the Home Ignition Zone.*

[9] Wildland-Urban Interface (WUI).

[10] Cohen, Jack. (2008). The wildland-urban interface problem–A consequence of the fire exclusion paradigm. *Forest History Today, Fall 2008*. (p. 23.) Retrieved from www.foresthistory.org/Publications/FHT/FHTFall2008/Cohen.pdf.

[11] Cohen, Jack. (2008). The wildland-urban interface problem–A consequence of the fire exclusion paradigm. (p.25.)

[12] Stanley Mosk, Attorney General. (2000, April). *Structural Fire Prevention Field Guide, Appendix F.* Office of State Fire Marshal.(pp. F-2--F-3.) Retrieved from http://cdfdata.fire.ca.gov/pub/fireplan/fpupload/fppguidepdf92.pdf.

[13] County of Humboldt, Natural Resources Planning. (2008). Chapter 21: Mitigation Alternatives. (Table 21.9)

For more information on defensible space, please see Part V. Fire-Safe Communities.

- *Coordinate countywide and community-specific efforts to focus on a defensible-space "from the house out" strategy, empowering Humboldt County residents to take responsibility for maintaining fire-safe Home Ignition Zones.* —Plan Partners, Local FSCs, Local Fire Departments, Homeowners Associations, Humboldt County Residents **(S)**
- *Implement defensible space around all structures, and on all residential parcels within the county.* —Humboldt County Residents, Local FSCs **(S, O)**
- *Work together to provide information and resources to help residents create defensible space around their homes and in their neighborhoods.* —HCFSC, Local FSCs, Plan Partners **(S,)**
- *Explore incentive programs to help residents create defensible space around their homes and in their neighborhoods*. —HCFSC, BOS, Plan Partners **(M)**
- *Coordinate conservation and fire-safety objectives in educational programs, including promoting options for conserving water, and incentives to replace exotic plants with native species*. —Local FSCs, Watershed Councils, California Native Plant Society, Local Conservation Organizations, University of California Cooperative Extension (UCCE), Water Districts **(O)**
- *Work with the local insurance industry to provide education on appropriate local fuel-reduction practices, and materials for them to share with policyholders.* —HCFSC **(S)**

III.2.1. Implementing Community Defensible Space and Fuel-Reduction Programs

Residents have the primary responsibility in ensuring they have defensible space around their homes and properties. As stated above, it's not only the law—it makes sense. In some cases however, residents are unable to do this themselves, whether for physical, financial, or other reasons. Community-based programs can facilitate creation of defensible space for these vulnerable populations.

The HCFSC was awarded grant funds in 2010 and again in 20012 to conduct a pilot program called the "Firesafe Homes and Forests Cost Share Program," known locally as the *Fire-Adapted Landscapes and Safe Homes* (FLASH) *program*. The program is funded by Title III and the USFS, and is being managed by Humboldt's Natural Resources Planning Division, in conjunction with local FSCs and interested property owners. The FLASH program is targeted to the following communities: Orleans, Willow Creek and Redwood Valley, Southern Humboldt, Van Duzen, and Mattole. These communities have active Fire Safe Councils to manage the program locally, as well being areas of high and very high fire hazard. FLASH provides a cost-share match to landowners working with a local FSC to implement fuel-hazard reduction activities. Through FLASH, hazardous vegetation on slightly over 311 acres of land was treated to date, to reduce the wildfire risk for homesteads and access routes. A total of 114 landowners completed work on their property through this program. The goal of the 2012 program is to treat 200 more acres.

Programs targeted at assisting residents to join together to make their neighborhoods fire-safe can also be very successful. This is especially important where parcels with absentee owners abut residential parcels. In some communities, neighboring residents have contacted these owners to get permission to clear these neighboring properties in order to increase defensible space around their own homes.

Community *chipping programs* are in place throughout California to allow residents to share in the use of a chipper to dispose of cut branches and other materials. FSCs and homeowners associations can organize their neighborhoods to schedule chipping regularly, based on models developed by other FSCs statewide, especially in neighboring North Coast communities.

Humboldt Operational Area Hazard Mitigation Plan; Volume 1 – Planning Area-Wide Elements. Retrieved from http://www.co.humboldt.ca.us/natural-resources/hazardmitigation/?inc=finaldraft

For more information on hazardous fuels, please see Chapter II.1. Wildfire Environment, and Part V. Fire-Safe Communities.

- *Seek continued funding for the FLASH program.* —HCFSC **(S, O)**
- *Work with neighbors, and on neighboring properties (with owners' permission) to create neighborhood-wide defensible space.* —Humboldt County Residents **(S, O)**
- *Work together to develop programs to create defensible space for elderly and disabled residents who are not able to do this for themselves.* —HCFSC, Plan Partners, Social Services, Senior Centers, Schools, Other Community and Social Service Organizations **(S, O)**
- *Develop community-chipping programs to assist residents in disposing of thinned materials.* —Local FSCs, CAL FIRE, Land Management Agencies, Federal Agencies **(M)**

III.3. Creating Fire-Safe Communities: Empowering Residents to Take Responsibility

There are several concepts used today that mean essentially the same thing: fire-safe, fire adapted, and fire wise. All three terms are used to describe communities, neighborhoods, projects, etc. that are designed and prepared to increase the probability of surviving wildfire. We use the term "fire-safe" in this document, with the understanding that all three terms are virtually interchangeable.

For more information on community fire preparedness in Humboldt County, please see Chapter II.4. Community Preparedness.

- *Support Humboldt County residents with information, education, and resources to take responsibility for their fire safety.* —Plan Partners **(S, O)**

III.3.1. Creating and Sustaining Fire Safe Councils

The effective functioning of FSCs and related community-based organizations in Humboldt County is critical to creating fire-safe communities. These groups play an integral role in implementing many of the measures discussed in this CWPP, including fuel-reduction projects, supporting the efforts of fire departments, and educating community members regarding living safely with fire.

Through the collaborative processes of the HCFSC and the six local FSCs in Humboldt, various partners have come to the table to implement fuel-reduction and fire-safety projects. **It will be members of these FSCs and associated community organizations such as homeowners associations, watershed groups, and community centers that will ultimately determine the effectiveness and success of this countywide CWPP**. Hence, ongoing support for and participation in FSCs is fundamental both for their development and for the success of local fire-safety efforts.

Based on the positive feedback from residents at the CWPP community workshops, there is a committed interest to organize locally to create fire-safe neighborhoods and communities in Humboldt County. The missing piece is often a solid organizational structure and a strategic plan for these groups to be able to effectively function over the long term (*see III.3.3. Creating Local CWPPs below for more information on supporting local FSCs*).

The Community Preparedness chapter of the Risk Assessment introduces existing FSCs that already provide community fire-safety leadership. These existing FSCs can serve as an example and provide support to emerging FSCs and to one another. At the 2012 community workshops the following communities expressed interest in creating a local FSC: Redwood Valley, Westhaven, Orick, and the Hoopa Valley and Yurok Indian Reservations.

- *Form new FSCs (especially in Redwood Valley, Westhaven, Orick, and the Hoopa Valley and Yurok Indian Reservations) to coordinate local community wildfire preparedness efforts.* —Neighborhood Groups, Homeowners Associations, HCFSC, CAL FIRE **(S, O)**

- *Form a committee of the HCFSC to conduct outreach to and provide ongoing support for communities that currently do not have a local FSC.* —HCFSC **(S, O)**
- *Support the continuation of and maintenance of revenue sources for the HCFSC and determine the best organizational structure to further countywide wildfire mitigation efforts.* —HCFSC, BOS, CAL FIRE, Federal Agencies, Tribes, Fire Chiefs, Local FSCs, Other Plan Partners **(S, O)**
- *Work with local FSCs to develop ongoing financial and in-kind support (including organizational development, technical support, grant writing support, fundraising, and training) to ensure their long-term sustainability and autonomy.* —Public and Private-Sector Organizations, Local Foundations (including Humboldt Area Foundation and McLean Foundation), County of Humboldt, Humboldt County Residents **(S, O)**
- *Encourage and facilitate collaboration on grant proposals. (Maintain current list of funding sources and contact information for interested partners; provide example applications of successful proposals.)* —HCFSC, Local FSCs, CAL FIRE, Partner Agencies and Organizations **(S, O)**
- *Organize an annual FSC capacity-building workshop to help inspire new FSCs and sustain existing ones.* —HCFSC, Local FSCs, County of Humboldt, California FSC, CAL FIRE, Partner Agencies and Organizations **(S, O)**

III.3.2. Creating and Sustaining Firewise Communities

Several Humboldt County communities have gained *Firewise* recognition in the past few years for the steps they have taken to address wildfire hazards. Becoming a Firewise Communities/USA site has helped these communities get organized and find direction for their wildfire safety efforts and potential funding sources. As community members go through the Firewise process, they learn about existing *wildfire risks* in their community and the simple things they can do to reduce those risks.

The Firewise program in Humboldt County pairs nicely with the development and implementation of local CWPPs. Communities are using their Firewise Assessment to focus on particular subsets of their CWPP planning area. They are identifying short-term, *site-specific* activities for their annual Firewise Action Plans. This helps them to focus the implementation of their longer term CWPP Action Plans; (CWPPs often have a 5-year update cycle whereas Firewise action plans are evaluated annually). In areas not covered by a local CWPP, the Firewise program is a good tool to inspire action when the development of a local FSC and/or CWPP seems infeasible and or overwhelming. The Firewise process is significantly less involved than the development of a CWPP and the focus can be predominately on needed actions within the *Home Ignition Zone*[14] rather than the community as a whole. There may also be County Title III[15] funding available for Firewise-related activates.

At the 2012 community CWPP workshops the following communities expressed interest in the Firewise program: Kneeland, Redwood Valley, and Fieldbrook.

- *Support local FSCs and other community organizations to complete the process of becoming recognized Firewise Communities/USA sites (especially in Kneeland, Redwood Valley, and Fieldbrook).* —Public and Private-Sector Community Organizations, Local FSCs, HCFSC, County of Humboldt, CAL FIRE **(S, O)**
- *Support local FSCs and other community organizations to implement actions identified in their local Firewise Action Plans*. —Public and Private-Sector Community Organizations, Local FSCs, HCFSC, County of Humboldt, CAL FIRE **(S, O)**

[14] *See Part V. Fire-Safe Communities for more information on the Home Ignition Zone.*

[15] Secure Rural Schools and Community Self-Determination Act. (2000). *Title III, County Funds.* Retrieved from http://www.fs.usda.gov/pts.

III.3.3. Creating Local CWPPs

A CWPP is a guiding document designed to inspire action that will reduce the vulnerability of communities to losses from wildfire. This countywide CWPP is a valuable tool to that end. Its focus is at the county scale. More detailed localized planning documents are also needed. The Planning Unit Action Plans (PUAPs) in Part IV of this CWPP are a step in that direction. An action plan has been developed for each of thirteen CWPP planning units *(see Part IV and associated maps)* The PUAP s contain a background description of each area, including the local fire environment, potential evacuation routes and sites, and information gathered from the respective community workshop. **The PUAPs identify a set of actions that community members can take themselves to make their homes and neighborhoods fire safe.** Finally, the PUAPs can function as the basis for an operating plan for local FSCs and related groups, and eventually for a more in-depth local CWPP.

Several local FSCs have already created a local CWPP or are in the process of developing one. The Lower Mattole FSC (through the Mattole Restoration Council) developed the first local CWPP in the county in 2002, and has already gone through one CWPP update process (2012). The Willow Creek CWPP was completed in 2010. The Orleans Somes Bar CWPP has been in development for many years, and was approved in early 2012. The Upper Mattole CWPP (2004) is being incorporated into the Southern Humboldt CWPP, which is in the process of development and is due for completion in 2012. In addition, the Van Duzen Watershed FSC and the Hoopa and Yurok Tribes are in the process of drafting their first local CWPPs.

Mapping wildfire risks, hazards, and potential actions is an integral part of any CWPP. The proficiency of local FSC members with Geographic Information Systems (GIS) and other mapping and planning technologies is highly variable. Local FSC staff and/or volunteers may need individual training and assistance in order to increase their pre-fire planning skills. The County of Humboldt has GIS specialists and a fire planner on staff that can help local FSCs complete and manage their CWPPs and accomplish fire-plan goals for community wildfire preparedness.

- *Encourage communities to use the PUAPs of this CWPP as the basis for the development of local CWPPs.* —HCFSC, County of Humboldt, CAL FIRE **(M, O)**
- *Use the PUAPs of this CWPP as a source of direction and inspiration for taking action at the neighborhood and community level.* —Local FSCs, Community Organizations, Humboldt County Residents **(S, O)**
- *Share relevant GIS data with existing and emerging FSCs to aid in their wildfire mitigation planning efforts.* —County Planning and Building (GIS), CAL FIRE **(S, O)**

III.3.4. Working Together to Reduce Wildfire Starts

As shown in the Wildfire Environment chapter of this CWPP, well over half of the wildfires in Humboldt County are started by people; usually, but not always, by accident.[16]

Several local fire departments, CAL FIRE, and the SRNF conduct fire prevention outreach. The Fire Prevention Officers Section of the Fire Chiefs brings together the fire prevention officers of fire departments throughout the county to address fire prevention issues and ensure clear understanding of current law. Department prevention officers provide public education in schools, at fairs and other events including during fire prevention week. CAL FIRE and SRNF maintain active fire safety education programs. Their public education-related prevention tasks include the use of fire danger ratings, involvement in FSCs, and involvement in various public events.

Ironically, one source of wildfire is the equipment used during *fuel reduction* activities. For this reason there are guidelines in terms of when and how to clear fuels, such as early in the morning and well before fire season. However, extra care must be taken when reducing fuels in the spring, as this is when ground-nesting birds are in their nests, and many native perennials are blooming. *Please see Part V. Fire-Safe Communities for details*

[16] *See Figure II.1-14.Wildfire Starts Map in Chapter II.1. Wildfire Environment.*

regarding how to safely reduce fuels and Chapter II.4. Community Preparedness, for information about prevention programs.

"Party spots" are another source of wildfires, places where young people may not be fully aware of the consequences of their actions. Reducing fuel in these areas and encouraging neighborhood education and patrols can help reduce the risk of fire starts in those places.

- *Get GIS coordinates of high-risk areas such as party spots that were identified at community workshops to facilitate fuel reduction and neighborhood monitoring.* —Local FSCs **(M, O)**
- *Use Work Alternative Program crews of local youth for fuel reduction in high-risk areas.* —Local FSCs, County Sheriff's Department **(M, O)**
- *Educate local residents regarding fire-safe fuel reduction techniques to minimize fire starts.* —Fire Prevention Officers, Local FSCs **(S, O)**

III.4. Promoting Fire-Safe Education

This CWPP recognizes that effective fire-safe education programs are one of the most successful ways to reduce fire risk and to minimize losses due to fire. The Fire Chiefs' Fire Prevention Officers and local FSCs have both been working diligently for some time to address citizen fire-safe education. There is still a need however for more coordination between fire-prevention and fire-planning organizations in the delivery of fire-safety education throughout the county. Rural landowners especially could benefit from an increased understanding of defensible space, fire-safe construction, home fire prevention, evacuation preparedness, how to most effectively call 911, etc. There are no countywide standards for school- or community-based fire safety education programs—such standards would support overall fire-safe education efforts. Finally, there is a need to improve citizen's understanding of prescribed fire as a fire prevention tool.

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

For more information on fire-safe education, please see Part V. Fire-Safe Communities.

- *Provide fire-safety education to residents, and the homebuilding, insurance, real estate, landscaping, and building-supply industries. Include information about non-combustible roof coverings, fire-safe construction for high fire risk and/or hazard areas, techniques for reducing flammability in home ignition zones, adequate emergency water supplies, address and road identification and signage, access, road clearances, and emergency evacuation procedures.* —Fire Prevention Officers with FSCs **(S, O)**
- *Design, publish, and distribute a Humboldt County version of "Living with Fire," a newspaper insert that provides information about how to safely coexist with wildfire.* —Fire Prevention Officers, HCFSC, Local FSCs **(S)**
- *Create an educational guide for how to construct an effective shaded fuelbreak (based on information provided in Part V. Fire-Safe Communities of this CWPP).* —HCFSC **(S)**
- *Create educational guides for how to create effective defensible space around homes in Humboldt County.* —HCFSC, Fire Prevention Officers **(S)**
- *Develop Humboldt County fire-safety posters and displays to use at public events; take advantage of all possible opportunities to display them at local events.* —HCFSC, Fire Prevention Officers, Local FSCs **(S)**
- *Ensure that all local fire departments have access to quality educational materials that can be handed out at their fundraising events.* —CAL FIRE, Fire Prevention Officers, HCFSC **(S, ✋)**
- *Offer public workshops to educate and train residents in how to manage their vegetation to reduce their wildfire hazard while protecting ecological health and/or economic productivity.* —HCFSC, UCCE, Local FSCs, Fire Prevention Officers, Watershed Groups, Local Conservation Organizations **(M)**

- *Use social networking sites to promote fire safe education.* —HCFSC, Fire Prevention Officers, Local FSCs **(S)**

III.4.1. Incorporating Fire-Safety Education into Local Schools

Educational programs in the local schools are a great way to get the word out about fire safety and emergency preparedness. Several curricula exist that would need minimal adjustments to be used in Humboldt County. For instance, the Butte County FSC has developed a successful 6th grade curriculum titled, "Wildfire in the Foothills." Persons interested in adapting this curriculum for use in their own community may contact the Butte County FSC through this website: http://www.thenet411.net/index.php/contact. More information on the Butte County FSC's 6th Grade Education Program, including an educational brochure can found at http://www.thenet411.net/index.php/programs/6th-grade-education. Community projects such as fire-safety education signs created by local schoolchildren can also be very effective. These informative signs can be placed in high fire risk and hazard areas throughout the community to educate residents and visitors regarding the potential fire risks associated with their activities.

- *Develop countywide standards for school- or community-based fire safety education programs.* —Fire Prevention Officers, HCFSC, School Districts **(M)**
- *Implement fire-safety curricula in all grade levels throughout the area, in conjunction with community educational projects.* —School Districts, Federal Agencies, Fire Prevention Officers, Local FSCs **(M, O)**
- *Work with 4-H chapters to develop local fire-safety educational programs.* —Fire Prevention Officers, Local FSCs **(S, O)**
- *Fund and develop a service-learning program in local high schools focused on fire safety and defensible space.* —Fire Prevention Officers, HCFSC, Humboldt State University (HSU), Chamber of Commerce, Local Industries (**M)**

III.4.2. Offering Fire-Safety Education to New Residents and Tourists

Humboldt County experiences large influxes of tourists visiting the county each year, most of these during fire season. Some of these visitors return to relocate to Humboldt County, many from urban areas. These new inhabitants often do not have experience with fire in the WUI. Educational programs are needed targeting the tourism, development, and real estate industries, as well as their clients.

Residents or visitors can find useful information about their local fire protection on the Humboldt County Web GIS Portal at: http://gis.co.humboldt.ca.us/. If they click on the "Fire Planning" application, they will be directed to a map showing fire department jurisdictional boundaries and response areas. Map tools on this site allow the user to zoom in on their property or search by parcel number and learn details about the LOS provided by their local fire department.

- *Develop fire-safety educational programs for real estate and development industries*. —Fire Prevention Officers, HCFSC **(M)**
- *Develop fire-safety educational programs for local tourism industries.* —Fire Prevention Officers, HCFSC, County Visitor Information Center, Chambers of Commerce **(S)**
- *Support the use of the Local Option Real Estate Transfer Disclosure Statement to inform buyers of local conditions and ordinances that could be relevant to real estate transactions including the availability of fire service.* —Humboldt Association of Realtors, Fire Chiefs, HCFSC **(S, ✋)**
- *Ensure that the availability of the Humboldt County Web GIS Portal is well known and that residents and fire departments understand the benefits of the "Fire Planning" Application.* —County Planning and Building, Fire Chiefs, HCFSC **(S, ✋)**

- *Target fire-safety educational efforts to new residents, especially those coming from urban areas and others with little experience with fire in the WUI.* —Fire Prevention Officers, HCFSC, County Planning and Building, Humboldt Association of Realtors, Chambers of Commerce **(M)**
- *Develop a welcome-neighbor program, offering a welcome basket with fire-safety information for new residents*. —Fire Prevention Officers, HCFSC, Local FSCs, Firewise Community Boards or Committees, Senior Centers **(S,)**
- *Develop fire-safety educational programs targeted at educating new residents to be distributed through water districts and other utilities, fire departments, chambers of commerce, insurance industry, and other interested partners.* —HCFSC, Local FSCs, Plan Partners, County Planning and Building **(M)**

III.5. Implementing and Maintaining this CWPP

Large amounts of data have been developed and collected through the extensive community processes involved in the creation of the 2006 Master Fire Protection Plan, local CWPPs, and this CWPP. That information is now available through the Humboldt County Web GIS Portal.[17] A feasible scenario for managing this data, keeping it current, and make it most useful and accessible to Humboldt County residents is needed.

Finally, no plan is ever permanent. This CWPP update was written in 2012 based on current conditions and best available information. The field of fire safety is rapidly changing. It is likely new developments will occur in the coming years. Therefore, it will be important to review this Plan at least every five years and update it as needed.

- *Set up a system to mange the massive amount of data generated through this planning process and make it available to the public through the Humboldt County Web GIS Portal. Ensure the continued sharing of data sets as progress is made on projects and new priorities are identified.* —HCFSC, County Planning and Building (GIS), Local FSCs, CAL FIRE, Federal Land Management Agencies **(S, O)**
- *Review the Humboldt County CWPP at least every five years and update it as needed, using a collaborative public process.* —HCFSC, Plan Partners **(M)**

III.6. Reducing Hazardous Fuels Throughout Humboldt County

Reducing hazardous fuel is a challenge for most communities in the western United States. The amount of accumulated fuel is far greater than most communities can afford to tackle, hence the need to prioritize projects. The research is still unclear regarding the most effective and efficient way to reduce fuel without compromising ecosystem health. To address this uncertainty, this CWPP promotes an approach to fuel reduction that is sensitive to impacts on ecological processes and is in compliance with all applicable environmental laws and regulations.

In terms of prioritizing fuel *treatments* across large landscapes, it is generally agreed that treatments should be focused first around communities in the WUI. Many residential areas in Humboldt County qualify for such treatments. Priority fuels reduction projects were identified for these areas at community workshops and are summarized in the PUAPs in Part IV of this CWPP and included, in more detail, at the Humboldt County Web GIS Portal, "Fire Planning" Application: http://gis.co.humboldt.ca.us/.

As stated in section III.4 above, fire safety must begin in the areas immediately surrounding homes. As one moves farther out from structures, fuel reduction treatments begin within the Wildland Fuel Reduction Zone, or that area closest to homes and structures and beyond the defensible space zone. *(See Part V. Fire-Safe Communities for a more detailed explanation of these zones and appropriate treatments in the Wildland Fuel Reduction Zone).* Beyond homes and the defensible space zone, strategic locations around neighborhoods and communities need to be identified and prioritized for creating *fuelbreaks*, and shaded wherever there is a canopy. "Fuelbreaks are never

[17] http://gis.co.humboldt.ca.us/

designed to stop fires but to allow suppression forces a higher probability of successfully attacking a wildfire."[18] Strategic, landscape fuelbreaks can have an impact on the progress of a wildfire and have the potential to stop it or slow it down. There are numerous examples of a wildfire burning quickly through the crowns of trees and then dropping to the ground where it burns more slowly and less destructively after it encounters a fuelbreak.

The combination of home construction modifications (*hardened homes*) with effective defensible space and *shaded fuelbreaks* around communities is one of the best-known strategies to protect communities from wildfire.

There is no "one size fits all" prescription for shaded fuelbreaks. The width can vary widely, for example, ranging from 50 to 300 ft. "A shaded fuelbreak is created by altering surface fuel, increasing the height to the base of the live crown, and opening the canopy by removing trees."[19] *Sample prescriptions are described in Part V of this CWPP*. In addition to initial implementation, maintenance of fuelbreaks is often costly, and needs to be considered with the initial project. Maintaining the canopy *cover* (hence, the concept of a "shaded" fuelbreak) helps to reduce these costs by slowing regeneration.

> "*Manual treatment* is very expensive, and *mechanical treatment* is only feasible on gentle terrain. *Prescribed fire* can be effective but there is potential for fire escape along the edges. Late winter burns, where the previous year's production is cured, the perennials have not yet greened up, and the adjacent forest is not very flammable, may be a possible cost-effective treatment to avoid risk of escape from maintenance burns and achieve effective maintenance at low cost."[20]

In Humboldt County, there is mixed support for controlled burning (or prescribed fire), especially on public lands. Facilitating the re-integration of fire into the region through prescribed burning can reduce maintenance costs for fuel reduction projects, greatly improve forest health, and contribute to the aesthetic quality of the forest. With fuel reduction efforts limited by the high costs of implementation, prescribed fire may be the only way to meet fuel reduction goals for the County. However, there are added risks to prescribed burning such as air quality impacts, vegetation mortality, and *escape* liability. At the same time there is much misunderstanding about the integral role of fire in maintaining forest health, including the resiliency of forests to wildfire. Thus, it is necessary to increase public awareness of the beneficial uses and consequences of fire, and of the state and federal programs supporting prescribed burning. Increasing public awareness of safe burning practices, liability issues, and sources of support (e.g., the CAL FIRE Vegetation Management Program) is critical to this end.

To most effectively maintain the various fuelbreaks proposed on non-federal lands throughout the county, an "Adopt a Fuelbreak" program can be developed by local FSCs in cooperation with community and/or neighborhood groups, homeowners associations, road associations, and others. Each group would be responsible for ongoing maintenance of their adopted fuelbreak. This would need to be done in cooperation with experienced fire and resource professionals to ensure participant safety and fuelbreak effectiveness.

A relatively recent and significant development that affects Humboldt County fuels, especially in the southern part of the county, is the incidence of Sudden Oak Death (SOD) within some parts of the county. SOD is a caused by *Phytophthora ramorum* an invasive forest pathogen introduced to California in the mid-1990s through the horticultural plant trade. Affected areas can have a significantly higher fire hazard due to higher proportions of dead fuels of all sizes and prevalence of *snags*. This disease can easily spread by wind-driven rain events and the affected area is anticipated to grow substantially. Recent research has helped to characterize the nature of the risk and can help to guide firefighter response.[21] *(For more discussion on Sudden Oak Death in Humboldt County, see "Vegetation and Fuels" in section II.1.3 of Chapter II.1. Wildfire Environment.)*

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[18] Agee, J.K., Bahro, B., Finney, M.A., Omi, P.N., Sapsis, D.B., Skinner, C.N., van Wagtendonk, J.W., & Weatherspoon, C.P. (2000). The use of shaded fuelbreaks in landscape fire management. *Forest Ecology and Management, 127*. (pp. 55–66.) Retrieved from http://www.fs.fed.us/psw/publications/skinner/psw_2000_skinner(agee)001.pdf

[19] Agee et al. (2000). The use of shaded fuelbreaks in landscape fire management. (p. 56.)

[20] Agee et al. (2000). The use of shaded fuelbreaks in landscape fire management. (p. 60.)

[21] California Fire Science Consortium. (2012, June). *Research Brief for Resource Managers.* Retrieved from www.cafiresci.org/storage/papers/Valachovic%20et%20al%202011_CFSC_June%202012.pdf

The PUAPs in Part IV of this CWPP include the shaded fuelbreaks and other fuel-reduction projects that were prioritized for implementation in Humboldt County. These projects were generally identified at a community workshop, or otherwise resulted from this planning process. Projects were prioritized based local knowledge as well as considerations for Fire Hazard Severity Zone ratting, terrain, values at risk, level of community support, and population density, with an emphasis on interface areas.

- *Obtain funding to maintain existing cooperative fuel-reduction projects throughout the county and to initiate new programs in priority areas*. —HCFSC, Appropriate Land Management Agencies **(O)**
- *Secure funding and implement the strategic fuelbreaks and fuel-reduction efforts identified through this CWPP process and stored in the Humboldt Web GIS Portal.* —HCFSC, Local FSCs, Other Applicable Agency and Plan Partners, (including SRNF, BLM, CAL FIRE, HRCD, etc.) **(O)**
- *Work collaboratively to pool resources to create shaded fuelbreaks along key access roads*. —Local FSCs, County Public Works Roads Division, Public Land-Management Agencies, CAL FIRE **(M, O)**
- *Educate residents on the positive and negative aspects of controlled burning and prescribed fire and other fuel-reduction options*. —Public Land-Management Agencies, Tribal Experts, CAL FIRE, NCUAQMD,[22] Local FSCs **(S)**
- *Increase public awareness of fire as a tool for improving community fire safety, forest health, and ecological diversity through public education programs and by working with local FSCs.* —Northern California Prescribed Fire Council, Public Land-Management Agencies, Tribal Experts, CAL FIRE, NCUAQMD, Local FSCs **(S)**
- *Work with local air-quality regulatory agencies to identify and discuss obstacles to prescribed burning.* — HCFSC, Local FSCs, Fire Prevention Officers, NCUAQMD, Northern California Prescribed Fire Council **(S)**
- *Develop an "Adopt a Fuelbreak" program for maintenance of fuelbreaks, and employ appropriate maintenance practices.* —HCFSC, Land-Management Agencies, CAL FIRE, Tribal Experts, Other Fire and Resource Professionals **(M)**
- *Maintain community awareness of SOD and associated impacts, and provide education and outreach to help residents prepare for and respond to the impacts associated with SOD.* —HCFSC, Local Fire FSCs, Watershed Groups, State and Federal Agencies **(O)**
- *Help coordinate a response to SOD that is consistent with hazardous fuel-reduction efforts for impacted communities.* —HCFSC, Local FSCs, Watershed Groups, State and Federal Agencies **(O)**
- *Identify non-federal matching funding sources for federal grants that support county partnership efforts in monitoring and management of SOD*. —Local Foundations **(S)**
- *Provide education to residents connecting fire-safe forests, timber production, and ecological restoration efforts.* —UCCE, Public Land-Management Agencies, CAL FIRE, Local FSCs **(O)**

III.6.1. Improving Access: Fuels Management and Maintenance of Roads

Roads are critical components in the fire equation. They are vital for *evacuation* and for firefighters and other emergency responders to access residences. They are also often strategic places for shaded fuelbreaks for firefighters to be able to fight a fire.

At the community CWPP workshops road access was a consistent and prominent issue. Throughout the county—especially in rural areas—numerous neighborhoods are situated along dead-end roads, which means there is only one-way in and out, both for emergency service vehicles *ingress* (often rapidly) for first response, and also for local residents *egress* to evacuate. Projects to improve access were identified at community workshops and are

[22] North Coast Unified Air Quality Management District (NCUAQMD).

summarized in the PUAPs in Part IV of this CWPP. They are included in more detail at the Humboldt County Web GIS Portal, "Fire Planning" Application: http://gis.co.humboldt.ca.us/.

Much of rural Humboldt County was developed on the network of old logging roads from the 1950s and 60s; well before fire safety or environmental standards were required. Hence, many roads lack adequate *turn-outs* and have heavy fuel loads. This combination creates a greater chance of a wildfire to "jump" across a road. As well, there is usually not enough *set back* or clearance to allow people to get safely in or out during a wildfire, which greatly increases their chance of getting caught in the middle of the fire.

Heavy brush along roads damages fire trucks, scratching them and breaking off mirrors. Vegetation above roads creates an unsafe condition for firefighters, as they are forced to enter through a tunnel of vegetation to fight a fire. Finally, road quality issues such as ruts, gravel, and steep and narrow roads make it more difficult for fire trucks to quickly get into an area and safely get back out.

Where bridges are narrow or unstable, and previous landslides have resulted in limited passage, fire trucks and other emergency response vehicles are slowed in their response. Several areas were identified in the community meetings as needing bridge or road repair work. These are also identified in the PUAPs in Part IV.

Upgrading roads to Humboldt County *Fire Safe Standards (see Appendix F: County Fire Safe Standards)* has been especially controversial in the last several years. To subdivide or otherwise develop in many areas of the county, current regulations require upgrading road conditions—especially road widths—to the Fire Safe Standards. In many cases this is not feasible for residents. Therefore, **ensuring that roadways in high and very high fire hazard areas have excellent clearance along both sides, and adequate turn-outs, is essential throughout rural Humboldt County** *(see Figure II.1-9. Fire Hazard Severity in Part II).*

- *Identify road ingress and egress issues that increase emergency response times.* —County Planning and Building (GIS), County Public Works, Cities, Fire Chiefs, Law Enforcement, Caltrans, Humboldt County Association of Governments (HCAOG), California Highway Patrol **(S)**
- *Secure funding and other resources to repair, maintain, and/or upgrade priority ingress and egress sites*. —Humboldt County and City Public Works Departments, Caltrans, Fire Chiefs, Development and Timber Industries, Other Public Land Managers (where appropriate) **(O)**
- *Create turn-outs along dead-end roads to facilitate emergency-response ingress and resident egress (evacuation).* —Neighborhood and Homeowners Associations, Humboldt County Residents, Local Fire Departments, Law Enforcement **(M, O)**
- *Maintain (trim back) vegetation on roads along private properties. Remove all dead and dying vegetation, and mow fuels along driveways and roads to County and City codes. Prune all branches that are hanging over private roads and driveways to a height of 15 ft. or more above the ground.*[23] —Humboldt County Residents, County Public Works **(S, O)**
- *Implement shaded fuelbreaks on access roads, especially those identified at community workshops*[24] *to improve safety for evacuation as well as for firefighters responding to a wildfire.* —HCFSC, Local FSCs, Industrial and Public Land Managers, Neighborhood Groups and Homeowners Associations **(M, O)**
- *Dovetail fuel treatments along roads with fisheries concerns to enhance project efficiency and funding opportunities.* —Local FSCs, Watershed Groups, Public and Private Land Managers **(S, O)**
- *Institute development conditions on new subdivisions designed to control vegetation alongside roads and in public areas, thus reducing the risk of fire spreading to or from private property*. —County Planning and Building Department, BOS **(M)**

[23] *See Part V. Fire-Safe Communities for shaded fuelbreak specifications.*

[24] *See Community Identified Projects Map in each Planning Unit Action Plan within Part IV of this CWPP, as well as the "Fire Planning" Application of the Humboldt County Web GIS Portal at: http://gis.co.humboldt.ca.us/.*

III.6.2. Reducing Fuels Along Power Line Easements

Landowners repeatedly expressed concerns at the community workshops regarding power line easements traversing their property and the subsequent increase in wildfire risk. In many cases the periodic *brushing* and trimming done below PG&E power lines—meant to keep the easements safe— has contributed to a fuel build-up and an increased fire hazard to private property, as well as to risks of wildfire in the National Forests. The fact that materials cannot be burned under power lines exacerbates the problem. These dead materials accumulate over time, with brush species growing up through them, creating a tangled strip of hazardous fuels. These PG&E easements have, in some cases, become literal fuses that, were a fire to occur, would carry it quickly and dangerously directly to the homes they serve.

To further aggravate the problem, when there are problems with electrical transformers and they spark, they can then ignite the fuel build-up below and send embers or even wildfire along their paths directly to nearby homes, and other structures with electricity.

PG&E's vegetation management policies and schedules cannot meet every individual landowner's needs. However, the problem in Humboldt County—especially in the areas of Orleans, Willow Creek, and Southern Humboldt—is consistent and widespread and must to be addressed.

- *Set up a committee to work closely (meeting at least annually) with PG&E to better understand the problem of increased fuels and ignitions along power lines to collaboratively identify solutions.* —HCFSC, Local FSCs, PG&E **(S)**
- *Explore the possibility of PG&E using its community-investment program to support a local FSC to undertake supplemental fuel reduction, to occur in between the regular maintenance times of their contracted crews.* —PG&E, HCFSC, Local FSCs **(S)**

III.7. Preparing Humboldt Communities for Emergencies

The difference between being prepared for emergencies or not can literally be the difference between life and death. It's to everyone's advantage to be ready for the inevitable natural disasters that face us, as wildfire and other emergencies such as earthquakes and tsunamis will continue to be a reality for Humboldt County residents. Actions can be taken at the neighborhood, community, and countywide level to help ensure that all local residents and properties are as safe as possible.

- *Ensure local jurisdictions have completed Local Hazard Mitigation Plants to be eligible for pre- and post-disaster federal funding.* —Humboldt County Office of Emergency Services (OES), County Public Works, Local Jurisdictions, **(S, O)**
- *Develop a Wildfire Response Contingency Plan template that can be quickly and appropriately customized during an active wildfire incident*—OES, Fire Chiefs, Local Jurisdictions, CAL FIRE, Federal Agencies **(M, O)**
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III.7.1. Community Emergency Response Teams (CERT)

The *Community Emergency Response Team* (CERT) Program "educates people about disaster preparedness for hazards that may impact their area and trains them in basic disaster response skills, such as fire safety, light search and rescue, team organization and disaster medical operations. Using the training learned in the classroom and during exercises, CERT members can assist others in their neighborhood or workplace following an event when professional responders are not immediately available to help. CERT members also are encouraged to support

emergency response agencies by taking a more active role in emergency preparedness projects in their community."[25]

The CERT Program is a national program of FEMA/CitizenCorps. The new Regional Training Institute ─ Community Disaster Preparedness, a component of Humboldt State University's Office of Distance and Extended Education, offers the 23-hour complete basic CERT course, as well as other practical disaster preparedness classes that can assist individuals, neighborhoods, and workplaces mitigate hazards, reduce injuries, save lives, and by planning ahead, help them recover more readily after disasters. For further information visit www.humboldt.edu/rti or call (707) 499-0754.

Every community or homeowners association in the county would benefit greatly from having at least one functioning CERT team.

For more information on community preparedness, please see Chapter II.5. Community Preparedness and Part V. Fire-Safe Communities.

- *Support the efforts of the new HSU Regional Training Institute — Community Disaster Preparedness.* —BOS, Fire Chiefs, CAL FIRE, HCFSC **(S, O)**
- *Contact HSU Regional Training Institute — Community Disaster Preparedness to learn how to participate in local CERT and other disaster preparedness training programs.* —Homeowners Associations, Local FSCs, Other Neighborhood and Community-Based Organizations **(S)**
- *Ensure that each community has a functioning CERT team.* —HSU Regional Training Institute — Community Disaster Preparedness, HCFSC **(S, O)**

III.7.2. Improving Residential Emergency Preparedness

Effective evacuation planning depends on residents being prepared. This is especially important for families with small children, elderly and disabled citizens, and other vulnerable populations. Residents in remote areas of the county must be especially prepared for evacuation. To this end, all residents should create a Family Disaster and Evacuation Plan. Information is available from the American Red Cross at: www.redcross.org/prepare regarding how to do family disaster planning, and www.redcross.org/prepare/location/home-family/plan for how to create a family evacuation plan. Additional information is available from the Department of Homeland Security at: www.ready.gov/america/index.html. Another resource is the "Living on Shaky Ground: How to Survive Earthquakes and Tsunamis in Northern California" class, presented by HSU's Regional Training Institute ─ Community Disaster Preparedness, which includes a practical seven-step plan to learn about hazards, and how to mitigate them, what to do during a disaster, and how to plan to recover more readily afterwards.

In remote rural neighborhoods or communities, phone trees can be an effective local strategy for disseminating information quickly, as long as they are maintained. Homeowners associations, road associations, and local schools are all good venues for setting up a phone tree. Simple steps regarding how to establish a phone tree can be found at: www.ehow.com/how_4325_set-emergency-phone.html. Commercial options for doing this on a larger scale are available through entities such as One Call Now[26] and Call-Em-All.[27]

As stated above, the HSU Regional Training Institute — Community Disaster Preparedness provides trainings in areas such as creating disaster supply kits, food safety and how to eat nutritiously during disasters, and preparing local businesses for emergencies.

Mobile communications technology can be important during an emergency, especially when power is cut or communication systems are down. Local FM and AM radio stations can be an effective communication tool for

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[25] CERT: Community Emergency Response Team. (n.d.) *Homepage.* Retrieved January 2, 2013 from https://www.citizencorps.gov/cert/

[26] One Call Now. (2013). Retrieved from www.onecallnow.com

[27] Call-em-all. (2013). Retrieved from www.callemall.com

keeping the public informed during emergency situations. Car-chargers for cellular phones and 12-volt inverters for automobile lighter/charger sockets can provide a useful back-up source of power in case of emergencies. USB modems (a.k.a. air-cards) and other portable internet devices can also facilitate emergency communications, especially to friends and family outside of the disaster area.

For more information on residential emergency preparedness, please see Chapter V.2. Ready, Set, Go in Part V of this CWPP.

- *Prepare for wildfire and other emergencies by creating family disaster and evacuation plans.* —Humboldt County Residents **(S, O, ✋)**
- *Consider storing valuable items in a fire-safe urban area during extreme fire weather conditions.* —Humboldt County Residents in Very High Hazard, Remote Rural Areas **(S, O)**
- *Organize emergency phone trees in each neighborhood and keep them up to date. Make sure everyone in the neighborhood is on someone's call list, and that deaf residents (and others with disabilities that may affect their communication abilities) get contacted in person.* —Local FSCs, Homeowners Associations **(S)**
- *Conduct disaster-preparedness and emergency-response drills, throughout Humboldt County.* —Humboldt County OES, Identified Emergency Management Staff Members of the County and Cities, Law Enforcement, Local Fire Departments, Local FSCs, Red Cross, Senior Centers. **(S, O)**
- *Outreach to local businesses to create disaster preparedness plans through the HSU Regional Training Institute -- Community Disaster Preparedness.* —Chambers of Commerce, Business Associations **(S, O)**

III.8. Ensuring Safe and Effective Evacuation

There are myriad issues regarding evacuation in Humboldt County. Chapter V.2. Ready, Set, Go explains how residents can safely and effectively evacuate—or get out—during an emergency situation such as wildfire.

Many neighborhoods in Humboldt County have limited evacuation options, especially due to *one-way-in and one-way-out roads*. Being prepared in the event of evacuation can literally make the difference between life and death. When a wildfire is moving especially fast, such as during crown-fire[28] events, firefighters need to be able to move quickly in their protection efforts. In those cases, it is critical that roads are kept clear of all traffic, another reason to evacuate early and efficiently.

In an example of a worst-case scenario for Humboldt County, a large earthquake could occur during fire season with multiple fire events. In this case there will be many isolated communities and neighborhoods because of blocked access routes. Evacuation planning needs to consider such scenarios.

If residents are trapped because their escape is cut off and the fire is already at their location, such as in the scenario above, there are steps to take to increase the chance of survival. In such cases, residents may need to make decisions on their own about seeking shelter where they can survive the passage of the wildfire until they can reach an evacuation site. It can be very difficult to determine the right thing to do as the fire approaches. Before a wildfire threatens, community members should talk to their local fire department about evacuation procedures in their neighborhood.

For more information on evacuation, please see the Planning Unit Action Plans in Part IV and Chapter V.2. Ready, Set, Go!; adapted from CAL FIRE's publication "Ready, Set, Go!"[29]

- *Provide information about evacuation during a wildfire event. Make sure residents know multiple escape routes for a variety of different wildfire scenarios.* —Humboldt County OES, Cities, Law Enforcement, Red Cross, CAL FIRE, Local Fire Departments, Local FSCs **(S, O)**
- *Develop and distribute local shelter-in-place information in the event that citizens are unable to evacuate.* —Fire Agencies, Law Enforcement ***(*S, O)**
- *Develop and distribute "Ready, Set, Go" evacuation-planning materials to educate residents on evacuation in their community.* —Humboldt County OES, Cities, Law Enforcement, Red Cross, CAL FIRE, Local Fire Departments, Local FSCs **(S, O)**

III.8.1. Developing Evacuation Routes and Sites

Potential evacuation options are identified in each Planning Unit Action Plan *(see Part IV).* These routes may change depending on fire behavior, wind pattern, and other factors. They generally consist of a primary way in and out of a community (a highway or main county road in many cases) and several smaller connecting roads that could be used as ingress and egress to and from the main road.

Community members used their local knowledge to identify potential evacuation routes and sites on the maps at the 2012 community CWPP workshops. This information is being passed on to local law enforcement and fire agencies to review for potential use, as well as being incorporated into the Humboldt County Web GIS database.[30] It will be helpful as potential evacuation routes, evacuation sites, and temporary survival areas are evaluated and, if appropriate, shared with community members.

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[28] *See Chapter II.1. Wildfire Environment for more information on crown fires.*

[29] CAL FIRE (California Department of Forestry and Fire Protection), Ready for Wildfire. (2012). *Go! Evacuation Guide.* Retrieved from www.readyforwildfire.org/go

[30] http://gis.co.humboldt.ca.us/

It is important to emphasize that the safest evacuation route and sites will depend on the location of the wildfire. Evacuation plans for wildfire that identify specific evacuation routes are challenging to develop and could be misleading. Humboldt County relies on adaptable procedures that will guide the development of evacuation plans for specific events. It is, however, important to inform residents about evacuation preparedness and procedures and make sure that they are aware of multiple possible evacuation routes in and out of their communities. *Information about evacuation routes and sites can be found in Chapter V.2. Ready, Set, Go!*

- *Collaborate to develop local evacuation preparedness materials and planning processes, with input from local FSCs and other community groups.* —Local Fire Departments, Humboldt County OES, Law Enforcement, Local FSCs, Homeowners Associations, Neighborhood Groups **(S, O)**
- *Identify local evacuation sites and temporary survival areas and ensure neighborhood residents know where they are.* —Local Fire Departments, Humboldt County OES, Law Enforcement, Local FSCs, Homeowners Associations, Neighborhood Groups **(S, O)**
- *Develop and/or upgrade appropriate sites (including those identified at community meetings) to function as evacuation sites and/or disaster centers during emergency situations.* —Local Fire Departments, Red Cross **(M)**
- *Survey gathering places in each neighborhood and include in local evacuation planning.* —Local FSCs, Homeowners Associations, Local Fire Departments, Law Enforcement **(S)**
- *Review the community-identified evacuation information generated through this planning process for development as incident-specific evacuation areas and routes.* —Local Fire Departments, Humboldt County OES, Law Enforcement **(S)**
- *Review feasibility of alternate evacuation routes*. —Local Fire Departments, Humboldt County OES, Law Enforcement, Neighborhood and Homeowners Associations, Local FSCs **(M)**
- *Review and incorporate the community-identified evacuation information generated through this planning process into Humboldt County GIS database.* —Local Fire Departments, Humboldt County OES, Law Enforcement, County Planning and Building (GIS) **(S, ✋)**
- *Identify leadership and resources to develop evacuation procedures and information for vulnerable populations.* —County of Humboldt, Cities, Social Services Agencies, Senior Centers, Law Enforcement, Local Fire Departments, Red Cross, Local FSCs, Humboldt County OES, Other Interested Local, State, And Federal Agencies **(M)**

III.8.2. Evacuating Pets and Large Animals

Many Humboldt residents have pets, large animals (especially horses), or both. Large animals require pre-planning for safe and effective evacuation. A system of *evacuation sites* for both pets and livestock needs to be developed at both the local and county scale. Many community shelters will not allow animals other than assistance or service dogs into their facilities during an emergency. Humboldt County OES is in the process of developing an animal control plan that will assist in the safe evacuation of animals during a disaster. *See section V.2.3 in Part V. Fire-Safe Communities for more information on preparing for the safety of pets and livestock during emergencies.*

- *Work with Plan Partners, Red Cross, Humane Society, County of Humboldt, and local veterinarians to identify existing options for local pet and livestock emergency evacuation. Work through local feed stores, veterinarians, boarding facilities, and animal associations to educate residents on options.* —Local FSCs, Humboldt County OES **(M, O)**

- *Collaborate to develop local horse[31] evacuation plans.* —Horse Owners, Local Fire Departments, Humboldt County OES, Law Enforcement **(S, O)**
- *Trailer-train horses to safely evacuate.* —Horse Owners **(S, O)**
- *Distribute existing pet and large-animal evacuation literature to Humboldt County residents.* —Local FSCs, Veterinarians **(S, O)**

III.8.3. Ensuring Gates Function During Emergencies

Gates can pose a serious obstacle to safe and effective evacuation. Automatic gates that do not open during power outages are especially dangerous, and may be illegal.

- *Initiate informational programs to educate residents about the importance of easily passable gates during emergencies.* —Law Enforcement, Local Fire Departments, Local FSCs, Homeowners Associations **(S, O)**
- *Educate residents regarding the need to unlock gates during wildfire and other emergencies.* —Local Fire Departments, Local FSCs, Homeowners Associations **(S, O)**
- *Explore incentives and options for fire-safe gates.* —Law Enforcement, Fire Chiefs, CAL FIRE, Local FSCs, Homeowners Associations **(M)**
- *Encourages residents and neighborhoods to use* Knox Boxes[32] *and provide gate codes to local Fire Departments.* —Humboldt County Residents, Local Fire Departments **(S, O)**

III.9. Hardening Homes to Survive Wildfire: Reducing Structural Ignitability

As detailed throughout this CWPP, effective fire-safe communities begin by making homes and other structures ready for wildfire. Reducing the chance that structures (our homes, businesses, etc.) will burn is a fundamental component of any CWPP.

> "Research shows that a home's ignition potential during extreme wildfires is determined by the characteristics of its exterior materials and design and their response to burning objects within one hundred feet and firebrands (burning embers)."[33]

The California State Fire Marshal's Office has developed state-of-the-art building standards[34] for use within the WUI zone. The current standards became effective in 2011. Humboldt County homeowners need to become familiar with these standards so they can upgrade their homes to improve wildfire survivability. Part V. Fire-Safe Communities, of this CWPP, summarizes these standards.

Local FSCs and homeowner associations could explore the options of neighborhood-wide, wholesale purchase and installation of WUI-building materials such as fire-safe vents. This is an effective and efficient way to reduce costs and wildfire risk; it can reduce the chances of *home-to-home ignition*. Other creative financing options should be explored. For instance, financial incentives are sometimes given for improving home energy efficiency; such as upgrading to double-pane windows, which would also increase a house's structural integrity against wildfire.[35] *For*

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[31] Staples, M. (2012). *How Do You Spell Rescue? If You Have Horses, the Answer is L-A-R.* Mendocino Fire Safe Council, Horse Owner Preparedness [pdf]. Retrieved from http://firesafemendocino.org/pdf/horseall.pdf.

[32] *See Part V. Fire-Safe Communities for more information on Knox Boxes.*

[33] Cohen, Jack. (2008). The wildland-urban interface problem–A consequence of the fire exclusion paradigm. (p. 23.)

[34] CAL FIRE. (2012). *Wildland Hazard/Building Codes.* Retrieved from www.fire.ca.gov/fire_prevention/fire_prevention_wildland.php.

[35] *For more information on energy retrofits contact the Redwood Coast Energy Authority at:* http://www.redwoodenergy.org/.

more information on hardened homes and structural ignitability, please see Chapter II.2. Values and Assets at Risk, and Part V. Fire-Safe Communities.

- *Continue to educate residents on the importance of replacing unrated, untreated wood-shake roofs with rated roofs, kept in good condition and free of combustible debris.* —Fire Agencies, County Planning and Building, Federal Partners, Local FSCs **(S)**
- *Develop incentive-based programs for residents to replace untreated wood-shake roofs.* —County of Humboldt, Cities **(M)**
- *Educate residents on the need to have double-paned windows throughout their homes, with recommendations to upgrade to tempered glass for fire safety where possible.* —Local FSCs, Utilities, Interested Partners **(O)**
- *Explore incentive programs to upgrade windows to double pane or higher standards.* —Local FSCs, Utilities, Energy-Conservation Organizations, Interested Partners **(M)**
- *Educate residents on need for separation of heat loads from residences.* —Local FSCs, Fire Prevention Officers, Other Interested Partners **(O)**
- *Work together to enforce clearing 100 ft. (or to the property line) around structures, as per State law.* —Fire Protection Districts, CAL FIRE, Humboldt County Code Enforcement **(M)**
- *Educate residents on the need to have vegetative and flammable-material clearance around propane tanks and other fuel storage areas near residences, and keep these at least thirty feet from homes and outbuildings.* —Local FSCs, Other Plan Partners **(O)**
- *Educate residents on the risks of having wood fences attached to homes.* —Local FSCs, Other Plan Partners **(O)**
- *Educate Humboldt County residents on current California WUI (Chapter 7A) building standards and the products approved by the State Fire Marshal's office.* —County Planning and Building, HCFSC, Local FSCs, Homeowners Associations **(S, O)**
- *Create a handout to distribute to residents graphically depicting current WUI building standards in a user-friendly format.*[36] —County Planning and Building **(S, ✋)**
- *Stay current on applicable WUI standards and new legislation through the California Fire Marshal's Office*. —County of Humboldt, Cities **(O, ✋)**
- *Create and implement educational programs on hardening homes, including the possibility of a WUI-building products fair.* —Local FSCs, Plan Partners **(M)**
- *Work with State Fire Marshal-approved WUI building product vendors*[37] *to create discounted wholesale purchases and installation of products to harden homes at the neighborhood scale.* —Local FSCs, Homeowners Associations. **(S, O)**
- *Explore parallel incentive programs that can finance upgrading homes to current WUI-building standards.* —HCFSC, County Planning and Building, Cities **(M)**

[36] *Look to other California counties for examples, particularly Ventura County:* County of Ventura, Resource Management Agency. (2011, November). *High Fire Hazards/Fire Hazards Severity Zone Requirements*. Building and Safety Division. Retrieved from www.ventura.org/rma/build_safe/pdf/handouts/b-60.pdf.

[37] CAL FIRE, Office of the State Fire Marshal. (2007). *Building Materials Listing—Search Listing Services.* Retrieved from http://osfm.fire.ca.gov/licensinglistings/licenselisting_bml_searchcotest.php.

III.10. Enhancing Emergency Notification and Communications

Effective communication between all fire agencies, emergency medical service, and allied agencies, is critical to the health and safety of local residents and emergency services personnel. Communication includes information sharing, dispatch, and inter- and intra-departmental radio communication.

The Humboldt Operational Area Communications Committee (HOACC) was recently formed,[38] composed of representatives of local, state, and federal agencies and other area organizations operating radio communications systems in the county. This group can help provide leadership on this issue.

For more information on emergency communications, please see Chapter II.3. Wildfire Protection Capabilities.

- *Improve communication and coordination between local fire departments, CAL FIRE, and federal agencies during fires and other emergencies.* —HOACC, HCFSC Improve Emergency Dispatch Services Committee, Fire Chiefs, CAL FIRE, Federal Agencies **(M)**
- *Support communication and collaboration between fire and public safety agencies while maintaining the integrity of their distinct public service roles.* —HOACC, HCFSC Improve Emergency Dispatch Services Committee **(S, O)**
- *Encourage radio users to install all state and federally authorized standard inter-operability frequencies in all radios*—All Emergency Responders (including Local Fire Departments and Law Enforcement) **(S, O)**

III.10.1. Improving Emergency Dispatch Services

Dispatch services throughout Humboldt County are provided by a variety of entities. The majority of local fire departments are dispatched through the Fortuna Interagency Command Center (FICC), also known as the dispatch center. Countywide dispatch is dependent upon communications equipment that is in some cases unreliable. Personnel cost increases for dispatch services are not being matched with the necessary revenue increase to maintain the status quo. Excellent coordination between dispatch centers, adequate personnel, and reliable equipment are crucial to the provision of quality emergency services. The FICC dispatch console and the CAL FIRE Humboldt—Del-Norte (HUU) repeater systems are in the process of a full-system upgrade. The upgrade is projected to address unreliability and dead zone issues, and is scheduled to be completed by the end of 2013.

Community input provided through this CWPP process indicates that there are still problems with how fire departments are being dispatched and confusion about how road names and home addresses are organized in some areas. It has been identified that coordination between CAL FIRE, County Sheriff, local fire departments, County Public Works, and County Planning could address some of the dispatch, addressing, and road name issues. Further consolidation of dispatch services could eliminate duplication of efforts and confusion over different data sources and procedures, reduce cost, and improve efficiency.

There are many areas in the county where several different names are used to identify the same road or street, which can cause unneeded confusion during *dispatch* and emergency situations. When members of the public report emergencies, they will sometimes refer to the incident location as they know it from an historical perspective or a general location reference. If this location does not match information in the FICC Computer-Aided Dispatch (CAD) system, uncertainty about where responders should go can result. Several specific areas continue to create the most problems, including Highway 211/Ferndale Highway, and Wilder Ridge/Mattole Road/Bull Creek Road. Local dispatch and first responders need to agree on standardized naming usage for these areas, and educate other affected parties (e.g. other first responders) as to the protocol. Programming the CAD system to automatically pull up “also known as” (a.k.a.) road names could also help reduce confusion.

[38] *For more information, see Section I.3.4. Plan Implementation Progress Review.*

- *Encourage more effective communication between fire departments and dispatch centers (including a semi-annual feedback survey, dispatch center staff field trips, and fire department visits to the dispatch center.).* —HOACC, HCFSC Improve Emergency Dispatch Services Committee **(S, O)**
- *Share datasets, to keep data current, and to integrate community-identified information received by the County.* —FICC, County Sheriff's Department, County Planning and Building (GIS) **(S, O, ✋)**
- *Consolidate dispatch services where it can be accomplished, both within and across agencies.* —All Emergency Responders (including Local Fire Departments and Law Enforcement) **(S, O)**
- *Program unofficial," a.k.a." road names into the FICC CAD and enable the system to automatically recognize and pull up the correct location.* –CAL FIRE Dispatch Center, Battalion Chiefs, Local Fire Departments **(M)**
- *Augment staffing levels during peak fire season at the FICC.* —CAL FIRE, Fire Chiefs **(M)**
- *Secure funding to expand the program of outfitting emergency response vehicles with on-board computers that enhance dispatch and aid firefighters in their efforts to locate incidents.* —Fire Chiefs, Humboldt County OES **(M)**
- *Add Repeaters/Tones in dead zones/holes to help communications between firefighters and the FICC (i.e. Miranda, Myers Flat, Weott, Whale Gulch, Whitethorn, Ettersburg, Honeydew).* – Fire Chiefs, Humboldt County OES, CAL FIRE **(M**, **L)**

III.10.2. Facilitating Effective Notification and Communications to Residents

Difficulties exist regarding how to effectively and rapidly alert residents, especially in the rural areas of the county. Options need to be explored to improve emergency communication in these areas. Social networking alternatives such as Facebook and Twitter, while not infallible, are proving their usefulness in rapid and effective communication when normal networks may not be functioning. Using these communication tools should be fully explored.

Local radio stations are able to disseminate emergency information to Humboldt County residents. Large numbers of residents have ready access to FM and AM radios and are encouraged by emergency preparedness organizations, such as the Humboldt County OES, CalTrans, and the Red Cross, to tune in for information and updates in emergency situations. Currently, KMUD FM radio utilizes information from CAL FIRE, California Highway Patrol, the County Sherriff's Department, and the Southern Humboldt Fire Chiefs Association Public Information Team to provide live emergency updates on-air, through Facebook and Twitter, and to answer questions via phone calls from concerned residents.

The County of Humboldt has an operable reverse calling notification system available for use during emergency events. The system does not however, include access to all area telephone numbers throughout the county. It only includes listed numbers by AT&T and Frontier; these numbers are updated monthly. There is currently no process whereby individual telephone numbers can be input into the system by the public, as currently occurs elsewhere in the state.

Finally, some areas of the county have unreliable cellular phone coverage. Some such areas were identified during the community workshops. This lack of coverage can increase emergency communication challenges, especially in more remote areas of the county where communication issues already tend to already be greater.

- *Upgrade County's mass notification system to include all local phone numbers, and ability for residents to register their home and cellular numbers into the system.* —Humboldt County OES, County Sheriff's Department, HOACC, Fire Chiefs **(M)**
- *Elevate awareness and use of existing notification systems such as KMUD FM & KHUM FM radio and other local FM and AM radio stations.* — Fire Chiefs, Humboldt County OES, HCFSC **(S, O, ✋)**

- *Collaborate to explore additional measures for alerting residents to pending emergencies, including social networks, local radio broadcasts (using what KMUD has developed as a model).* —HCFSC, Humboldt County OES, Law Enforcement, Fire Agencies, Local FSCs, Homeowners Associations **(S, O)**
- *Contact cellular providers to explore additional cellular tower locations*. —Homeowners Associations, Local FSCs, Neighborhood Organizations **(S)**

III.11. Designating Wildland-Urban Interface Areas

Referred to throughout this CWPP, the WUI is a general term describing the area where homes and wildland meet. It also has a federal definition as the "line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuel as defined in the Federal Register."[39] It is within the WUI that specific federal management actions take place in order to reduce fuel risks, based on guidelines established by the Healthy Forests Restoration Act (HFRA).

> "The HFRA provides administrative procedures for hazardous-fuel-reduction projects on [federal] lands in the WUIs of at-risk communities. The act encourages the development of Community Wildfire Protection Plans under which communities will designate their WUIs, where HFRA projects may take place."[40]

Concurrently, federal agencies are charged with developing WUI designations for the properties they manage. WUI designations have been made in all the existing, local CWPPs in the county; this CWPP supports those designations. Those areas without a local CWPP still need to have WUI defined, on a case-by-case basis.

- *Accept those areas of the county already designated as WUI in local CWPPs.* —Federal Agencies ***(S,*** ✋***)***
- *Gather all locally identified WUI information and create a map of existing WUIs in Humboldt County.* —HCFSC, County Panning and Building (GIS) **(S,** ✋**)**
- *Create a map to identify potential WUI areas for those areas without local designation, and share with local residents.* —HCFSC, County Planning and Building GIS **(M)**

III.12. Utilizing Excess Fuels

Under preferable conditions, fuels removed from hazardous areas can be utilized in some way to help defray fuel-reduction costs. Humboldt County is fortunate in that it still has an intact timber industry; hence there is capacity for utilization of *small-diameter wood products* (e.g. creating finished products such as furniture).

Woody biomass is organic material from living matter and in this case refers to the materials produced from fuel-reduction projects. Biomass and its by-products can be used as sources of energy and in a variety of other value-added products. Care must be taken to ensure biomass efforts do not further damage impaired forest ecosystems.

There are also several biomass facilities in the county and significant research into biomass is happening here, especially through the Schatz Energy Center at HSU. Biomass information, such as studies and periodic workshops and conferences, is shared among and between UCCE, Schatz Energy Center, the Redwood Coast Energy Authority (RCEA), the HCFSC, and local FSCs. RCEA hosts the Humboldt Biomass list-serve to facilitate

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[39] Office of the Federal Register, National Archives and Records Administration. (2001, January 4). Implementation direction for identifying and prioritizing hazardous fuel reduction in wildland-urban interface/intermix. *Federal Register, Vol. 66(3),* (pp. 751-754.) Retrieved from http://www.gpo.gov/fdsys/pkg/FR-2001-01-04/content-detail.html

[40] Healthy Forests Initiative and Healthy Forests Restoration Act. (2004, February). *Interim Field Guild, Title I, Wildland-Urban Interfaces Within or Adjacent to At-Risk Communities.* FS-799. (p. 15.) Retrieved from www.fs.fed.us/projects/hfi/field-guide/web/page15.php.

communication and coordination. However, this list-serve and its hosting is only feasible if there is active participation, which has been lacking in the past.

Successful implementation of a self-sustaining biomass utilization program will require the following steps: 1) establishment of an industry and agency working group (including resource and air quality management agencies as well as environmental interests); 2) compilation of all local and regional biomass utilization studies; 3) identification of additional local biomass utilization resources and assets; 4) identification of potential local, state, and federal funding sources and programs; and 5) development of recommendations by the industry and agency working group mentioned above to stimulate biomass utilization and fire hazard and risk reduction.

The combination of increased coordination between hazardous-fuel reduction projects and woody biomass utilization will lead to a more strategic and sustainable approach to reducing the buildup of hazardous fuels in Humboldt County.

For more information on biomass, please see Part V. Fire-Safe Communities.

- *Develop a biomass utilization program to develop commercially viable markets for fuel-reduction project wood byproducts and residues such as slash, small diameter logs, foliage, wood chips, etc.* —RCEA, Schatz Energy Center, Public and Private Land Managers, UCCE, HCFSC **(L)**
- *Continue to share latest information related to biomass utilization. Revitalize communication tools, such as the Humboldt Biomass list-serve.* —RCEA, HCFSC **(S, O)**
- *Create information sources that support woody biomass utilization feasibility studies. Document where biomass sources are located, how much is available, and their locations relative to other sources and utilization industries. Characteristics of the sources, such as species, size and moisture content should be included in this documentation.* —RCEA, HCFSC, UCCE, California Fire Science Consortium, Conservation Organizations **(M)**
- *Promote local use of biomass for energy, particularly in areas with high fuel costs and low proximity to industrial utilization. Develop and publish maps of firewood and chip piles available for public use. Investigate wood stove promotion and available rebates such as the North Coast Unified Air Quality Management District's (NCUAQMD) Wood Stove Exchange Program.* -–RCEA, HCFSC, NCUAQMD, Conservation Organizations **(M)**
- *Investigate distributed generation biomass-to-energy technology.* -–RCEA, Schatz Energy Research Center **(L)**

III.13. Maintaining Air Quality

Community protection from wildfire includes efforts to limit the negative health impacts that may result from wildfire incidences. Smoke produced during wildfires and structure fires contains chemicals and fine-particulate matter that can be harmful to human health. Concentrations of smoke vary depending on location, weather, and distance to the fire. Young children, pregnant women, elderly people, and individuals with respiratory disease, such as asthma, are at the greatest risk of experiencing symptoms from smoke inhalation; even healthy adults can suffer the impacts. Air pollution from smoke can also cause damage to agricultural crops, animals, and property values.[41]

The North Coast Unified Air Quality Management District (NCUAQMD) is the regional environmental regulatory agency which has jurisdiction over the air quality in Humboldt County, including the neighboring counties of Del Norte and Trinity. The NCUAQMD regulates opening burning throughout the year by issuing burn permits and allows burning only on designated "Permissive Burn Days" when meteorological conditions are conducive to good smoke management. The NCUAQMD goal is to best mitigate any affects from open burning through the issuance of burn permits, allowable burn days, and by coordinating burn projects. The public must call the NCUAQMD's Burn Day Status line each day at (866) BURNDAY or (866) 287-6329 to determine whether

[41] North Coast Unified Air Quality Management District. (n.d.). *North Coast Air Quality Information*. Retrieved November 6, 2012, from http://www.ncuaqmd.org/index.php?page=air.quality

burning is allowed. The NCUAQMD's opening burning regulations allows residents to dispose of vegetation on their property, and allows for burning by commercial (e.g. timber companies, etc.), government (CalTrans, State Parks, etc.) and even FSC projects.

The NCUAQMD issues daily Air Quality Alerts through Public Service Announcements during any wildfires to keep the public advised if air quality is considered Unhealthy or Hazardous so that appropriate action can be taken.

For more information on air quality, please see Chapter II.2. Values and Assets at Risk and section V.4.2 in Fire-Safe Communities.

- *Distribute kraft paper coverings for burn piles on an "as-needed" basis in order to maintain low moisture levels within vegetation piles prior to burning.* —NCUAQMD, Local FSCs, Local Fire Departments, CAL FIRE **(M, O)**
- *Educate public on the importance of complying with regulations and obtaining burn permits prior to burning vegetation piles.* —NCUAQMD, Local FSCs, HCFSC, Local Fire Departments, CAL FIRE **(S, O)**
- *Encourage the public to use ncuaqmd.org, call 1-866 BURN DAY, or listen to local radio stations for burn-day status information.* —NCUAQMD, Local FSCs, HCFSC **(S, O)**
- *Encourage community members to explore alternatives to burning, such as composting and biomass utilization, when disposing of vegetation piles.*[42] —NCUAQMD, Local FSCs, HCFSC **(S, O)**

III.13.1. Managing Air Quality Information During Wildfires

The North Coast Unified Air Quality Management District (NCUAQMD), the Public Health Branch of the Humboldt County Department of Health and Human Services, and the National Weather Service (NWS) in Eureka, work together to distribute information to the public regarding smoke from wildfires. During wildfire events, NCUAQMD's goal is to keep the public informed and educated about the concentration of harmful smoke in their areas. Concentrations of smoke will vary depending upon location, weather, and distance to the fire(s).

Air Quality Alerts are officially issued by the NCUAQMD as Public Service Announcements (PSA) when the concentration of smoke in an affected area meets the criteria of "Unhealthy" or "Hazardous". The PSAs are distributed to the County's Health Department, NOAA, and other public agencies. In addition, the PSAs are sent via email distribution lists to the media, school districts, and interested parties. Based upon this information, the County's Public Health Officer may take official action in regards to public events and schools. School Districts upon receiving the PSA, may take action to limit school activities. The PSAs can also be heard by calling 1-866-Burn-Day or 1-866-287-6329 and can also be found at the NCUAQMD's website, www.ncuaqmd.org. The National Weather Service (NWS) office in Eureka collaborates with the NCUAQMD to distribute the PSA information to the public using their NOAA Weather Radio transmitter scripts.

In some cases, the NCUAQMD may deploy additional portable air quality monitors (EBAMs) during wildfire events to better determine the smoke concentration in the region. The NCUAQMD currently has several portable monitors for such use, and the data from these and other monitors is utilized in determining Air Quality Alerts. Other monitors can be obtained as needed from neighboring air districts, the California Air Resources Board (CARB), and the U.S. Forest Service (USFS).

- *Expand the practice of running smoke plume models to more accurately pin point where and when smoke issues are going to be most significant, and communicate the resulting information to AQMD for inclusion in their message development for the public*. — NWS Eureka, AQMD, *USDA-FS Northern Region* **(S)**
- *Increase access to critical smoke information for community members in rural areas without such access through the purchase of NOAA Weather Radios for public buildings.* —Local, State, and Federal Agencies **(S)**

[42] *See Section III.1.14. Utilizing Excess Fuels below for more information.*

- *Improve coordination and communications between wildfire managers, NCUAQMD, and local radio and news organizations.* —NCUAQMD, Wildfire Managers, Local Radio and News Organizations **(S, O)**
- *Increase availability of mobile air-quality monitors to better protect and inform local communities.* —NCUAQMD, Humboldt County OES **(M)**

III.14. Integrating Fire-Safety Actions with Local Regulations and Policy

An effective CWPP recognizes and addresses the many levels of land-use planning that go into community making. Throughout California, as people build homes, businesses, and public places, there are many local, state, and federal requirements designed to address fire, public safety, community design, and environmental safeguards. A successful CWPP recognizes these requirements and incorporates their positive benefits into its recommended actions.

Ongoing residential development in unincorporated rural areas of the county, and multi-agency involvement in the implementation of fire-safe standards, both present a challenge to building and maintaining fire-safe communities here. The topic of community protection from wildfire has received much attention in recent years and many new strategies and techniques have been developed. It is crucial at this time to determine whether and how new community protection findings should be incorporated into current fire-safe standards. The implementation of uniform fire-safe standards can reduce future losses of life and property. The Humboldt County Fire Safe Standards were last updated in 1991, long before the current WUI building codes and knowledge regarding *structural ignitability* and effective fuel-reduction practices were known. Updating these standards will ensure that the most current fire-safe techniques are incorporated into the planning regulations, and that the enforcement of these regulations is well coordinated in local jurisdictions throughout the county.

Compliance must be ensured throughout the county with both the WUI building standards (Chapter 7A of the California Building Code) and the County Fire Code 1952. The associated requirements of these standards must be clearly communicated to builders and home and business owners. This will be an important avenue to reduce structural ignitability throughout Humboldt County.

Humboldt County has been in an extensive process of updating its General Plan (GPU), since before the publication of the 2006 Master Fire Protection Plan (MFPP). Because of the planning process and outcomes of the MFPP, the HCFSC has had the opportunity to actively and effectively participate in the GPU. HCFSC reviewed policy recommendations and provided input to the County Planning Commission that was incorporated into the most recent draft of the General Plan (as of late 2012).

Integrating wildfire prevention and planning into other planning efforts and policies is a cost-effective, long-term fire prevention strategy for Humboldt County. In addition to those integrated planning actions already described in this document, the following list of policy actions will further the goals of this CWPP and fire prevention in Humboldt County.

For more information on existing fire-safe regulations, please see Chapter V.4. Legal Requirements.

- *Update Humboldt County Fire Safe Standards to identify specific hazard zones, improve fire-safe measures for community planning areas and/or other unincorporated rural residential areas in the county, and address structural ignitability, roads, vegetation setbacks, and enforcement.* —County Planning and Building, Fire Chiefs, HCFSC, CAL FIRE **(S)**
- *Ensure that the most current fire-safe techniques are incorporated into County regulations, and that the enforcement of these regulations is well coordinated in local jurisdictions throughout the county.* —County Planning and Building, County Public Works, Fire Chiefs, CAL FIRE **(S, O)**
- *Ensure fire-safe development and effective fire-protection service by approving and supporting the relevant policies, standards, and implementation measures of the Community Infrastructure and Services Element in the General Plan—including procedures to address subdivisions and other development outside of Fire District*

Boundaries—and by encouraging new development in areas with existing, adequate fire protection. —BOS **(S, O)**

- *Ensure effective emergency management and pre-wildfire planning by approving and supporting the relevant policies, standards, and implementation measures of the Safety Element in the General Plan.* —BOS **(S, O)**
- *Continue to provide guidance to County Planners towards completion and implementation of the General Plan Update* —HCFSC **(S)**
- *Assist in the implementation of relevant policy and implementation measures from the current General Plan Safety Element, Community Infrastructure and Service Element, and any other relevant Elements.* —HCFSC **(O)**
- *Continue to improve property ownership transactions/new building permit notifications to local fire departments.* —County Planning and Building **(S, O)**
- *Create user-friendly information regarding applicable local and state environmental laws and regulations that property owners might need to know to implement vegetation management actions to reduce wildfire hazard.* —HCFSC, Local FSCs, UCCE, Foresters, Conservation Organizations **(M)**
- *Prepare outreach materials designed to increase understanding of the WUI building standards and County Fire Code 1952.* —County Planning and Building **(S)**
- *Explore options for ecologically based fuel reduction in Streamside Management Zones, through modification of the County permitting process and ordinance, in order to minimize permitting bureaucracy and costs.* —HCFSC, Local FSCs, County Planning and Building, Foresters, Restoration Practitioners **(M)**
- *Prioritize the actions in this CWPP and include by reference in the Humboldt Operational Area Hazard Mitigation Plan, and any subsequent updates of the Local Hazard Mitigation Plan.* —Humboldt Operational Area Agencies **(S, O)**
- *Draft standardized procedures and roles for performing building-permit inspections and implementation of County Fire Code 1952. Towards that end, County Planning and Building, CAL FIRE, and Fire Departments reach agreement on their roles in the process and implementation of procedures.* —County Planning and Building, Fire Prevention Officers, CAL FIRE, **(S)**
- *Coordinate the adoption of the California Fire Code amongst County Agencies.* —Fire Chiefs, Larger Fire Departments **(S, O)**
- *Support policy development that can facilitate rapid and effective response to protect resources at risk from SOD*. —County Planning and Building, BOS **(S)**
- *Advocate for permit streamlining to help facilitate rapid and effective response to protect resources at risk from SOD.* —HCFSC, Fire Chiefs, Conservation Organizations **(S)**
- *Advocate for restrictions on selling SOD-infected plants in nurseries within the county*. —HCFSC, Local FSCs, Conservation Organizations **(S)**

III.15. Designating Communities at Risk

As described in the Values and Assets at Risk chapter of the Risk Assessment, most eligible communities in Humboldt County have already been designated as a *Community at Risk* (CAR), either by federal or state designation. The two remaining communities that need to be added to this CAR list are Redwood Valley and Titlow Hill. The California Fire Alliance has a process to add new communities to this list, which is found on its website: www.cafirealliance.org/communities_at_risk/communities_at_risk_addtolist.

For more information on communities at risk, please see Chapter II.2. Values and Assets at Risk.

- *Add Redwood Valley and Titlow Hill communities to the Communities at Risk list.* —HCFSC **(S, ✋)**

Part IV. Planning Unit Action Plans

Overview

The Planning Unit Action Plans provide an individual wildfire analysis for each of the thirteen *Planning Units* within Humboldt County. The Planning Unit boundaries were determined based on several considerations, including geographic divisions such as *watershed* basins, distribution of community groups, and the jurisdictional boundaries of fire protection services. The thirteen Planning Units in Humboldt County are:

1. Redwood Park
2. Up River
3. East Klamath
4. Hoopa
5. Trinidad
6. Redwood Creek
7. Trinity
8. Eureka Plain
9. Kneeland-Maple Creek
10. Eel
11. Mad-Van Duzen
12. Mattole-Lost Coast
13. Southern Humboldt

The purpose of these chapters is to examine various factors contributing to *wildfire risks*, and to assess the level of emergency preparedness and fire protection capabilities within the communities in each Planning Unit. These local analyses were abetted by a series of community workshops, held at central locations within each Planning Unit as part of the update process of this countywide *community wildfire protection plan* (CWPP). These workshops were conducted by the Humboldt County *Fire Safe Council* (FSC) in partnership with local FSCs, fire protection entities, the California Department of Forestry and Fire Protection (CAL FIRE), and tribal groups within the Planning Units. Where applicable, representatives from each of these groups gave presentations that provided workshop participants with information on how to improve fire-safety within their homes and communities.

Seven of the thirteen Planning Units in Humboldt County contain a local FSC or tribal group which has produced or is in the process of producing a local CWPP specific to the community or communities within those Planning Units. Where these fire-safety groups existed, they played a significant role in shaping the community workshops and enhancing fire awareness among local residents. Many community members in Planning Units with local fire-safety groups demonstrated a high degree of understanding about *hazard mitigation* and fire risks in their communities due to the efforts of their local FSC or tribe. Furthermore, community workshops in these Planning Units tended to be more heavily attended than those without a local fire-safety group. Members of local FSCs and the CWPPs they produced contributed significant amounts of useful, locally specific information, which was incorporated into the following Unit Action Plans.

Most of the countywide community fire planning workshops included a group mapping exercise, which invited participants to help identify *fire hazards*, *protection resources*, and *assets at risk* within the area. Community members also reviewed existing project ideas from the 2006 Humboldt County Master Fire Protection Plan and compiled a list of new wildfire mitigation project proposals. Lists, maps, and descriptions of these community-identified assets, fire hazards, protection resources, and proposed projects are included within each Planning Unit chapter. Each chapter also includes a description of the Planning Unit area, its wildfire environment, its values and assets at risk, community preparedness efforts, fire protection services and capabilities, and evacuation planning in the area.

Unit descriptions provide a general overview of the Unit area. They include characteristics such as local watersheds, primary transportation corridors, central communities, and common land uses within the Planning Unit. This section also contains a list of some of the assets at risk in

each Unit, identified by community members at the CWPP workshops. A map at the end of this section displays the Unit area as well as key aspects within it, such as roads, waterways, fire protection response boundaries, and land ownership patterns. An interactive map displaying this same information is also available on the Humboldt County Web GIS[1] Portal in the Fire Planning section at: http://gis.co.humboldt.ca.us/.

The **Community Process** section provides details pertaining to the community workshops conducted within each Planning Unit, including the dates, locations, groups involved in hosting these meetings, as well as a description of the group mapping exercise and primary discussion points. This section is intended to inform the reader about the origin and generation of the "community-identified" information discussed throughout each Unit Action Plan.

The **Wildfire Environment** section of each Unit Action Plan looks at aspects influencing the Unit's susceptibility to wildfire risks. This section describes the local *vegetation types* and *fire hazard severity zoning* throughout the Unit area. It also examines the region's fire history, including management regimes, wildfire occurrences, and likely *ignition sources*. Finally, this section assesses factors contributing to: *structural ignitability*; accessibility of *ingress and egress* routes; and the availability of *fire protection water* within the communities of these Planning Units. Tables presented towards the end of this section list a sample of community-identified *drafting sites* that may be used to access fire protection water in these areas. A complete list of community-identified wildfire protection resources such as water sources, fire stations, evacuation routes, and emergency assembly sites can be found in the Web GIS Portal mentioned above. A map showing these features is also located at the end of each Unit Action Plan.

The **Values and Assets at Risk** section describes the things within each Planning Unit that are of significant value and importance to the community that can be threatened with destruction or loss from wildfire. Community assets may include structures, such as homes and businesses, as well as environmental values, such as parks and wildlife habitat. Tables in this section list some of the community-identified assets at risk within the Unit.

The **Community Preparedness** section describes activities and efforts undertaken by community members and groups within the Planning Unit to improve fire safety in their neighborhoods. This section acknowledges the endeavors and successes of communities that have formed local FSCs, developed local CWPPs, achieved national *Firewise* recognition, and/or implemented fire hazard reduction programs within their communities, such as Community *Chipper Days* or the *FLASH*[2] program. Contact information for local FSCs is listed in this section where applicable.

The **Wildfire Protection Capabilities** section lists the local, state, and federal fire protection entities that service the communities within each Planning Unit. In addition to outlining the jurisdictional responsibilities, protection priorities, equipment, manpower, and *mutual aid agreements* for each of these entities, this section also describes some of the primary needs and challenges faced by these fire protection services. Contact information for local fire protection services is listed in this section.

The **Evacuation** section of each Unit Action Plan addresses transportation networks and lists the primary access roads to be used in case of emergency evacuation, as well as any additional routes that may offer alternative access. Potential impediments that may hinder emergency access or evacuation within the Unit are listed. This section also offers a brief discussion on the process of designating community evacuation sites and encourages residents to plan ahead for evacuation in the case of a catastrophic wildfire event.

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[1] Geographic Information Systems (GIS).

[2] County of Humboldt, Natural Resources Planning. (2012). FLASH: Fire-adapted Landscapes and Safe Homes. *Humboldt County Fire Safe Council.* Retrieved from www.co.humboldt.ca.us/natural-resources/fire_safe_council/fsc_flash.aspx

The **Community-Identified Projects** portion of these chapters contains a matrix displaying projects proposed by community members to help reduce fire hazards existing throughout the Planning Unit area. In some cases, a list of non-geographic project proposals is also included. Projects were identified by local residents who participated in the group mapping exercise at the CWPP workshops.

The matrix in this section includes information for each proposed project, including all or some of the following descriptors: its location in the community, the acreage, the type of *treatment*, the urgency of the project, the suggested year for completion, types of vegetation to be removed, maintenance required, and potential sources for funding the project. A key that provides a description of each element included in the matrix is available in Appendix G: Descriptive Characteristics for Community Identified Projects Matrix. Each project listed in the matrix has a number corresponding to its location on the project map, which is available at the end of each Unit Action plan as well as within the "Fire Planning" section of the Humboldt County Web GIS Portal: http://gis.co.humboldt.ca.us/. This map also contains the locations of hazard reduction projects that have already been completed within the Unit. Details about these completed projects are not listed in the above mentioned matrix but can be found in the Portal.

The final section of each Unit Action Plan is the actual **Action Plan**, which contains a list of the initial priorities recommended by this countywide CWPP to guide communities in their efforts to improve their fire safety and decrease their vulnerability to wildfire. These action items are suggested based on a combination of input from the community workshops, guidance from County and local FSC members, assessments of local wildfire environments, and in recognition of the needs and capabilities of community members and fire protection services within each Planning Unit.

IV.1. Redwood Park Planning Unit Action Plan

IV.1.1. Redwood Park Planning Unit Description

The Redwood Park *Planning Unit* encompasses 100,020 acres situated in the northwestern corner of Humboldt County. The Unit shares its northern border with Del Norte County and the Yurok Reservation lies to the east. The communities of Big Lagoon and Trinidad are located south of the Unit, along the coast. Highway 101 is the main transportation route through the Unit, which follows the coastline before veering inland just north of Orick and leading through National Park land. The Unit is part of the Redwood Creek *watershed*; the terrain consists of mostly mountainous, forested areas ranging from sea level to about 5,300 feet elevation. Redwood Creek enters into the southeastern portion of the Unit, flowing in a northerly direction towards Orick where it drains into the Pacific Ocean. Major Redwood Creek *tributaries* include Lostman Creek and Prairie Creek, the latter of which flows into Orick from the north.

This Planning Unit consists primarily of parklands and few residential communities exist in the area. The town of Orick comprises the community population center. Located near the coast at the approximate north-south midpoint of the Unit, Orick is a rural town characterized by flat bottomlands with steeply sloping forested hillsides to the east, and the Pacific Ocean to the west. The town is recognized as the "southern Gateway Community to Redwood National and State Parks."[1] Redwood National Park (RNP) dominates approximately three-quarters of the Unit, while the northwestern quadrant of the Unit contains Prairie Creek State Park.

The National Park Service (NPS) primarily manages the land in this Unit. The majority of private-land ownerships are residential and commercial developments clustered around Orick and Highway 101. The northeastern portion of the Unit contains land owned by Green Diamond Resource Company. A map of this Planning Unit can be viewed in Figure IV.1-1. Redwood Park Unit: CWPP Unit Map.

IV.1.2. Redwood Park Community Process Summary

A community workshop was held on June 26, 2012 at the Orick Community Hall for the purpose of gathering local information and garnering public input regarding various factors contributing to the extent of wildfire risk and/or preparedness among the communities in this Unit, and to provide information about the countywide *community wildfire protection plan* (CWPP) update process. Approximately ten community members were in attendance. A group exercise, which involved maps of the Planning Unit area, invited those present to help identify and pinpoint on the map where particular fire hazards exist, the location of protection resources, such as fire water drafting sites, as well as values and assets at risk within the community that could be threatened by wildfire. These workshop processes also provided an opportunity for participating community members to ask questions and provide information based on their local knowledge.

Participants were also asked to review pre-existing information illustrated on the maps which had been added by community members during similar workshops that took place during the initial planning process in 2006. This workshop and mapping exercise also facilitated discussion among community members about potential actions that could be taken to reduce fire risk in their community. Through discussion and collaborative processes, participants identified major hazard areas and compiled lists of project proposals for enhancing their community's fire preparedness.

[1] Humboldt County Department of Community Development Services. (2003, July). *Orick Community Action Plan*. (p.4.) Retrieved from http://www.co.humboldt.ca.us/planning/planning/documents/action_plans/2003_plans/orck_web.pdf

The community-identified fire hazards, protection resources, and values and assets at risk discussed throughout the following sections of this Planning Unit Action Plan reflect information generated by these community workshop mapping exercises, as well as information resulting from direct outreach to local fire departments and residents.

The project proposals resulting from community member discussions are contained in section IV.1.8. Community-Identified Projects in this Planning Unit Action Plan.

IV.1.3. Redwood Park Wildfire Environment

The majority (72%) of the Redwood Park Planning Unit is zoned "High *Fire Hazard Severity*," as determined by the California Department of Forestry and Fire Protection (CAL FIRE).[2] However, the populated areas surrounding Orick, Highway 101, and the central coast region of the Unit are zoned "Moderate Fire Hazard Severity" (12%). Some areas in the north- and south-eastern portions are zoned "Very High Fire Hazard Severity" (15%).

The climate is mostly Mediterranean, with mild, wet winters and warm, dry summers. *Vegetation types* throughout the Unit vary regionally, and there exists a wide diversity of forest types, grassland prairies, oak woodlands, and *riparian* areas containing big-leaf maple, black cottonwood, California bay, red alder, and willow species.

The array of forest types provides a variety of ecosystems for local wildlife within Redwood National Park. The varying *stand compositions* also result in different degrees of vulnerability and *resiliency* to wildfire. The following describes the makeup of these forest types:[3]

- **Old growth forests** are dominated by coastal redwoods and other coniferous trees, including Douglas-fir, grand fir, Sitka spruce, and western hemlock, as well as hardwood species such as tan oak, madrone, big-leaf maple, California bay, and red alder. Understory species include sword fern, rhododendron, huckleberry, azalea and several types of berries.
- **Second growth forests** are naturally predominately redwoods; however, they have been subordinated by Douglas-fir, which was seeded into many logged areas after timber harvests.
- **Dry forests** are mainly Douglas-fir, tan oak, and madrone, although California bay, big-leaf maple, chinquapin, canyon live oak, and poison oak are also common.
- **Alder forests** are found primarily on coastal facing slopes and are dominated by red alder, with big-leaf maple, cascara, willow and coniferous trees interspersed. Several varieties of berries and ferns populate this forest type as well.
- **Sitka spruce forests** are typically in lowlands and coastal areas and are predominantly Sitka spruce, with western hemlock and redwood as well.

Fire management in this Unit has undergone several regime shifts. Native Americans in this region used intentional burning to increase the production of cultural resources, such as acorns and basketry materials, and to influence the growth of particular grasses favored by the deer and elk they hunted for food. White settlers in the mid-1800s also used fire to clear pasture areas for livestock animals. However, when total *fire suppression* became a national policy in the 1930s,

[2]CAL FIRE. (2007). *Fire Resources Assessment Program (FRAP).* [Map showing Fire Hazard Severity Zone ratings within various geographic areas, mapped by county]. Fire Hazard Severity Zones Map. Retrieved from http://frap.cdf.ca.gov/

[3]U.S. Department of the Interior: National Park Service. (2010). *Redwood National and State Parks Fire Management Plan.* (pp.19-21.) Retrieved from http://www.nps.gov/redw/parkmgmt/firemanagement.htm

the *landscape* ecosystems that had developed through centuries of natural and human-caused *ignitions* were fundamentally altered.[4]

Years of fire exclusion along with development and cultivation have enabled the encroachment of Douglas-fir and grand fir into oak woodland and prairies, altering unique wildlife habitat. Some areas of encroachment on oak woodlands have resulted in total conversion to *conifer forest*. Observing these patterns, resource managers and vegetation management staff of the NPS recognized the need for *prescribed fire* to restore and manage these ecosystems, and the park's first prescribed burn was conducted in 1980 in the Bald Hills.[5] The prescribed fire program blossomed throughout the 1990s and evolved to include management of redwood forests, particularly second growth forests. The conifer cutting program involves aggressive removal of encroaching fir in prairies and oak woodlands, and was initiated in 1991. The progress of this program has slowed, however, "due to requirements for increased consultations to ensure compliance with protections for threatened, *endangered*, and *sensitive wildlife species* and cultural resources."[6]

Fire Management in Redwood National Park today is divided, based on ecosystem type, into various Fire Management Units (FMU), including: the Coniferous Forest FMU, the Coastal FMU, the Bald Hills FMU, the Little Bald Hills FMU, the *wildland-urban interface* (WUI) FMU, and the State Parks FMU. Approaches to maintaining these FMUs include a variety of techniques that take into account the "values to be protected" within each area, as well as specific "management considerations," such as the existence of endangered species or the proximity to areas of cultural significance.[7]

Fire events within this Planning Unit between the years 2000-2010 include:

- The Tuk Fire, 2003: 279 acres.
- The Lower Gann's Fire, 2002: 13 acres.
- The Tall Fire, 2009: 5 acres.
- The Overlook Fire, 2008: 2 acres.

Possible *ignition sources* include human-related causes, such as arson, poorly maintained campfires or brush piles, smoking, equipment use, and vehicles or vehicular accidents. Lightning and downed power lines are other potential fire starters in this Unit.

Dead plant matter and vegetation with low *moisture levels* within 100-150 feet of buildings pose some of the greatest threats to *structural ignitability*. Of particular concern are structures with needles and leaves accumulating on rooftops or in rain gutters. Structures with wooden rooftops and sidings add to this risk, as do the presence of wooden decks, particularly those with dead plant matter accumulated beneath them. RNP outposts and ranger stations situated within the forests generally maintain *defensible space* buffers; however, they are often surrounded on all sides by the dense vegetation of the *wildland* in more remote locations, which increases their risk of structural ignitability resulting from wildfire.

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[4] U.S. Department of the Interior: National Park Service. (2010). *Redwood National and State Parks Fire Management Plan.* (p.5.)

[5] U.S. Department of the Interior: National Park Service. (2010). *Redwood National and State Parks Fire Management Plan.* (p.7.)

[6] U.S. Department of the Interior: National Park Service. (2010). Appendix M: Fire Monitoring Plan. *Redwood National and State Parks Fire Management Plan.* Retrieved from http://www.nps.gov/redw/parkmgmt/firemanagement.htm

[7] U.S. Department of the Interior: National Park Service. (2010). *Redwood National and State Parks Fire Management Plan.* (pp.19-40.)

Homes within Orick and along Highway 101, adjacent to state and national park lands could be vulnerable to ignition from *embers* from nearby wildfires. Studies and firefighter experience have shown that homes can be destroyed by flying embers from a wildfire sometimes miles away. If there are places on or around the home for embers to take hold, this increases a home's vulnerability to loss. Based on field observations, there are many homes where steps need to be taken to ensure structure survival when wildfire is nearby. The sawdust and residue from the many redwood carving businesses in this Unit are particularly vulnerable to ignition from burning embers and could spread fire to adjacent residences and community values. Figure IV.1-2 found at the end of this Planning Unit Action Plan illustrates risks and hazards identified by community members at public workshops and can be used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt County Web GIS Portal, "Fire Planning" section: http://gis.co.humboldt.ca.us/.

Highway 101 is the central *ingress and egress* route, with a few smaller roads providing access throughout the parklands and also connecting residences and neighborhoods in the southwestern Unit area to the highway. Although emergency transportation depends heavily on Highway 101, it is a well-maintained road, and few residences exist outside of Orick. Bald Hills Road is also accessible through Orick, if an alternative route were required. The smaller, more remote park service roads lack an alternative ingress/egress route, and the potential for landslides, fallen trees, or downed power lines could create serious complications, for both evacuation and emergency response.

Potable water and *fire protection* services are provided to the residents of this Planning Unit by the Orick *Community Services District*. The District serves a land area of approximately 2.3 square miles and is funded by local taxes, water customer fees, and donations. Critical infrastructure and equipment include: two 100,000 gallon tanks, pumps, a chlorinator, 5 miles of pipeline, 23 hydrants, 132 hook ups, and fire protection equipment.[8] *Fire protection water* may also be drawn from the following locations: [9]

- The Pacific Ocean
- Freshwater Lagoon
- Garland Pond, off of Bald Hills Rd.
- Charlie's Pond
- Pond below Elk Camp Barn
- Community water tanks

The map in Figure IV.1-2 found at the end of this Unit Action Plan illustrates these *drafting sites* as well as other community-identified wildfire *protection resources*. The map can be used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt County Web GIS Portal, "Fire Planning" section: http://gis.co.humboldt.ca.us/.

IV.1.4. Redwood Park Values and Assets at Risk

Assets at risk can be defined as those things that are important to quality of life that can be threatened with destruction or loss from wildfire. These may include community assets such as homes and businesses, as well as environmental values such as wildlife habitat, natural resources, and air quality, along with any other important attribute that individual communities rely on for their well being. Loss or damage to community assets as a result of wildfire can have short- or long-term impacts of varying severity, depending on the asset. Short-term loss caused by a *wildfire* can include the destruction of residences, commercial assets, timber, wildlife habitat,

[8]County of Humboldt, Natural Resources Planning. (2008). *Humboldt Operational Area Hazard Mitigation Plan; Volume 2 – Planning Partner Annexes.* (pp.12-1—12-2.) Retrieved from http://www.co.humboldt.ca.us/natural-resources/hazardmitigation/?inc=finaldraft

[9] County of Humboldt, Natural Resources Planning. (2006, August). Appendix G: Community Identified Values, Protection Resources, Risks and Hazards, and Projects. (p.G-12.) *Humboldt County Master Fire Protection Plan..*

scenic vistas, and *watersheds*. Long-term effects may include displaced persons, smaller timber harvests, reduced access to affected recreational areas, and destruction of cultural, ecological, and economic resources, and community infrastructure.

The majority of *assets at risk* in this Planning Unit are residential homes, along with commercial and service industries, community and town centers, schools, as well as infrastructure components, such as a PG&E substation and the Rodgers Peak Repeater. The map in Figure IV.1-2 found at the end of this Planning Unit Action Plan illustrates values and assets at risk to wildfire identified by community members at public workshops. The map can be used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt County Web GIS[10] Portal, "Fire Planning" section: http://gis.co.humboldt.ca.us/. Some of the community-identified assets at risk within this Unit include: [11]

- Orick Inn
- Cell phone tower, Radio Repeaters (e.g. Rodgers Peak)
- Community Service District office and water pumps
- Orick Fire Hall
- Little Red Inn historic site
- Simpson Mill A

Other assets at risk in this Planning Unit include campgrounds, RNP visitor centers, and *access roads*.

The parklands in this Unit encompass a range of *landscapes* and *ecosystem* types, which provide *habitat* for an array of wildlife. The value of these habitats to the ecological *biodiversity* in this region emphasizes the environmental significance of these parklands. Freshwater Lagoon, and Lady Bird Johnson Grove constitute other environmentally important areas in this Unit.

IV.1.5. Redwood Park Community Preparedness

The Redwood National Park Service (RNPS) has an extensive *Fire Management Plan*, the primary objectives of which are: to ensure the safety of firefighters and people while protecting public and private property, and while protecting the natural and cultural resources of the parks; to use fire as a management tool to meet resource objectives; to manage wildland *fuel* complexes in order to protect values at risk and minimize negative impacts from fire; to cooperate with landowners and land management agencies in fire management activities; to increase the understanding of the role and function of fire in the parks; and "to restore fire as an ecosystem process in the park's *biotic* communities to the fullest extent practical."[12]

The RNPS also has an active *fire prevention* program that includes participation in interagency fire prevention programs at local schools and community events. Trained employees help educate the public about the role of fire within park ecosystems and the mission of the parks' prescribed fire program. They also provide information about how to prevent unwanted fires, emphasizing the distinction between management-ignited fires and unwanted human-caused fires, and illustrating the severe impacts that unwanted fires can have on communities and ecosystems. In addition to the prescribed fire program, the RNPS also has a *mechanical fuels reduction* program.

[10] Geographic Information Systems (GIS).

[11] County of Humboldt, Natural Resources Planning. (2006, August). Appendix G: Community Identified Values, Protection Resources, Risks and Hazards, and Projects. (p.G-12.) *Humboldt County Master Fire Protection Plan.* Retrieved from http://www.co.humboldt.ca.us/natural-resources/fire_safe_council/fsc_mfpp_cwpp.aspx

[12] U.S. Department of the Interior: National Park Service. (2010). *Redwood National and State Parks Fire Management Plan.* (p.15.)

The Fire Management Plan is abetted by the RNP's fire ecology program, which has put forth an elaborate Fire Monitoring Plan that provides monitoring and research support to the Fire Management Plan. This helps ensure that fire protection strategies are well-informed and that fire management is based upon the best available science and knowledge.[13]

Through *hazard mitigation* planning and activities, the community of Orick has successfully achieved Tsunami Ready and Storm Ready status.[14] These initiatives could potentially be springboards for an additional effort to become a *Firewise* Community. Additionally, many of the preparedness activities and outreach associated with these established programs (emergency supply kits, evacuation drills, communitywide communication networks) will benefit residents during a large wildfire event. During the community outreach process in Orick, there was also community interest expressed in possibly forming a local *fire safe council*.

IV.1.6. Redwood Park Fire Protection Level of Service

Community fire protection services are provided through the Orick Community Services District (OCSD) by the Orick *Volunteer Fire Department* (OVFD). The OVFD has 10 volunteers who provide fire protection as well as medical and rescue services to approximately 400 residents in the area. Their *apparatuses* include: one type-1 engine with a 500 gallon capacity, a quick attack engine with 250 gallons, a medium-duty rescue truck, and one 1,800 gallon *water tender*. [15] The OCSD includes a fairly focused community area of 2.3 square miles surrounding Orick. However, it is not uncommon for OVFD firefighters to respond to emergency calls, particularly vehicle accident calls, up and down Highway 101 to the north and south and to the east along Bald Hills Road; the OVFD's total *response area* is approximately 123.8 square miles.[16] The OVFD may be contacted by calling (707) 488-2475, or by visiting the OCSD website: http://www.orickcsd.com/.

The County of Humboldt contracts with CAL FIRE to provide fire protection within *County Service Area* #4 (CSA #4), which covers an area from just north of McKinleyville, near Moonstone Beach, up to the OCSD boundary. CAL FIRE responds from their fire station in Trinidad, which staffs two engine crews in the summer and one crew year-round. They respond to multiple incident types and frequently provide additional support during emergencies within and beyond this Planning Unit. CSA#4 may be contacted by calling (707) 677-3638. Another CAL FIRE station, known as Elk Camp, is located in Orick but is staffed only seasonally, during the declared *fire season*.

RNP staffs two fire engines within their jurisdiction. These resources are equipped for wildland firefighting and can be called out nationwide to respond to wildfires. Their larger wildland engine, which holds five crew members, is staffed from June to October. A smaller engine is staffed year-round. National Park resources will respond to traffic accidents but are primarily staffed to respond to wildfires. They also conduct prescribed burning on National Park Land. The RNP Service may be contacted by calling (707) 464-9150, or by visiting their website at: http://www.nps.gov/redw/index.htm.

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[13] U.S. Department of the Interior: National Park Service. (2010). Appendix M: Fire Monitoring Plan. *Redwood National and State Parks Fire Management Plan.*

[14] County of Humboldt, Natural Resources Planning. (2008). *Humboldt Operational Area Hazard Mitigation Plan; Volume 2 – Planning Partner Annexes.* (p.12-4.) Retrieved from http://www.co.humboldt.ca.us/natural-resources/hazardmitigation/?inc=finaldraft

[15] County of Humboldt, Natural Resources Planning. (2012). *Humboldt County Fire Chiefs Association Annual Report, 2010*. Humboldt County Fire Safe Council. Retrieved from http://www.co.humboldt.ca.us/natural-resources/fire_safe_council/fireserviceannualreport.aspx

[16] Orick Community Services District. (n.d.) *Fire Protection and Emergency Services.* Retrieved September 26, 2012, from http://www.orickcsd.com/p/fire-dept.html

The OVFD participates in the countywide *Mutual Aid Agreement* and provides assistance to and receives aid from other Humboldt County fire service provides. The OVFD also has mutual aid agreements with CAL FIRE and the RNP Service, so that these entities can provide additional support to each other as needed. The OVFD and CAL FIRE often coordinate to provide community fire protection and emergency services within the southern and northern parts of their respective service areas. The OVFD will also respond to calls from the east, along Bald Hills Road, to emergency incidents near the roadway and on private lands on the west side of the Klamath River. These activities are often coordinated with the Yurok Volunteer Fire Company.

The OVFD's priority is structure fires while CAL FIRE and the RNP Service are primarily responsible for *wildland fires* within the Unit. The RNP Service's familiarity with *fire behavior*, informed by experience with its prescribed burn program, enhances their preparedness for managing and addressing wildland fires. The OVFD, CAL FIRE, and RNP resources are dispatched by the Fortuna Interagency Command Center (FICC).

The key issues of concern for the fire services in this Unit are the following:

- Road access during emergency response is sometimes difficult because of road conditions and lack of access permission;
- More volunteers are needed for the OVFD, particularly during the day when many people from within the community are at jobs located outside of Orick;
- Insufficient home address signs can delay emergency response – Kane Road is an example of this (small, difficult to see signs are also a problem);
- Insufficient availability of fire protection water outside the OCSD.

IV.1.7. Redwood Park Evacuation

Evacuation from the Redwood Park Planning Unit will travel either north or south along Highway 101, depending on law enforcement recommendations based on fire behavior, wind pattern, traffic, and ingress of emergency vehicles. Although Highway 101 is the central route through most of the Unit, Newton B Drury Scenic Drive runs parallel to Highway 101 and offers an alternative route through Prairie Creek Redwoods State Park. Bald Hills Road provides access through the southeastern portion of the Unit, eventually connecting with Highway 169. Although Highway 169 is non-continuous and offers limited northern access, it is connected to Highway 96, another major transportation corridor, which offers ingress and egress south towards Willow Creek, and northeast towards Orleans.

Evacuation impediments may include: landslides, fallen trees, downed power lines, overgrown vegetation, poorly marked streets and intersections, and *one-way-in, one-way-out roads* that could inhibit evacuation and emergency response vehicles, or leave residents stranded should the roads become blocked.

During wildfire events that have the potential to threaten personal safety, community evacuation sites may be established where residents can go to survive a wildfire. Evacuation sites will be established in different locations depending on the anticipated path of the wildfire. The determination for the location of these sites is normally made by Humboldt County Emergency Operations Center Incident Commander in cooperation with an *Incident Management Team.* The Humboldt County Sheriffs and Emergency Officials will use mass communication and door-to-door methods to inform residents about the threat and where residents should go to take shelter.

If a catastrophic event occurs, residents may not be able to reach designated evacuation sites. In such cases, residents may need to make decisions on their own about seeking shelter where they can survive the passage of the wildfire until they can reach an evacuation site. It can be very difficult to determine the right thing to do as the fire approaches. Before a wildfire threatens,

community members should talk to their local fire department about evacuation procedures in their neighborhood.

See section V.2.3 in Part V. Fire-Safe Communities for more information on preparing for safe evacuation and evacuation planning for pets and livestock. Also see section II.3.5 Evacuation Routes and Vulnerability in Part II. Risk Assessment for information about evacuation procedures and challenges in Humboldt County.

IV.1.8. Community Identified Potential Projects

The following list and matrix includes community identified proposed projects based on input from the community processes discussed above. A detailed description of each heading in the matrix can be found in Appendix G: Descriptive Characteristics for Community Identified Projects Matrix. These projects are illustrated on the community-identified projects map found at the end of this Unit Action Plan (Figure IV.1-3). Projects include those carried over from the 2006 fire planning process and those identified and refined during the 2012 CWPP update process. This information can also be viewed on the fire planning GIS Portal. The GIS Portal allows users to search for and view specific fire planning features by location or to zoom into a desired area from an aerial view. To access the Portal, go to: http://gis.co.humboldt.ca.us/ and choose "Fire Planning" from the list of mapping applications. The data collected through this planning process are included in the GIS layers within the Portal.

No vegetation *treatments* recommended in this plan will be carried out without the consent and involvement of the property owner and all applicable local, state and federal regulations must be observed.

Non-geographic community identified proposed projects based on community workshop notes:

- Identify and address road access issues wherever possible.
- Install more road and address signs.
- Increase water availability outside Community Services District. Install tanks for firefighting water with proper fittings that are well marked (maybe even mapped).
- Initiate the *Blue Dot Program* within the community. Maybe use GIS students from Humboldt State University as a resource for design.
- Initiate evacuation planning and begin running drills in key areas.
- Replace damaged fire hydrants.
- Hold Community *Chipper Days* (may be able to get someone from Del Norte Fire Safe Council to come down or work with the CAL FIRE Chipper Program).
- Design and implement a fire department recruitment strategy to get more volunteers (volunteers who can respond during the day are especially needed).

LOCATION		Treatment/Project Information Eel Fire Planning Unit							
Number Corresponds with location on map	**Community, Structure, or Area (Value at Risk)**	**Description**	**Status**	**Year**	**Type**	**Acres**	**Veg Type**	**Maintenance (actual or proposed)**	**Funding source (actual or proposed)**
ORI036	Riverview Road, W of Hwy 101	Fix Riverview Road Access - Private drive, mitigate stream diversion issues	Action Need	2012	Other - Access	0			grant-landowner-Assn.
ORI037	Gunst Road	Gunst Rd - road thinning for access	Treat-Med	2010	Roadside Clearance	0			grant-landowner-Assn.
ORI038	Redwood Creek, Orick	Levee vegetation - brush clearing / burning as needed	Treat-Med	2012	Other - Creek Side	0			grant-landowner-Assn.
ORI039	Bald Hills Road	Stop burning at Redwood National Park at Bald Hills in Summer	Action Need	0	Other - Burning	0			grant-landowner-Assn.
ORI040	Hwy 101 & Barnum St	Remove fence at Haygoods & Elkhorn to improve access - Wrk w/Property Owner	Action Need	2012	Other - Access	0			grant-landowner-Assn.
ORI041		Additional Hydrants in the Blocks	Action Need	0	Other - Water	0			grant-landowner-Assn.
ORI043	Old State Highway	Owl Gulch brush clearing (in conjunction w/ chipper days)	Treat-Med	2010	Defensible Space and Roadside Clearance	17.94			grant-landowner-Assn.

Humboldt County Community Wildfire Protection Plan

LOCATION		Treatment/Project Information Eel Fire Planning Unit							
Number Corresponds with location on map	**Community, Structure, or Area (Value at Risk)**	**Description**	**Status**	**Year**	**Type**	**Acres**	**Veg Type**	**Maintenance (actual or proposed)**	**Funding source (actual or proposed)**
ORI045	Old State Highway, Eris Ln, Hiltons Rd	Hilton brush clearing (in conjunction w/ chipper days)	Treat-High	2012	Defensible Space	22.62			grant-landowner-Assn.
ORI047	Gunst Road	Gunst Rd neighborhood brush clearing (in conjunction w/ chipper days)	Treat-Med	2010	Defensible Space	13.99			grant-landowner-Assn.
ORI048	Hufford Road	Hufford brushing (in conjunction w/ chipper days)	Treat-Med	2010	Landscape	18.35			grant-landowner-Assn.
ORI049	Riverview Road	Riverview neighborhoods brush clearing (in conjunction w/ chipper days)	Treat-Med	2010	Defensible Space	17.79			grant-landowner-Assn.
ORI050	Foothill Road and Viewcrest Drive	Foothill neighborhoods brush clearing (w/ chipper days) - Viewcrest Dr./Foothill	Treat-Med	2012	Defensible Space	23.83			grant-landowner-Assn.
ORI053	Old State Hwy, E of Hwy 101	Post more address signs to facilitate emergency response	Action-Needed	2012	Other - Signage				

Humboldt County Community Wildfire Protection Plan

LOCATION		Treatment/Project Information Eel Fire Planning Unit							
Number Corresponds with location on map	**Community, Structure, or Area (Value at Risk)**	**Description**	**Status**	**Year**	**Type**	**Acres**	**Veg Type**	**Maintenance (actual or proposed)**	**Funding source (actual or proposed)**
ORI054	Robinson Rd, W of Hwy 101	Post more address signs to facilitate emergency response	New	2012	Other - Signage				

IV.1.9. Redwood Park Action Plan

The following items are the initial priorities for community action for the Redwood Park Planning Unit as recommended by this Humboldt County CWPP (not listed in order of priority). In an ideal world, everything recommended here would be implemented. However, it must be understood that implementation will be subject to the availability of funds and other resources and the willingness/ability of community members and Plan Partners to take action. This Action Plan can be cited in grant applications to leverage needed implementation funds and used to guide and inspire action.

Enhancing Fire Protection

- **Sustainable Fire Departments:** Community members within this Planning Unit should support their local fire department through activities such as volunteering as firefighters or auxiliary members, making donations, supporting fundraisers, writing grants, and/or helping with administrative tasks. With community support, local fire departments can continue to provide a wide variety of vital emergency services. Focus initial efforts on the following priority:
  - Develop a strategy for recruiting more volunteer firefighters.
- **Road Improvements:** Upgrade and/or repair roads that hinder access by emergency responders. Begin by systematically identifying and mitigating such access impediments. Also, take into consideration privately owned roads, the use of which may be necessary during emergency situations; work with property owners to ensure access availability. The following priority access issues were identified at a community workshop and are recommended for initial action in this plan:
  - Fix access on private drive along Riverview Road. Mitigate stream diversion issues as well. If property owners can not resolve disagreements about an approach to this, consider alternative routes or methods.
  - Remove fence at Haygoods & Elkhorn to improve emergency access.
- **Signage:** To aid emergency responders, residents and road associations should improve road and address *signage* throughout their communities. Make signs larger and reflective to increase visibility and install road and address signs where they are missing. Less noticeable but more sentimental address signs may remain but it is important to also post reflective signs with lettering at least three inches in height. Focus initial efforts in the following areas:
  - Robinson Road, west of Highway 101.
  - Old State Highway, east of Highway 101.
- **Firefighting Water:** Increase the availability of water for fire protection by making water access locations known to fire departments and investing in more community water tanks. Neighborhood and road associations and/or Firewise Communities work with local fire departments to develop a "Blue Dot" program, which identifies the location of firefighting water sources by marking them with a blue reflective dot. This program also ensures that tanks and water systems are outfitted with fittings compatible with firefighting equipment. Begin by identifying where such a program is most needed. Focus initial efforts in the following areas:
  - Neighborhoods outside of the Community Service District boundaries.

Creating Fire Safe Communities

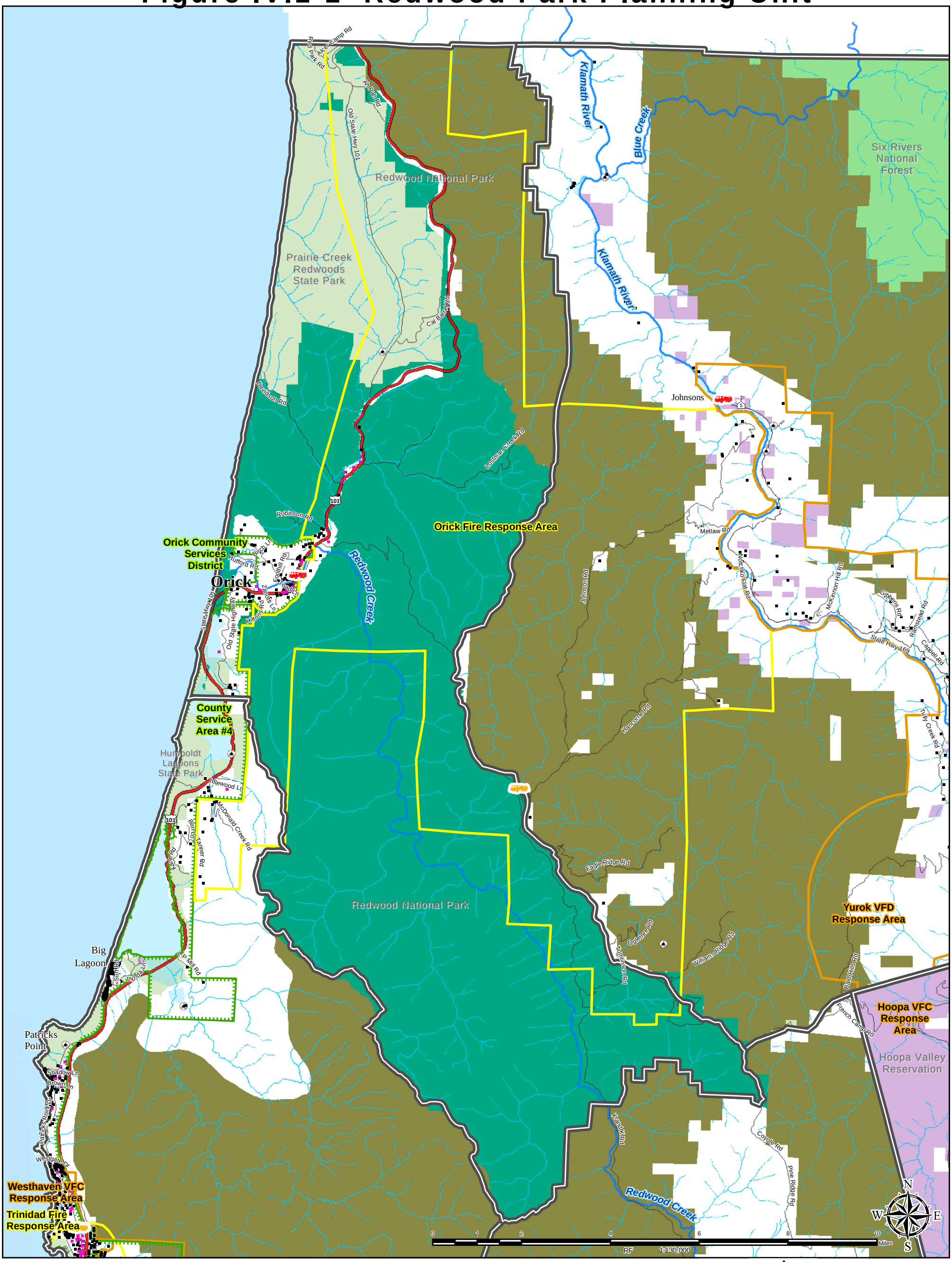
- **Firewise Communities:** Pursue participation in the Firewise Communities/USA recognition program with neighborhood groups in developed areas adjacent to the

wildland. Actively implement and maintain the Firewise action plan on an annual schedule.

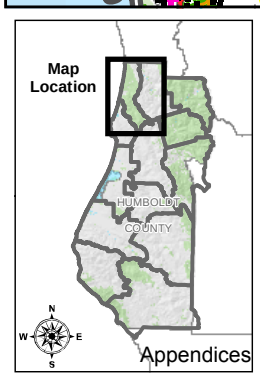
Reducing Wildfire Fuels (Flammable Vegetation)

- **Defensible Space:** Those residents living in areas within this planning unit that are at risk to wildfire should manage the flammable vegetation within their *Home Ignition Zone*. Maintaining *defensible space* through vegetation treatments should be a routine and ongoing practice for all homes and landscapes. Community *Chipper Days* can facilitate this process by helping landowners get rid of *slash* and *brush* piles so that they do not become an additional hazard. Begin by identifying where defensible space is most needed within the planning unit. The following priority areas were identified at community meetings and are recommended for treatment in this plan:
  - Neighborhoods along Hufford Road, west of Orick.
  - Neighborhoods along roads branching off of Hufford Road, including: Foothill Drive, Viewcrest Drive, and Gunst Road.
  - Neighborhood along Riverview Road, north of Orick.
- **Roadside Clearance:** Manage roadside vegetation in order to improve and maintain access for emergency vehicles and ensure safe evacuation. Consider working with the California Conservation Corps or County Public Works Roads Division. Focus initial efforts along the following roads:
  - Brush thinning along Gunst Road.
  - Collaborate with the Public Works Roads Division to better understand and provide input to the process of setting priorities for roadside vegetation maintenance.
- **Landscape Fuels Reduction:** Construct *shaded fuelbreaks* as buffers between residential areas and wildlands to slow the progress of wildfires. This allows firefighters a higher probability of successfully protecting communities from wildfire damage. These buffers may also protect the wildlands from the spread of fires originating within communities. The following are recommended for priority treatment in this plan:
  - Areas along Hufford Road, west of Orick; ideally, this project should correlate with Chipper Days.

Figure IV.1-1 Redwood Park Planning Unit



CWPP Unit Map



Legend

CWPP Planning Unit Boundary

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

Local Fire Organization Response Area
- District
- Out of District
- Non-Tax (Volunteer Fire Company (VFC))
- Proposed District Annexation Area (PDAA)

Improved Parcels
- Improved Parcel (not actual location of improvement)
- Commercial or Industrial Lot (not actual location)

Airports
- Landing Strip

Highways and Roads
- HWY 101
- State HWY
- HWY or Secondary Road
- Local Road or Street

Hydrography
- Major River or Stream

Infrastructure
- Gauging Station
- Water Tank or Source
- Historic Locations

Land Ownership

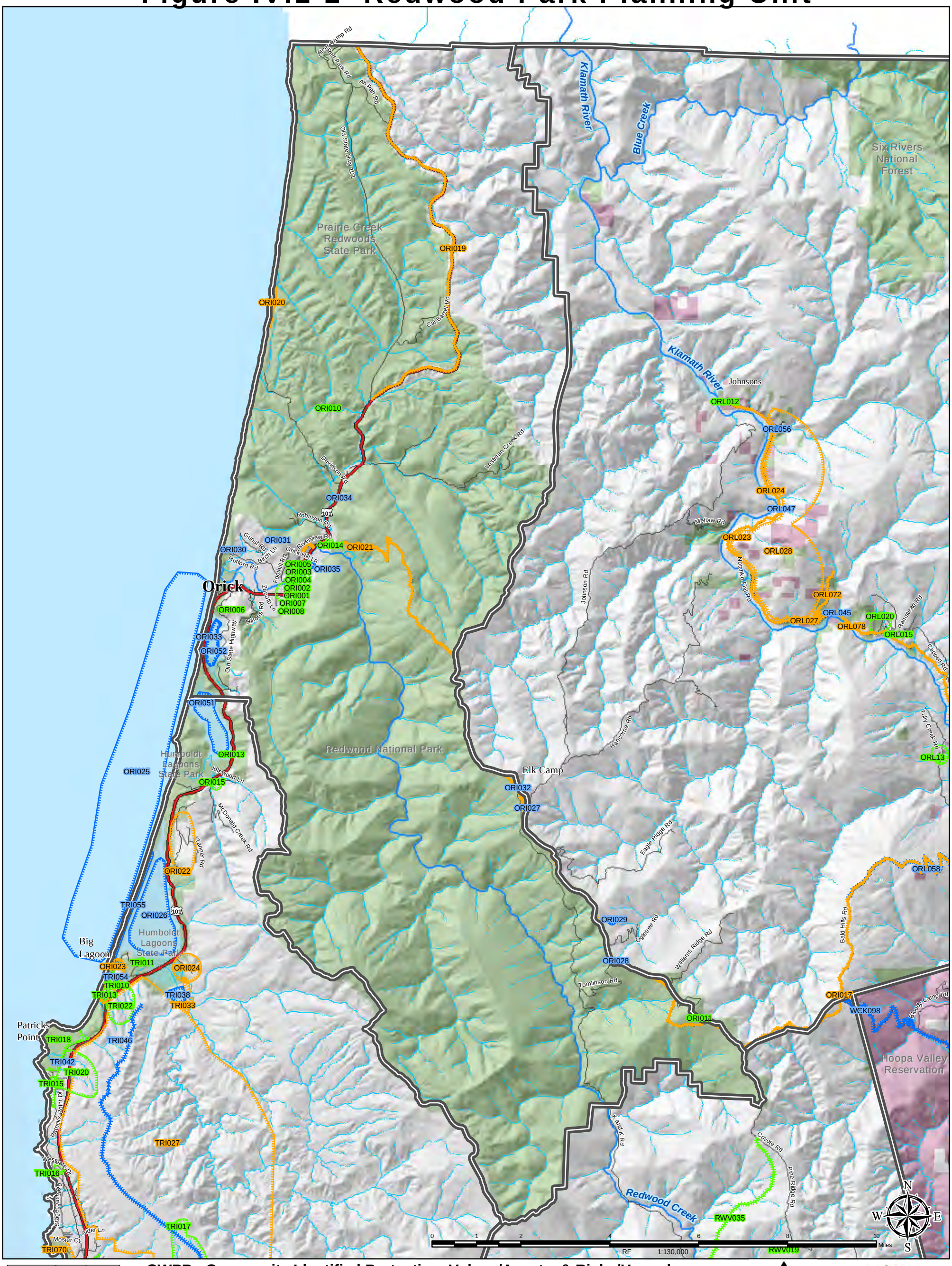
AGENCY
- Bureau of Land Management
- National Park Service
- State Park or Other State Lands
- Six Rivers National Forest
- U.S. Fish and Wildlife Service
- Tribal Lands
- Private
- Industrial Timber
- Cities

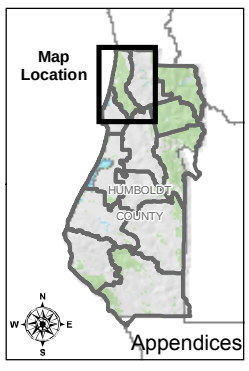
Land ownership and infrastructure data has been compiled by The County of Humboldt. Fire planning features identified at community workshops by residents; local, state, and federal fire service personnel; and Humboldt County staff. Other data sources were the 2006 Humboldt County Master Fire Protection Plan

This map is intended for planning purposes and should not be used for precise measurement or navigation.

Map compiled by County of Humboldt, March 2013
Online maps visit: http://gis.co.humboldt.ca.us
Contact: cimmit@co.humboldt.ca.us or jvondohlen@co.humboldt.ca.us

Figure IV.1-2 Redwood Park Planning Unit





CWPP - Community Identified Protection, Values/Assets, & Risks/Hazards

Legend

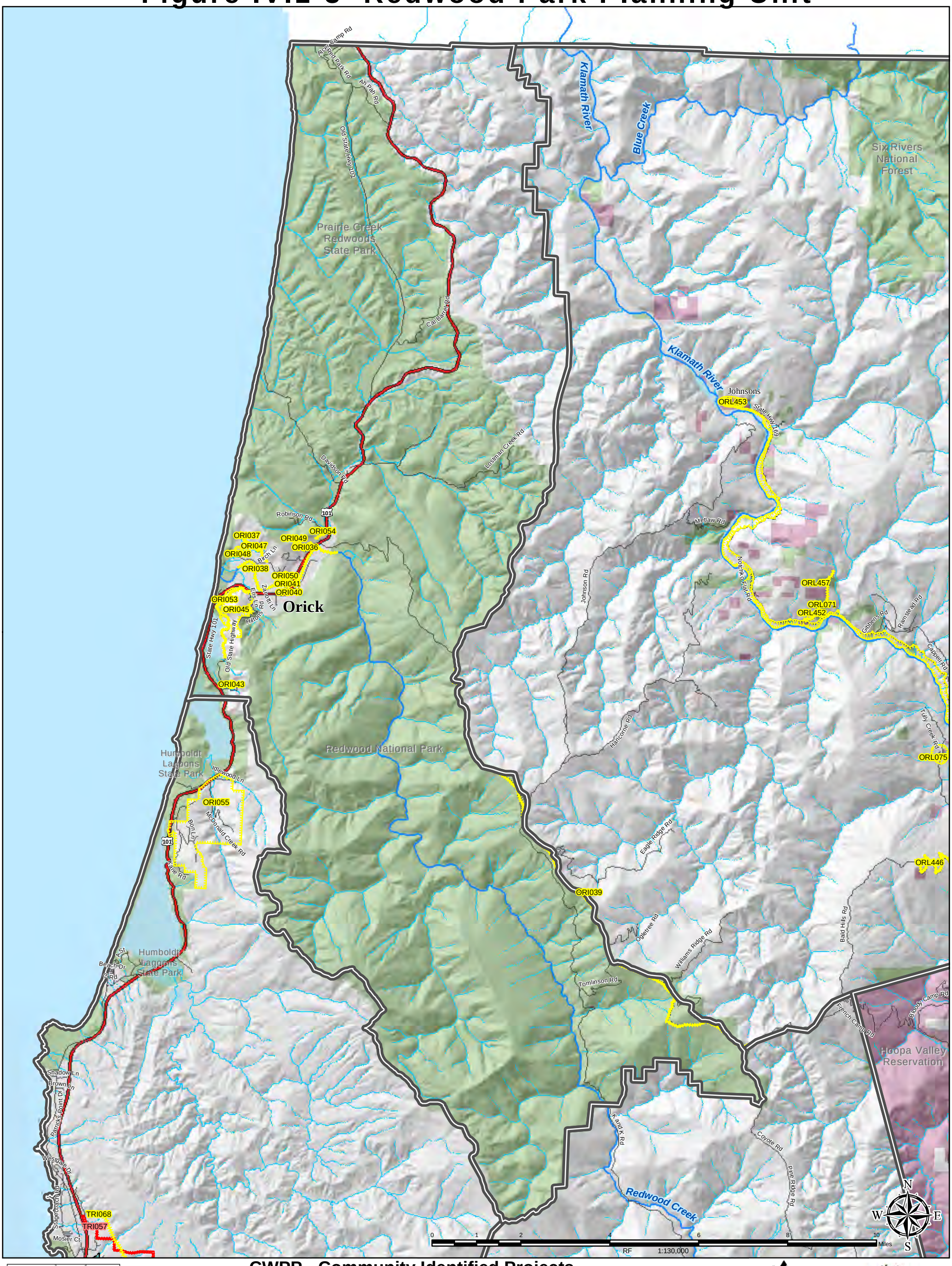
- CWPP PlanningUnit Boundary
- **Community Identified Features**
  - Protection/Evacuation
  - Value/Asset
  - Risk/Hazard
- **Land Ownership**
  - Parks/Public Land
  - Reservation/Tribal Land
  - Cities
- **Highways and Roads**
  - HWY 101
  - State HWY
  - HWY or Secondary Road
  - Local Road or Street
- **Hydrography**
  - Major River or Stream
  - Perennial Stream
  - Intermittent Stream

Land ownership and infrastructure data has been compiled by The County of Humboldt. Fire planning features identified at community workshops by residents; local, state, and federal fire service personnel; and Humboldt County staff. Other data sources were the 2006 Humboldt County Master Fire Protection Plan

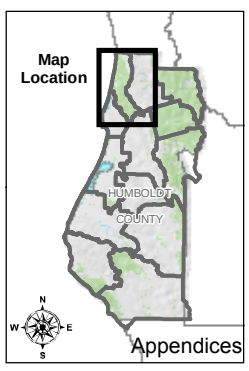
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Contact: cimmit@co.humboldt.ca.us or jvondohlen@co.humboldt.ca.us

Figure IV.1-3 Redwood Park Planning Unit



CWPP - Community Identified Projects



Legend

- CWPP Planning Unit Boundary
- **Community Identified Projects**
  - Proposed Project
  - Treated Project
- **Land Ownership**
  - Parks/Public Land
  - Cities
- **Highways and Roads**
  - HWY 101
  - State HWY
  - HWY or Secondary Road
  - Local Road or Street
- **Hydrography**
  - Major River or Stream
  - Perennial Stream
  - Intermittent Stream

Land ownership and infrastructure data has been compiled by The County of Humboldt. Fire planning features identified at community workshops by residents; local, state, and federal fire service personnel; and Humboldt County staff. Other data sources were the 2006 Humboldt County Master Fire Protection Plan

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Map compiled by County of Humboldt, March 2013.
Online maps visit: http://gis.co.humboldt.ca.us/
Contact: cimmit@co.humboldt.ca.us or jvondohlen@co.humboldt.ca.us

IV.2. Up River Planning Unit Action Plan

IV.2.1. Up River Planning Unit Description

The Up River *Planning Unit* encompasses 150,722 acres situated in north-central Humboldt County. Redwood National Park lies to the west, Del Norte County to the north, Six Rivers National Forest lines the eastern border, and the Hoopa Valley Reservation is located to the south. The geography of the Unit is characterized by the Klamath River *basin* and its many *tributaries*, which include: [1]

- Mettah Creek
- Pecwan Creek
- Coon Creek
- Halagow Creek
- Roach Creek
- Ah Pah Creek
- Notchko Creek
- Bear Creek
- Achelth Creek
- Surpur Creek
- Pine Creek
- Blue Creek

Highway 169 is the main transportation corridor, following the Klamath River in a north-south direction across the Unit. However, it is important to note that Highway 169 is a non-continuous route, which comes to a dead-end near the Johnsons community in the northern portion of the Planning Unit.

The heart of the Unit area falls within the Yurok Tribe's Territory, which consists entirely of Ancestral Lands, specifically including, but not limited to, the Yurok Reservation; the Reservation extends one mile out on each side of the Klamath River, from the mouth of the river to an upriver distance of about 44 miles. The Yurok Indian Reservation is comprised of 63,035 acres spanning Humboldt and Del Norte Counties. The Yurok Tribe is the largest Indian Tribe in California, with over 5,000 enrolled members. The entire Reservation has a population of approximately 2,100.[2]

The majority of communities in this Planning Unit are largely contained within the *up-river* portion of the Reservation; the *down-river* portion of the Reservation is located in Del Norte County. The *up-river* area (the Humboldt County portion of the reservation) includes several small communities or villages; they are:

- Weitchpec
- Tulley Creek
- Notchco
- Pecwan
- Bald Hills
- McKinnon Hill
- Ke'pel
- Wautec

Based on the communities at risk analysis conducted by the California Fire Alliance, all of the communities listed above have been identified by the Yurok Tribe as "*communities at risk* for

[1]Dyett & Bhatia. (2002, September). Lower Klamath Watershed. *Humboldt 2025 General Plan Update: Natural Resources and Hazards; Vol. 2: Detailed Watershed Characteristics and Regulatory Framework Analysis.*(p.43.) Retrieved from http://www.co.humboldt.ca.us/gpu/documentsbackground.aspx..

[2] County of Humboldt, Natural Resources Planning. (2008). *Humboldt Operational Area Hazard Mitigation Plan; Volume 2 – Planning Partner Annexes.* (pp.2-13—2-14.) Retrieved from http://www.co.humboldt.ca.us/natural-resources/hazardmitigation/?inc=finaldraft

wildfire."[3] Weitchpec--situated in the southeastern corner of the Unit near the confluence of Highways 169 and 96-- is the hub of community life in this Planning Unit. Weitchpec contains the Yurok Tribal Office and Community Center, where many community services are located and events take place.

While much of the Reservation is owned by the Yurok Tribe, a substantial amount of land within the Planning Unit is privately owned as well. Private lands include residential parcels, large tracts of ranchlands, and industrial timberlands. A small section of the northeastern portion of the Unit falls within Six Rivers National Forest boundaries and is therefore managed by the U.S. Forest Service. Only a small portion of the Yurok Reservation has been developed for residential housing, and much of that lacks basic services such as electricity and telephone service.[4] A map of this planning unit can be viewed in Figure IV.2-1. Up-River Unit: CWPP Unit Map.

IV.2.2. Up River Community Process Summary

An open-house community workshop was held on June 20, 2012 at the Weitchpec Community Center for the purpose of gathering local information and garnering public input regarding various factors contributing to the extent of wildfire risk and/or preparedness among the communities in this Unit, and to provide information about the countywide community wildfire protection plan (CWPP) update process. The workshop was held in conjunction with the Yurok Tribe and their consultants, Tetra Tech, and the information gathered will inform both this plan and the local Yurok CWPP; approximately 25 community members were in attendance. A group exercise, which involved maps of the Planning Unit area, invited those present to help identify and pinpoint on the map where particular *fire hazards* exist, the location of *protection resources*, such as fire water drafting sites, as well as values and *assets at risk* within the community that could be threatened by wildfire. These workshop processes also provided an opportunity for participating community members to ask questions and provide information based on their local knowledge.

Participants were also asked to review pre-existing information illustrated on the maps which had been added by community members during similar workshops that took place during the initial planning process in 2006. This workshop and mapping exercise also facilitated discussion among community members about potential actions that could be taken to reduce fire risk in their community. Through discussion and collaborative processes, participants identified major hazard areas and compiled lists of project proposals for enhancing their community's fire preparedness.

The community-identified fire hazards, protection resources, and values and assets at risk discussed throughout the following sections of this Planning Unit Action Plan reflect information generated by these community workshop mapping exercises, as well as information resulting from direct outreach to local fire departments and residents.

The project proposals resulting from community member discussions are contained in section IV.2.8. Community-Identified Projects in this Planning Unit Action Plan.

IV.2.3. Up River Wildfire Environment

Approximately 87% of the Up River Planning Unit is zoned "Very High *Fire Hazard Severity*," as determined by the California Department of Forestry and Fire Protection (CAL

[3] Tetra Tech: Prepared for Yurok Tribe. (January 2013). Chapter 13 Community Wildfire Protection Plan (p.13-13). *Yurok Tribe Hazard Mitigation Plan, Draft 3*. Klamath, CA. Retrieved from http://yuroktribe.org/departments/planning/documents/Yurok_Tribe_HMP&CWPP_2013-01-16.pdf..

[4] County of Humboldt, Natural Resources Planning. (2008). *Humboldt Operational Area Hazard Mitigation Plan; Volume 2 – Planning Partner Annexes.* (pp.2-13—2-14.)

FIRE).[5] However, several small areas throughout the Unit, particularly in the southern region near Pine Creek and Weitchpec, and surrounding Highway 169 are zoned "High Fire Hazard Severity" (totaling 11%). The Unit area is largely comprised of rugged, steep forest land with valleys and *drainages* running from the mountainous regions toward the ocean. The steep slopes within this Unit can increase *fire risk* by accelerating the rates at which fires spread uphill; these slopes can have topographical influences on wind patterns as well.

The Unit is characterized by cold, wet winters and hot, dry summers. The land is predominantly forested, with Green Diamond Resource Company timberlands and other lands zoned for timber production covering a majority of the area. *Vegetation types* include forest communities such as mixed *conifer forests*, with fir and pine, as well as redwood *stands*, oak woodlands, and *chaparral*. The forestlands surrounding the eastern and western sides of the Unit are predominantly mixed conifer, coastal redwoods, Douglas-fir, spruce, and intermixed hardwoods, including madrone and tanoak. Vegetative *fuel* types throughout the Unit include *brush*, hardwood *litter*, *understory*, as well as *slash* and closed timber litter left from previous logging operations. During the hot summer months, the abundant vegetation in this region dries out and increases *hazardous fuel* levels.

Ecosystems and *plant communities* in this region are historically adapted to wildfire occurrence to the extent that some varieties are not only fire-tolerant but *fire-dependent* for healthy *ecosystem functioning*. In the past, Yurok tribal members implemented intentional burns throughout the Reservation area for ecological and cultural purposes. However, a history of *fire suppression* beginning in the 1930s has allowed the accumulation of dense, flammable vegetation in the forest understory. This vegetation can fuel wildfires and increases the risk of high-intensity burns. The exclusion of fire from these *landscapes* adapted to low-intensity fires that would burn off brush and newer starts in the understory has led to overcrowding of forests, accumulated fuels, and alterations in *species compositions* and forest structure. This ecosystem dynamic is creating risk for *wildfires* of greater intensities and on a larger scale than the local vegetation is adapted to withstand. The extent that the landscape has been altered as a result of fire suppression is reflected in the *condition class* of the Unit area. Condition class describes the degree of departure from the historical natural *fire regime*. Where the condition class indicates that fire has been absent for an unnaturally long time, the hazard and potential damages are high to both the environment and human developments in the area. Approximately 50% of the Up River Planning Unit is condition class 3, meaning the fire regime is significantly altered from the historical range; and approximately 39% of the area is condition class 2, or moderately altered from the historical range.

On average, there are between ten and twelve brush fires each year on the Yurok Indian Reservation.[6] Fortunately, despite its "Very High" fire hazard severity zoning, there have been few fire events in the Unit within the past decade. These fire events include:

- The Tectah Fire, 2003: 97 acres.
- The Johnson Fire, 2003: 5 acres.
- The Cappel Fire, 2007: 13 acres.

Fires in the lands adjacent to this Planning Unit have impacted residents of the Reservation as well. The Megram Fire in November, 1999 was located approximately 60 miles east of Weitchpec, and generated dense smoke and ashes which spread throughout Northern California,

[5] CAL FIRE (California Department of Forestry and Fire Protection). (2007). *Fire Resources Assessment Program (FRAP).* [Map showing Fire Hazard Severity Zone ratings within various geographic areas, mapped by county]. Fire Hazard Severity Zones Map. Retrieved from http://frap.cdf.ca.gov/

[6] Tetra Tech: Prepared for Yurok Tribe. (January 2013). Chapter 13 Community Wildfire Protection Plan (p.13-44). *Yurok Tribe Hazard Mitigation Plan, Draft 3*.

decreasing visibility and air quality. Many people were evacuated from the Reservation at this time, due to health concerns. Similarly, the Biscuit Fire in July 2002, which began in Southern Oregon as a result of lightning strikes, generated smoke that created health problems for residents within a 100-mile radius. [7]

Possible *ignition sources* within this Unit include human-related causes, such as arson, campfires, brush piles, smoking, playing with fire, equipment use, and vehicle accidents, as well as lightning and downed power lines.

Communities in this Unit exist within the *wildland-urban interface* (WUI), where there is an increased likelihood that *structural fires* will be able to spread into the wildlands, and vice versa. *Dead plant matter* and vegetation with low *moisture levels* within 100-150 feet of homesteads pose some of the greatest threats to *structural ignitability*. Of particular concern are houses with needles and leaves accumulating on rooftops or in rain gutters. Houses with wooden rooftops and siding add to this risk, as do the presence of wooden decks, particularly those with dead plant matter accumulated beneath them. These items are generally more susceptible to combustion from *embers* or radiant heat and, if lighted, could cause the rest of the home to catch fire as well. Figure IV.2-2 found at the end of this Unit Action Plan illustrates risks and hazards identified by community members at public workshops and can be used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt County Web GIS Portal, "Fire Planning" section: http://gis.co.humboldt.ca.us/.

Highway 169 is the central *ingress and egress* route; however, its use in emergencies should be cautioned with the knowledge that this is a non-continuous route that dead ends in the northern portion of the Unit, far from any other major roads. The abrupt end of the primary access route in this Unit exacerbates risks associated with the remoteness of homes in this area and limits residents' options for evacuation. A number of smaller roads branching off Highway 169 connect residences and neighborhoods to the main highway. Poor or complete lack of *signage* at these roads and at intersections pose potential problems for emergency responders; this is especially true for more remote residences further away from any community center. The narrowness of smaller roads leading to remote residences could create serious complications for emergency vehicles trying to gain access during simultaneous home evacuations. Many roads are also grown over with vegetation, and some properties have inadequate vehicle t*urn around spaces*. The potential for landslides in the area could also inhibit access.

The Public Utilities Division within the Yurok Tribe's Planning and Community Development Department provides potable water and *fire protection water* to residents throughout the Reservation. Fire protection water may also be drawn from the following locations:

- Pine Creek
- Burrill Creek
- Garland Pond
- Charlie's Pond
- Gist Creek
- School Creek
- Rube Ranch
- Ha Amar Creek
- Klamath River at Martin Ferry Bridge

However, these smaller, cold water creeks are extremely valuable to fisheries health in the area, and fire fighters should always attempt to *draft* fire protection water from the river prior to accessing the cooler creeks.

[7] Tetra Tech: Prepared for Yurok Tribe. (January 2013). Chapter 13 Community Wildfire Protection Plan (p.13-41). *Yurok Tribe Hazard Mitigation Plan, Draft 3*.

The map in Figure IV.2-2 found at the end of this Planning Unit Action Plan illustrates these *drafting sites* as well as other community-identified wildfire *protection resources*. The map can be used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt County Web GIS Portal, "Fire Planning" section: http://gis.co.humboldt.ca.us/.

IV.2.4. Up River Values and Assets at Risk

Assets at risk can be defined as those things that are important to quality of life that can be threatened with destruction or loss from wildfire. These may include community assets such as homes and businesses, as well as environmental values such as wildlife habitat, natural resources, and air quality, along with any other important attribute that individual communities rely on for their well being. Loss or damage to community assets as a result of wildfire can have short- or long-term impacts of varying severity, depending on the asset. Short-term loss caused by a *wildfire* can include the destruction of residences, commercial assets, timber, wildlife habitat, scenic vistas, and *watersheds*. Long-term effects may include displaced persons, smaller timber harvests, reduced access to affected recreational areas, and destruction of cultural, ecological, and economic resources, and community infrastructure.

The majority of *assets at risk* in this Planning Unit are residential homes along with commercial and service industries, community facilities, schools, fire stations, as well as infrastructure components, such as communications towers, power lines, and bridges. Commercial assets at risk in this Planning Unit include timber *stands* and livestock.

The map in Figure IV.2-2 found at the end of this Planning Unit Action Plan illustrates values and assets at risk to wildfire identified by community members at public workshops. The map can be used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt County Web GIS[8] Portal, "Fire Planning" section: http://gis.co.humboldt.ca.us/. Some of the community-identified assets at risk within this Unit include:

- Yurok Tribal Office
- Weitchpec Water Tanks
- Lyon's Ranch Barns –Historical
- Gibbons Road Water/Power

The Reservation contains many culturally significant ancestral territories, which are often also areas of environmental significance. Protecting these spaces is a top priority for communities in this Planning Unit. Currently, the Yurok Tribe is partnering with the Western Rivers Conservancy to help conserve the Blue Creek *watershed* by buying 47,000 acres from Green Diamond Resource Company. Blue Creek is a vital tributary to the lower Klamath River that provides high-quality spawning *habitat* for *endangered* chinook and coho salmon as well as steelhead trout. This project will help restore salmon runs and will benefit the watershed, which provides valuable habitat for other important wildlife species, such as marbled murrelets, northern spotted owls, deer, and bears. Equally important, this project will help re-establish a homeland and economic base for the Yurok Tribe.[9]

IV.2.5. Up River Community Preparedness

In May 2006, The Yurok Tribe *Hazard Mitigation* Plan (HMP) reached completion. The purpose of the plan was to: "identify hazards, establish community goals and objectives, and select mitigation activities that are appropriate for the Yurok Indian Reservation."[10] Now, in

[8] Geographic Information Systems (GIS).

[9] Western Rivers Conservancy. (n.d.). *Blue Creek Salmon Sanctuary and Yurok Tribal Reserve*. Current Projects: California. Retrieved November 28, 2012, from http://www.westernrivers.org/pages/blueCreek.html

[10] Yurok Tribe, Planning and Community Development. (2006, May 25). *Yurok Tribe Hazard Mitigation Plan.* (p.3.) Retrieved from

2012, this hazard plan is being updated and the updated version will include a *community wildfire protection plan* (CWPP).

The Yurok Tribe is working towards establishing a local *fire safe council* (FSC) to guide the CWPP development and implementation process. This group will help educate residents about *fire safety* and wildfire preparedness. The Tribe recruited potential FSC members from the HMP update Steering Committee. The planning process involved a compilation of efforts from various groups and agencies from throughout the planning area that came together in an effort to address the mitigation of wildfire hazards to communities at risk.

"The CWPP is intended to serve as the guiding document for reducing the risk of fire to the Yurok Reservation and its surrounding communities and to serve the following uses:

- Promote fire safety;
- Build capacity of local fire organizations;
- Coordinate local activities with the federal and state agencies charged with *fire protection* and management responsibilities;
- Incorporate planning for fire safe communities into the County land use planning process;
- Provide planning tools for fire safe communities;
- Identify funding sources to support local organizations that provide fire prevention and protection services."[11]

IV.2.6. Up River Wildfire Protection Capabilities

Community fire protection within the Unit is provided by the Yurok *Volunteer Fire Company* (YVFC). The YVFC was formed in 2004 with support from grant funds to build two fire stations. Funding, equipment and facilities are provided by the Yurok Tribe. The YVFC operates out of two fire stations--one in Weitchpec and one in Wautec--and serves an area of 80 square miles, with approximately 350 residents. The YVFC is made up of ten volunteers who respond to structural and *wildland fires*, as well as calls for medical and rescue services. In addition to responding to emergency calls, the YVFC also works with the Yurok Reservation Community, providing fire suppression service for cultural burns. The YVFC also provides services during tribal ceremonies and cultural events. Their *apparatuses* include: a type-2 engine, a type-4 wildland engine, and a rescue truck.[12] The YVFC may be reached by calling (530) 625-9232.

There is also the Yurok Wildland Fire Crew, which operates out of Tulley Creek where there is a fire station that was built with the assistance of FEMA grant funds. In addition to the YVFC, the Yurok Wildland Fire Crew and CAL FIRE also respond to fires within this Planning Unit. The YVFC has a *mutual aid agreement* with CAL FIRE, and emergency calls typically dispatch YVFC volunteers as well as the CAL FIRE engine from Elk Camp on Bald Hills Rd. Response times can range anywhere from one to two hours, depending the incident site.[13] The CAL FIRE Elk Camp station can be reached by calling (707) 499-2240.

Water availability can be a challenge for firefighters in this Unit. There are six hydrants located within this Planning Unit, although they are seldom used because of concerns about

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http://yuroktribe.org/departments/planning/documents/Yurok_Hazard_Mitigation_Plan_ApprovedMay252006.pdf.

[11] Tetra Tech: Prepared for Yurok Tribe. (January 2013). Chapter 13 Community Wildfire Protection Plan (p.13-2). *Yurok Tribe Hazard Mitigation Plan, Draft 3*.

12 Humboldt County Fire Chiefs Association. (2012). 2012 Local Fire Protection Survey.

13 Tetra Tech: Prepared for Yurok Tribe. (January 2013). Chapter 13 Community Wildfire Protection Plan (p.13-10). *Yurok Tribe Hazard Mitigation Plan, Draft 3*.

potential damage to waterlines, depleting water available for residential use, and worries that drafting water out of cold streams could compromise their ecological benefits on the Reservation. According to the 2006 Yurok HMP:

> "A lack of fire hydrants, adequate water storage and modern fire suppression equipment inhibit the effect fire suppression efforts. When fire strikes, structures are almost always at a total loss. In most cases, structures are uninsurable due to the lack of adequate fire hydrants and water storage. Without increased fire suppression equipment, adequate water storage and hydrants, it is anticipated that structural fires on the Reservation would continue and create a greater risk of wildland fires."[14]

IV.2.7. Up River Evacuation

Evacuation from the Up River Planning Unit will travel south along Highway 169, connecting with Highway 96 to precede either northeast towards Orleans, or south towards Hoopa. If evacuation is blocked to the east and south, Bald Hills Road may also be used to travel west. Evacuation decisions will always depend on law enforcement recommendations based on *fire behavior*, wind pattern, traffic, and ingress of emergency vehicles.

There are numerous smaller roads connecting residences and neighborhoods to Highway 169, Highway 96, and Bald Hills Road. Adequate ingress and egress along these roads is vital to a large portion of the community that may need access to main *evacuation routes* and for firefighters who will be using the roads to access wildfires in these areas. Many of the smaller roads throughout the Reservation are in poor condition, which can challenge effective delivery of fire suppression resources.

To those without intimate knowledge of the area and a four-wheel drive vehicle, Highway 169 is a dead-end road. This is very problematic for a primary transportation route in such a far-removed location and creates the potential for dangerously long emergency *response times* and severely limited evacuation opportunities. Johnson Rd. and Hancorne Rd., in addition to Bald Hills Rd., could potentially provide emergency evacuation westward into Redwood National Park.

Evacuation impediments may include: landslides, fallen trees, downed power lines, overgrown vegetation, poorly marked streets and intersections, and *one-way-in, one-way-out roads* that could inhibit evacuation and emergency response vehicles, or leave residents stranded should the roads become blocked.

During wildfire events that have the potential to threaten personal safety, community evacuation sites may be established where residents can go to survive a wildfire. Evacuation sites will be established in different locations depending on the anticipated path of the wildfire. The determination for the location of these sites is normally made by Humboldt County Emergency Operations Center Incident Commander in cooperation with an *Incident Management Team*. The Humboldt County Sheriffs and Emergency Officials will use mass communication and door-to-door methods to inform residents about the threat and where residents should go to take shelter.

If a catastrophic event occurs, residents may not be able to reach designated evacuation sites. In such cases, residents may need to make decisions on their own about seeking shelter where they can survive the passage of the wildfire until they can reach an evacuation site. It can be very difficult to determine the right thing to do as the fire approaches. Before a wildfire threatens, community members should talk to their local fire department about evacuation procedures in their neighborhood.

[14] Yurok Tribe, Planning and Community Development. (2006, May 25). *Yurok Tribe Hazard Mitigation Plan.*

See section V.2.3 in Part V. Fire-Safe Communities for more information on preparing for safe evacuation and evacuation planning for pets and livestock. Also see section II.3.5 Evacuation Routes and Vulnerability in Part II. Risk Assessment for information about evacuation procedures and challenges in Humboldt County.

IV.2.8. Up River Community Identified Potential Projects

The following list and matrix includes community identified proposed projects based on input from the community processes discussed above. A detailed description of each heading in the matrix can be found in Appendix G: Descriptive Characteristics for Community Identified Projects Matrix. These projects are illustrated on the community-identified projects map found at the end of this Planning Unit Action Plan (Figure IV.2-3). Projects include those carried over from the 2006 fire-planning process and those identified and refined during the 2012 CWPP update process. This information can also be viewed on the fire planning GIS Portal. The GIS Portal allows users to search for and view specific fire planning features by location or to zoom into a desired area from an aerial view. To access the Portal, go to: http://gis.co.humboldt.ca.us/ and choose "Fire Planning" from the list of mapping applications. The data collected through this Planning process are included in the GIS layers within the Portal.

No vegetation *treatments* recommended in this plan will be carried out without the consent and involvement of the property owner and all applicable local, state and federal regulations must be observed.

Non-geographic community identified proposed projects based on community workshop notes:

- All roads should be evaluated for understory clearing needs.
- When clearing for wildfire hazard mitigation is done, burning or chipping the piles as soon as possible should be a priority so they do not become a hazard.
- Write a comprehensive burn plan that will assist efforts to start burning traditional, cultural burn areas again to improve ecological resource production.

LOCATION		Treatment/Project Information Eel Fire Planning Unit							
Number Corresponds with location on map	**Community, Structure, or Area (Value at Risk)**	**Description**	**Status**	**Year**	**Type**	**Acres**	**Veg Type**	**Maintenance (actual or proposed)**	**Funding source (actual or proposed)**
ORI039	Bald Hills Road	Stop burning at Redwood National Park at Bald Hills in Summer	Action Need		Other - Burning				Grant, landowner, Tribal funding, neighborhood or road association
ORL064	Weitchpec Rd/Hwy 169	Fuelbreak from Hwy 96 to Weitchpec Elementary School	Treat-Med	2010	Roadside Clearance	12.68			Grant, landowner, Tribal funding, neighborhood or road association
ORL065	Weitchpec	Upper Prairie Lake Rd.: Fuelbreak (as needed)	Treat-Med	2010	Roadside Clearance				Grant, landowner, Tribal funding, neighborhood or road association
ORL067	Cappell Rd & Rube Rd	Upper Cappell hazardous fuels reduction	Treat-Med	2010	Landscape	20.41			Grant, landowner, Tribal funding, neighborhood or road association
ORL071	McKinnon Hill Rd	McKinnon Hill Rd (slash removal)	Treat-Med	2010	Roadside Clearance				Grant, landowner, Tribal funding, neighborhood or road association
ORL075	Tully Creek Road	Tully Creek Subdivision	Treat-Med	2010	Defensible Space				Grant, landowner, Tribal funding, neighborhood or road association

Humboldt County Community Wildfire Protection Plan

LOCATION		Treatment/Project Information Eel Fire Planning Unit							
Number Corresponds with location on map	**Community, Structure, or Area (Value at Risk)**	**Description**	**Status**	**Year**	**Type**	**Acres**	**Veg Type**	**Maintenance (actual or proposed)**	**Funding source (actual or proposed)**
ORL089	Bluff Creek Resort - Hwy 96	Creek Resort Thinning and burning - Clear around existing structures and along Hwy 96	Treat-High		Landscape	24.63	Mixed Conifer-Hardwood	Every 3-10 years	Grant, landowner, Tribal funding, neighborhood or road association
ORL446	Understory Burning - Bald Hills Road	Understory burning on Bald Hills Rd. to support fire protection / bear grass resource production	Treat - Med	2012	Other - Burning				Grant, landowner, Tribal funding, neighborhood or road association
ORL447	Understory Burning - Po'to'yo Road (Iron Gate Rd)	Understory burning and hazardous fuels reduction to support fire protection.	Treat - Med	2012	Landscape and Other - Burning				Grant, landowner, Tribal funding, neighborhood or road association
ORL448	Fuel Reduction - Alameda Road	Alameda Road shaded fuel reduction, 50ft buffer.	Treat - Med	2012	Landscape				Grant, landowner, Tribal funding, neighborhood or road association
ORL449	Defensible Space - Weitchpec Tribal Center	Defensible space and fuel reduction around the Weitchepec Tribal Cener.	Treat - High	2012	Landscape and Defensible Space				Grant, landowner, Tribal funding, neighborhood or road association

LOCATION		Treatment/Project Information Eel Fire Planning Unit							
Number Corresponds with location on map	**Community, Structure, or Area (Value at Risk)**	**Description**	**Status**	**Year**	**Type**	**Acres**	**Veg Type**	**Maintenance (actual or proposed)**	**Funding source (actual or proposed)**
ORL450	Fuel Reduction - Old Village	Fuel reduction--fine fuels and grass-- for the Old Village Area; structure protection from arson ignition	Treat - Med	2012	Landscape and Defensible Space				Grant, landowner, Tribal funding, neighborhood or road association
ORL452	Shaded Fuelbreak - Head Start School	Head Start School shaded fuelbreak and water supply.	Treat - High	2012	Defensible Space and Other - Water				Grant, landowner, Tribal funding, neighborhood or road association
ORL453	Defensible Space - Wo-tekw Village Area	Defensible space and fuel reduction in and around the Wo-tekw Village area.	Treat - Med	2012	Defensible Space				Grant, landowner, Tribal funding, neighborhood or road association
ORL454	Defensible Space - Weitchpec School	Defensible space and fuel reduction in and around the area	Treat - High	2012	Defensible Space and Landscape				Grant, landowner, Tribal funding, neighborhood or road association
ORL457	Understory Burning - HWY 169 to Klamath River	Understory burning between highway 169, Klamath River for fire protection and hazel production	Treat - Med	2012	Landscape and Other - Burning				Grant, landowner, Tribal funding, neighborhood or road association

Humboldt County Community Wildfire Protection Plan

LOCATION		Treatment/Project Information Eel Fire Planning Unit							
Number Corresponds with location on map	**Community, Structure, or Area (Value at Risk)**	**Description**	**Status**	**Year**	**Type**	**Acres**	**Veg Type**	**Maintenance (actual or proposed)**	**Funding source (actual or proposed)**
ORL458	Fuel Reduction - New Village	Fuel reduction New Village Area include defensible space, access clearance	Treat - Med	2012	Defensible Space and Other - Access				Grant, landowner, Tribal funding, neighborhood or road association

IV.2.9. Up River Action Plan

The following items are the initial priorities for community action for the Up River Planning Unit as recommended by this Humboldt County CWPP (not listed in order of priority). In an ideal world, everything recommended here would be implemented. However, it must be understood that implementation will be subject to the availability of funds and other resources and the willingness/ability of community members and Plan Partners to take action. This Action Plan can be cited in grant applications to leverage needed implementation funds and used to guide and inspire action.

Enhancing Fire Protection

- **Sustainable Fire Departments:** Community members within this Planning Unit should support their local fire department through activities such as volunteering as firefighters or auxiliary members, making donations, supporting fundraisers, writing grants, and/or helping with administrative tasks. With community support, local fire departments can continue to provide a wide variety of vital emergency services.
- **Firefighting Water:** Increase the availability of water for fire protection by making water access locations known to fire departments and investing in more community water tanks. Neighborhood and road associations and/or *Firewise* Communities work with local fire departments to develop a *"Blue Dot" program*, which identifies the location of firefighting water sources by marking them with a blue reflective dot. This program also ensures that tanks and water systems are outfitted with fittings compatible with firefighting equipment. Begin by identifying where such a program is most needed. The following priority area was identified at the community meeting and is recommended for treatment in this plan:
    - Head Start School fire protection water supply.

Creating Fire Safe Communities

- **Firewise Communities:** Pursue participation in the Firewise Communities/USA recognition program with neighborhood groups in developed areas adjacent to the wildland, particularly where there are many residences located along dead-end roads. Actively implement and maintain the Firewise action plan on an annual schedule.

Reducing Wildfire Fuels (Flammable Vegetation)

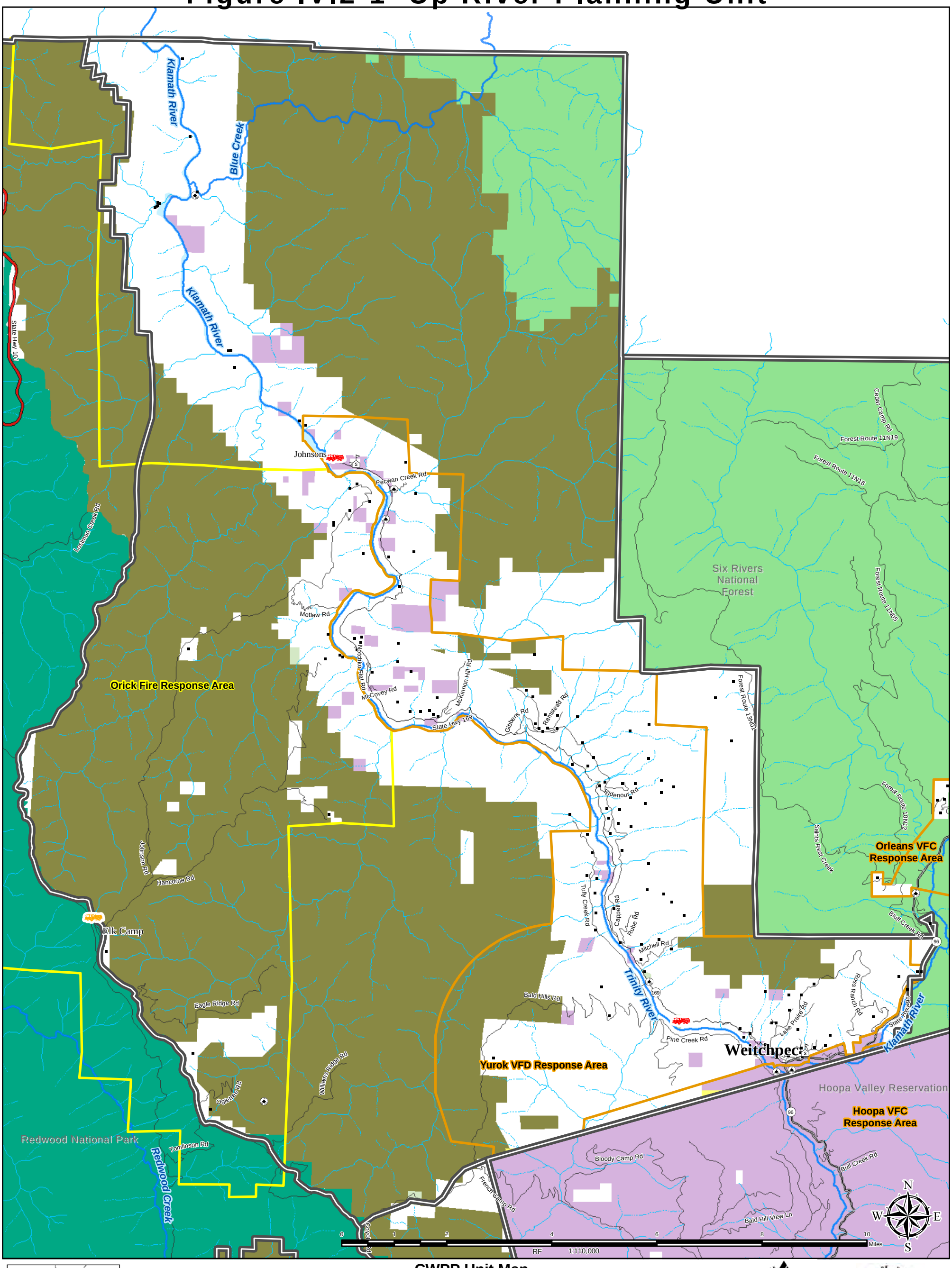
- **Defensible Space:** Those residents living in areas within this Planning Unit that are at risk to wildfire should manage the flammable vegetation within their home ignition zone. Maintaining *defensible space* through vegetation treatments should be a routine and ongoing practice for all homes and landscapes. Community *Chipper Days* can facilitate this process by helping landowners get rid of slash and brush piles so that they do not become an additional hazard. Begin by identifying where defensible space is most needed within the planning unit. The following priority areas were identified at community meetings and are recommended for treatment in this plan:
    - Subdivision on Tully Creek Road, west of Highway 169.
    - Landscape surrounding Head Start School.
    - Landscape around Weitchpec School.
    - Landscape surrounding Weitchpec Tribal Center.
    - Wo-tekw Village area.
    - New Village area, off of Highway 96.
- **Roadside Clearance:** Manage roadside vegetation in order to improve and maintain access for emergency vehicles and ensure safe evacuation. Consider working with the

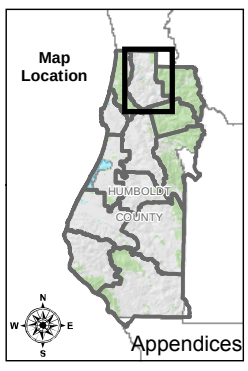
California Conservation Corps or County Public Works Roads Division. Focus initial efforts along the following roads:

- Weitchpec Road, between Highway 169 and Weitchpec School.
- Upper Prairie Lake Road.

- **Landscape Fuels Reduction:** Construct *shaded fuelbreaks* as buffers between residential areas and wildlands to slow the progress of wildfires. This allows firefighters a higher probability of successfully protecting communities from wildfire damage. These buffers may also protect the wildlands from the spread of fires originating within communities. The following areas are recommended for priority treatment in this plan:
  - Continue to work collaboratively with all interested partners to create and maintain a comprehensive burn plan for the purposes of community safety and preservation of cultural and ecological resources.
  - Hazardous fuels reduction (as needed) along upper Cappell Road and Rube Road.
  - Brush thinning along Highway 96 near Bluff Creek Resort.
  - Hazardous fuels reduction and understory burning along Po'to'yo Road (Iron Gate Road), off of Cappell Road.
  - A shaded fuelbreak along Alameda Road.
  - Reduce fine fuels and grass in Old Village Area.
  - Conduct understory burning between Highway 169 and the Klamath River.

Figure IV.2-1 Up River Planning Unit





CWPP Unit Map

Legend

- CWPP Planning Unit Boundary

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

Local Fire Organization Response Area
- District
- Out of District
- Non-Tax (Volunteer Fire Company (VFC))
- Proposed District Annexation Area (PDAA)

Improved Parcels
- Improved Parcel (not actual location of improvement)
- Commercial or Industrial Lot (not actual location)

Airports
- Landing Strip

Highways and Roads
- HWY 101
- State HWY
- HWY or Secondary Road
- Local Road or Street

Hydrography
- Major River or Stream

Infrastructure
- Gauging Station
- Water Tank or Source
- Historic Locations

Land Ownership

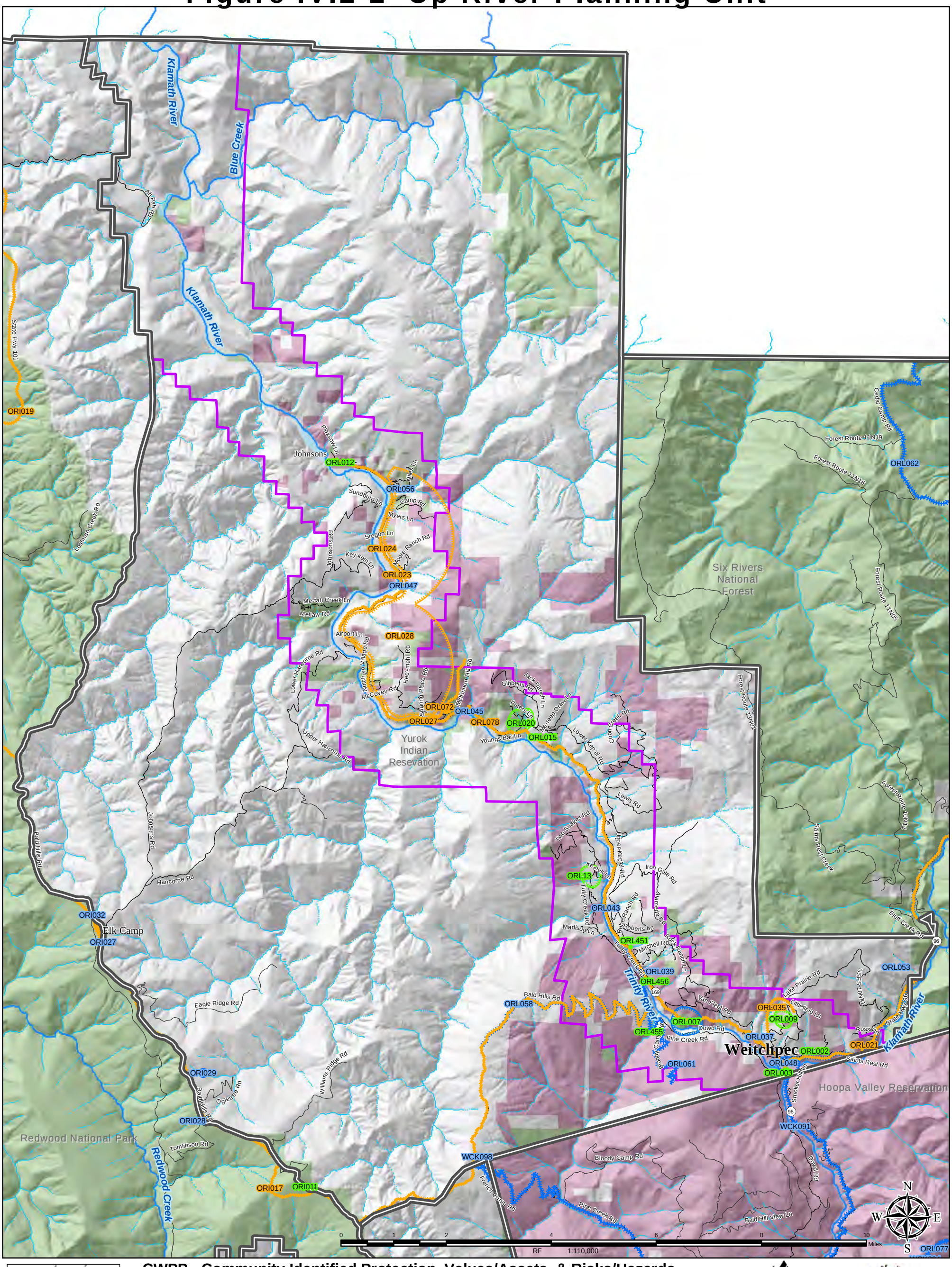
AGENCY
- Bureau of Land Management
- National Park Service
- State Park or Other State Lands
- Six Rivers National Forest
- U.S. Fish and Wildlife Service
- Tribal Lands
- Private
- Industrial Timber
- Cities

Land ownership and infrastructure data has been compiled by The County of Humboldt. Fire planning features identified at community workshops by residents; local, state, and federal fire service personnel; and Humboldt County staff. Other data sources were the 2006 Humboldt County Master Fire Protection Plan

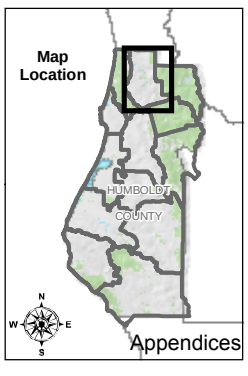
This map is intended for planning purposes and should not be used for precise measurement or navigation.

Map compiled by County of Humboldt, March 2013
Online maps visit: http://gis.co.humboldt.ca.us
Contact: cimmit@co.humboldt.ca.us or jvondohlen@co.humboldt.ca.us

Figure IV.2-2 Up River Planning Unit



Map Location



CWPP - Community Identified Protection, Values/Assets, & Risks/Hazards

Legend

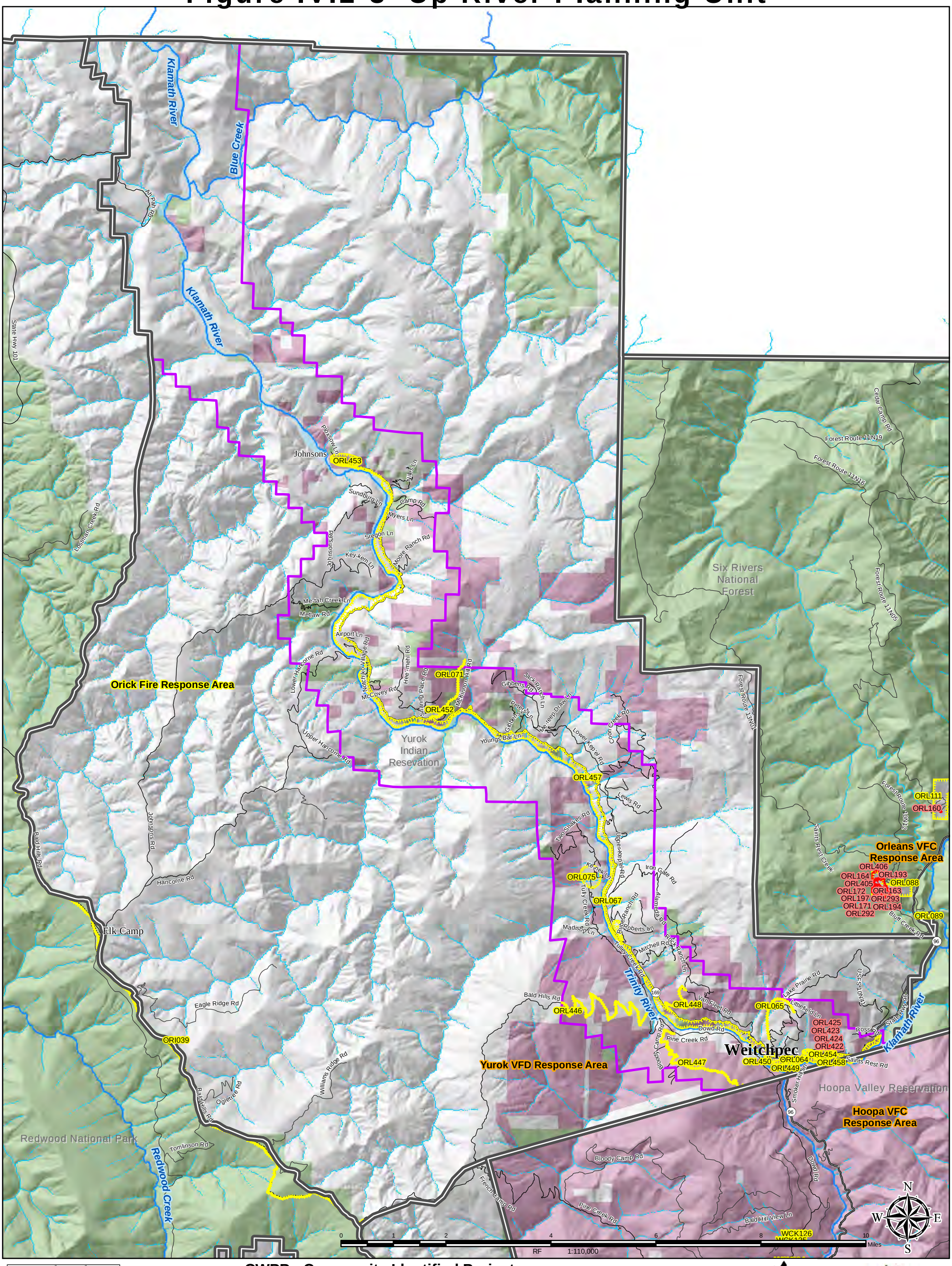
- CWPP Planning Unit Boundary
- **Community Identified Features**
  - Protection/Evacuation
  - Value/Asset
  - Risk/Hazard
- **Land Ownership**
  - Parks/Public Land
  - Reservation/Tribal Land
  - Cities
  - Reservation Boundary
- **Highways and Roads**
  - HWY 101
  - State HWY
  - HWY or Secondary Road
  - Local Road or Street
- **Hydrography**
  - Major River or Stream
  - Perennial Stream
  - Intermittent Stream

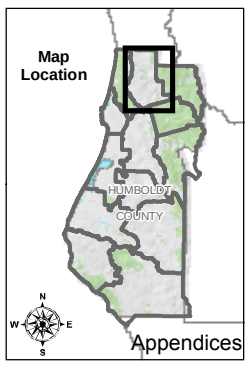
Land ownership and infrastructure data has been compiled by The County of Humboldt. Fire planning features identified at community workshops by residents; local, state, and federal fire service personnel; and Humboldt County staff. Other data sources were the 2006 Humboldt County Master Fire Protection Plan

This map is intended for planning purposes and should not be used for precise measurement or navigation.

Map compiled by County of Humboldt, March 2013,
Online maps visit: http://gis.co.humboldt.ca.us
Contact: cimmit@co.humboldt.ca.us or jvondohlen@co.humboldt.ca.us

Figure IV.2-3 Up River Planning Unit





CWPP - Community Identified Projects

Legend

- CWPP Planning Unit Boundary
- **Community Identified Projects**
  - Proposed Project
  - Treated Project
- **Land Ownership**
  - Parks/Public Land
  - Reservation/Tribal Land
  - Cities
  - Reservation Boundary
- **Highways and Roads**
  - HWY 101
  - State HWY
  - HWY or Secondary Road
  - Local Road or Street
- **Hydrography**
  - Major River or Stream
  - Perennial Stream
  - Intermittent Stream

Land ownership and infrastructure data has been compiled by The County of Humboldt. Fire planning features identified at community workshops by residents; local, state, and federal fire service personnel; and Humboldt County staff. Other data sources were the 2006 Humboldt County Master Fire Protection Plan

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IV.3. East Klamath Planning Unit Action Plan

IV.3.1. East Klamath Planning Unit Description

The East Klamath *Planning Unit* encompasses 135,466 acres situated in the northeast corner of Humboldt County with the Siskiyou County border to the northeast, the Del Norte County boundary to the north, and the communities of Weitchpec and Hoopa to the southwest. Highway 96 is the main transportation route through the Planning Unit and cuts diagonally across the area following along the Klamath River (the second largest river system in California). The Lower Klamath sub-*basin* dominates the geography of the area. The Unit encompasses that portion of the Lower Klamath sub-basin and its *tributary watersheds* from just downstream of the confluence of the Salmon River with the Klamath, near the Siskiyou-Humboldt County line, to the confluence of the Trinity River with the Klamath, near Weitchpec. Klamath River tributaries in this Unit include Red Cap, Bluff, Camp, Hopkins, Slate, Pearch, and Aikens Creeks.

The town of Orleans comprises the community population center of this Planning Unit. Orleans is included on the California Fire Alliance's list of *communities at risk* to damage from wildfire.[1] Several other small neighborhood groupings border the Highway 96 corridor with a few outlying in-holdings scattered throughout the surrounding National Forest. These neighborhoods are known as the communities of:

- Ten Eyck
- Donahue Flat
- Pearch Creek
- Owl Mine Road
- Lammon
- Bluff Creek
- Red Cap
- Upper Ishi Pishi
- Lower Ishi Pishi
- Thunder Mountain/Madrone Lane/Bark Shanty
- Camp Creek
- Cedar Camp
- Slate Creek

Not all residents in these communities have access to electricity or telephone service.

The Six Rivers National Forest predominantly manages the land in this unit. The majority of private-land ownerships are at low- to mid-elevations, clustered around Orleans and along Highway 96. A significant portion of the private land in this Planning Unit falls within the Karuk Ancestral Territory as defined by the Karuk Tribe. The 2010 Census reported 605 people in Orleans, with approximately 39% having Native American heritage, mainly of the Karuk Tribe.[2] A map of this planning unit can be viewed in Figure IV.3-1. East Klamath Unit: CWPP Unit Map.

Parcels in this Planning Unit range from less than one acre to more than 1,200 acres, with average parcel size between five and ten acres. Real estate values are moderate due to factors such as remoteness, driving values down, while the relatively small number of parcels for sale drives prices up. The general building type is wooden houses built before *wildland urban interface* (WUI) building standards (Chapter 7A of the California Building Code required since January 1, 2008) were in place. Recent development in the area has been primarily by the Karuk Tribal Housing Authority on tribal lands in the Orleans Valley.

[1] California Fire Alliance. (2012). *Communities at Risk List.* Retrieved from www.cafirealliance.org/communities_at_risk/communities_at_risk_list

[2] Firewise Communities/USA Recognition Program. (2011). *Orleans Community Assessment.*

IV.3.2. East Klamath Community Process Summary

The community process that informed the development of this Unit Action Plan was multifaceted. The Orleans/Somes Bar Fire Safe Council (OBS FSC) worked closely with the County of Humboldt to evaluate the 2006 list of wildfire mitigation projects for their area; adding much value to the 2009-2010 Humboldt County Hazardous Fuels Reduction Plan Update. Much effort also went into completing the local Orleans/Somes Bar Community Wildfire Protection Plan (CWPP). The OSB FSC, the Orleans Volunteer Fire Department (OVFD), County staff, and the California Department of Forestry and Fire Protection (CAL FIRE) worked together to design and facilitate a collaborative local CWPP review and input process among community partners and the public. This process involved multiple committee, neighborhood, and community-wide meetings and workshops. The end result of the multi-year process was: a finished local fire plan with all of the required signatures certifying it as a CWPP, a *Firewise* Community Assessment and Action Plan, and a list of concerns and action items born out of neighborhood wildfire safety and emergency response meetings.

A community workshop was hosted by the OSB FSC in coordination with OVFD on March 23, 2012 in the Panamnik Building for the purpose of gathering local information and garnering public input regarding various factors contributing to the extent of wildfire risk and/or preparedness among the communities in this Unit, and to provide information about the countywide CWPP process. The gathering was also held to celebrate the completion of the Orleans/Somes Bar CWPP and the recognition of Orleans as a national Firewise Community/USA site. A group exercise, which involved maps of the Planning Unit area, invited those present to help identify and pinpoint on the map where particular *fire hazards* exist, the location of *protection resources*, such as fire water drafting sites, as well as values and *assets at risk* within the community that could be threatened by wildfire. These workshop processes also provided an opportunity for participating community members to ask questions and provide information based on their local knowledge.

Participants were also asked to review pre-existing information illustrated on the maps which had been added by community members during similar workshops that took place during the initial planning process in 2006. This workshops and mapping exercise also facilitated discussion among community members about potential actions that could be taken to reduce fire risk in their community. Through discussion and collaborative processes, participants identified major hazard areas and compiled lists of project proposals for enhancing their community's fire preparedness.

The community-identified fire hazards, protection resources, and values and assets at risk discussed throughout the following sections of this Planning Unit Action Plan reflect information generated by these community workshop mapping exercises, as well as information resulting from direct outreach to local fire departments and residents.

The project proposals resulting from community member discussions are contained in section IV.3.8. Community-Identified Projects in this Planning Unit Action Plan.

IV.3.3. East Klamath Wildfire Environment

Nearly the entire East Klamath Planning Unit (99%) is zoned "Very High *Fire Hazard Severity*," as determined by CAL FIRE.[3] The unit is composed of rugged, mountainous terrain with elevations ranging from around 400 feet along the Klamath River corridor to over 6,000 feet at Orleans Mountain. Steep slopes, which can increase fire spread, dominate the forestlands, with much of the area in the 60% or greater slope class.

[3] CAL FIRE (California Department of Forestry and Fire Protection). (2007). *Fire Resources Assessment Program (FRAP).* [Map showing Fire Hazard Severity Zone ratings within various geographic areas, mapped by county]. Fire Hazard Severity Zones Map. Retrieved from http://frap.cdf.ca.gov/

This Unit is characterized by warm, dry summers and cool, wet winters. Local vegetation includes a variety of mixed evergreen forests, including Douglas-fir (particularly in the eastern forests), tanoak, madrone, and black oak. Exposed, rocky sites can contain continuous stands of canyon live oak, and brush fields composed of wedge leaf ceanothus, incense cedar, and Jeffery Pine. Willows, black cottonwood, big leaf maple and red alder fill the floodplains of larger waterways, while riparian areas without a defined floodplain more closely resemble the surrounding forest type, with a greater proportion of maples and alders.[4]

Traditionally, Karuk tribal management systems have incorporated low-intensity intentional burns, in part to help manage the availability of acorns and basketry materials, many of which are fire-dependent.[5] However, a history of *fire suppression* since the early 1900's has dramatically altered the *landscape* and fostered the accumulation of dense, flammable vegetation in the forest understory, which acts as *fuel* and increases the risk of high-intensity wildfires. Forest ecosystems, accustomed to low-intensity fires that would burn off brush and newer starts in the *understory*, become threatened by overcrowded forests and accumulated fuel. This ecosystem dynamic is creating risk for *wildfires* of greater intensities and on a larger scale than the local vegetation is adapted to withstand. The introduction of *invasive and exotic species*, which can alter the structure of native plant communities, may exacerbate this fuel problem.[6] The extent that the landscape has been altered as a result of fire suppression is reflected in the *condition class* of the Unit area. Condition class describes the degree of departure from the historical *natural fire regime*. Where the condition class indicates that fire has been absent for an unnaturally long time, the hazard and potential damages are high to both the environment and human developments in the area. Approximately 48% of the East Klamath Planning Unit is condition class 3, meaning the fire regime is significantly altered from the historical range; and approximately 41% of the area is condition class 2, or moderately altered from the historical range.

In the past decade there has been frequent wildfire activity within and adjacent to the Unit. The names, year, and acreage covered by the most recent major fire events within this Unit are as follows:[7]

- Backbone Fire, 2009: 6,712 acres.
- Siskiyou/Blue 2 Fire, 2008: 99,797 acres.
- Panther Fire, 2008: 53,149 acres.
- The Ukonom Fire, 2008: 80,147 acres.
- The Anthony Milne Fire, 2008: 1,778 acres.
- Elk Complex Fire, 2006: 73 acres.
- Somes Fire, 2006: 15,624 acres.
- Uncles Fire, 2006: 3,760 acres.
- Titus Fire, 2006: 6,272 acres.
- Hancock Fire, 2006: 22,170 acres.

Humans and lightning strikes are the main wildfire *ignition sources* here. While lightning-caused ignitions are fewer and scattered sporadically throughout the unit, human-caused ignitions

[4]Firewise Communities/USA Recognition Program. (2011). *Orleans Community Assessment.* (p.4.)
[5] Orleans/Somes Bar Fire Safe Council. (2007, September). *Orleans/Somes Bar Community Wildfire Protection Plan.* (p.6.) Retrieved from http://www.mkwc.org/publications/fireandfuels/firesafecouncil/CWPP_OSB_9_21_07_NoPictures.pdf.
[6] Orleans/Somes Bar Fire Safe Council. (2007, September). *Orleans/Somes Bar Community Wildfire Protection Plan.* (p.12.)
[7] For a more detailed list, including fire severity, please refer to page 11 of the *2012 Orleans/Somes Bar Community Wildfire Protection Plan.*

are more densely centralized near Orleans and along creeks, rivers, and roads.[8] Vehicles can also be ignition sources where accumulated *fuel loads* exist on the side of the road.

Dead plant matter and vegetation with low *moisture levels* within 100-150 feet of homesteads pose some of the greatest threats to *structural ignitability*. Of particular concern are houses with needles and leaves accumulating on rooftops or in rain gutters. Houses with wooden rooftops and sidings add to this risk, as do the presence of wooden decks, particularly those with dead plant matter accumulated underneath. Vegetation around structures vary; some residences on high river bars may support farms and gardens, while other parcels may be largely forested or contain pastures in small-to-medium openings in the forest.[9] Although private properties tend to be located on more gentle terrain, some homes are surrounded by steep slopes that can limit their defensible areas and put structures in the line of up-hill spreading wildfires. Figure IV.3-2 found at the end of this Unit Action Plan illustrates risks and hazards identified by community members at public workshops and can be used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt County Web GIS Portal, "Fire Planning" section: http://gis.co.humboldt.ca.us/.

Highway 96 is the central *ingress and egress* route, with numerous smaller roads connecting residences and neighborhoods to it. Poor, or complete lack of *signage* at roads and intersections pose potential problems for emergency ingress and egress; this is especially true for more remote residences that are further away from the town. The narrowness of smaller roads leading to these remote residences could create serious complications for emergency vehicle responses trying to gain access during simultaneous home evacuations. Routes may also be overgrown with vegetation, and many properties have inadequate vehicle *turn-around spaces*.[10] The potential for landslides in the area could also inhibit access.

According to the Orleans/Somes Bar CWPP, the risk of fuel hazard and wildland fire occurrence is "low" around many of the important community structures, such as the Karuk Medical Clinic and Department of Natural Resources, the Orleans Elementary School, and the Panamnik Building. However, the vast majority of neighborhoods and residences within the Unit are designated "medium" and "high" risk for fuel hazard and wildland fire occurrence.[11]

The Orleans Community Service District provides potable water to a population of approximately 300 and services 1.59 square miles. Their critical infrastructure and equipment includes: approximately 100 miles of water mains, a water treatment facility, and three filters; one 100,000 gallon redwood tank, and one pump station with one 5-hp pump; and two computerized pumps, as well as 33 fire hydrants.[12] Residents outside the Service District obtain water through other means, such as drawing from nearby creeks and holding tanks. *Fire protection water* may also be *drafted* from the following locations:

- Big Bar
- Orleans Bar
- Red Cap Bar
- Ullathorne

The map in Figure IV.3-2 found at the end of this Planning Unit Action Plan illustrates these *drafting sites* as well as other community-identified wildfire *protection resources*. The map can

[8] Orleans/Somes Bar Fire Safe Council. (2007, September). Figure 3.2: Fire starts by cause and ignition density. *Orleans/Somes Bar Community Wildfire Protection Plan.*

[9] Firewise Communities/USA Recognition Program. (2011). *Orleans Community Assessment.* (p.5.)

[10] Firewise Communities/USA Recognition Program. (2011). *Orleans Community Assessment.* (p.8.)

[11] Orleans/Somes Bar Fire Safe Council. (2007, September). Table 4.1: Risk assessment for structures at risk. *Orleans/Somes Bar Community Wildfire Protection Plan*.

[12] County of Humboldt, Natural Resources Planning. (2008). *Humboldt Operational Area Hazard Mitigation Plan; Volume 2 – Planning Partner Annexes.* (p. 11-1.) Retrieved from http://www.co.humboldt.ca.us/natural-resources/hazardmitigation/?inc=finaldraft

be used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt County Web GIS Portal, "Fire Planning" section: http://gis.co.humboldt.ca.us/.

Because of the severe level of wildfire risk and past experiences with wildfire, residents in this Planning Unit have an acute understanding of the need to take fire *hazard mitigation* action. This high level of awareness coupled with the fire safety education efforts of the OSB FSC and the OVFD have led to many residents taking steps to reduce their vulnerability to damage from wildfire. Wildfire mitigation steps include managing hazardous vegetation around homes through *manual and mechanical fuel reduction*, *prescribed burning*, improving signage, development of water sources to increase firefighting capacity, *fuels treatment* along critical *access routes*, and extensive pre-fire planning efforts in conjunction with the Six Rivers National Forest – Orleans Ranger District. However, there remains work to be done; wildfire mitigation recommendations are made below in the unit action plan.

IV.3.4. East Klamath Values and Assets at Risk

Assets at risk can be defined as those things that are important to quality of life that can be threatened with destruction or loss from wildfire. These may include community assets such as homes and businesses, as well as environmental values such as wildlife habitat, natural resources, and air quality, along with any other important attribute that individual communities rely on for their well being. Loss or damage to community assets as a result of wildfire can have short- or long-term impacts of varying severity, depending on the asset. Short-term loss caused by a *wildfire* can include the destruction of residences, commercial assets, timber, wildlife habitat, scenic vistas, and *watersheds*. Long-term effects may include displaced persons, smaller timber harvests, reduced access to affected recreational areas, and destruction of cultural, ecological, and economic resources, and community infrastructure.

The majority of *assets at risk* in this community are residential homes, as well as community, tribal, and United States Forest Service (USFS) facilities, and farmlands. The Panamnik Elder Building, where the Mid Klamath Watershed Council meets, is another noteworthy asset at risk. River recreation is popular during the summer months and river access locations are also values at risk. Fewer than a dozen small campgrounds border rivers and creeks in the area, and the Forest Service maintains public river access spots as well. Additionally, Sandy Bar Ranch, just north of Orleans, supports several small visitor cabins along the Salmon River. Other assets in this unit include communications and utility infrastructure.

The map in Figure IV.3-2 found at the end of this Unit Action Plan illustrates values and assets at risk to wildfire identified by community members at public workshops. The map can be used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt County Web GIS[13] Portal, "Fire Planning" section: http://gis.co.humboldt.ca.us/. Some of the community-identified assets at risk within this Unit include:

- Karuk Community Center
- Thunder Mountain/Madrone Neighborhood Water Supply
- Crawford Creek Watershed
- Perch Creek Area

IV.3.5. East Klamath Community Preparedness

Orleans has a rich recent history of community preparedness. The community has been informed and abetted by the OSB FSC since 2001, now also known as the Orleans Firewise Board.

> "The mission of the OBS FSC is to help plan, implement, and monitor the reinstatement of historic fire regimes primarily through strategic fuel reduction in

[13] Geographic Information Systems (GIS).

> a manner that protects life, property, improves forest health, and enhances the resources valued by its stakeholders."[14]

The OSB FSC has been awarded nearly $1 million in grant funding to support projects such as constructing *shaded fuelbreaks*, prescribed burning programs, community volunteer brushing and burning workdays, and a community mow and *chip program.* [15]

To date, the OSB FSC has facilitated the construction of over 1,400 acres of shaded fuelbreaks, burned nearly 400 acres of private lands, and mowed approximately 60 acres annually as part of its "mow and chip" program. As part of the OSB FSC's ongoing community fire awareness campaign, they have created a model *Fire Safe* Demonstration Garden at the Karuk Tribe's Native Plant Demonstration Garden behind the Orleans Medical Clinic. The OSB FSC has also produced two videos ("Sparking a Change: Burning for a Fire-Safe Community and Forest," which documents their prescribed burning program, and "Lifestyles of the Rural and Fire Safe," which highlights local residents who utilize diverse methods to protect their homes from wildfires), and is currently working on a larger video project documenting the movement to increase the use of prescribed fire as a land management tool for improving the *resiliency* of communities and ecosystems to wildfire.

Additionally, the OSB FSC has collaborated with the County of Humboldt to implement the *Fire-adapted Landscapes and Safe Homes (FLASH) program*. FLASH is a rebate program that reimburses property owners for *hazardous vegetation management* completed around their homes, along access routes, and in particularly hazardous areas. Between 2010 and 2011, over 46 acres were treated under the FLASH program and 26 site visits including a home risk assessment were conducted by FSC staff. The program has received additional funding for 2012-2013 and the goal is to treat 25 more acres.

The OSB FSC, in collaboration with the OVFD, the County of Humboldt, and CAL FIRE, achieved national Firewise recognition for the community of Orleans in November 2011. The National Fire Protection Association's (NFPA) Firewise Communities program teaches people how to adapt to living with wildfire and encourages neighbors to work together and take action to wildfire prevent losses. The program provides many tools and resources to communities. The Orleans Firewise Community Assessment and Action Plan provide residents with information and guidance for taking action on an individual and community-wide level to address wildfire hazards.

The OBS FSC also coordinated the creation of the Orleans-Somes Bar CWPP, which was completed in January 2012. Collaborators included: Orleans VFD, USFS, Karuk Tribe, CAL FIRE, Salmon River FSC, the Humboldt County FSC, and the FSC of Siskiyou County. The Plan's primary goals are "to protect life, property, and resources in and around the Orleans/Somes Bar community, especially in regards to protection from wildland fire."[16] The Plan is also intended to enhance collaboration between local, state, tribal, and federal wildland fire protection agencies as well as community members, and to provide communities, agencies and the Karuk Tribe with information that can be used to guide the planning and implementation of community fire-safety projects.

The OBS FSC can be reached by calling Dale or Giselle Nova (joint coordinators) at (530)-926-2089, by e-mail at: nova@firesafesiskiyou.org, or by visiting their website at: http://firesafesiskiyou.org/OrleansSomesBar/HomePage.

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[14] Orleans/Somes Bar Fire Safe Council. (2007, September). *Orleans/Somes Bar Community Wildfire Protection Plan.* (p.3.)

[15] Firewise Communities/USA Recognition Program. (2011). *Orleans Community Assessment.* (p. 6.)

[16] Orleans/Somes Bar Fire Safe Council. (2007, September). *Orleans/Somes Bar Community Wildfire Protection Plan.* (p. 3.)

IV.3.6. East Klamath Fire Protection Level of Service

Community fire protection within the Unit is provided by the OVFD, which serves 30 square miles, and provides *mutual aid* on another 30 square miles. The OVFD is comprised of 12 volunteer firefighters with 6 support volunteers. Their *apparatuses* include: one type-1 engine, one type-3 engine, a rescue rig, and a 3,500 gallon *water tender*. This group also provides *Advance Life Support/Basic Life Support* (ALS/BLS) medical support to the Lower Middle Klamath River community. The OVFD can be reached by calling (530) 627-3344.

The USFS is responsible for wildland fire protection. A cooperative agreement enables the USFS to respond to fires on private properties, with consent from landowners, tribal representatives, and the OVFD. Additionally the USFS Orleans Ranger District may provide firefighting resources if the OVFD is in need of aid; reciprocally, the OVFD may respond to requests for additional support from the USFS. These two agencies also share the responsibility of responding to threats of fire spreading as a result of vehicular accidents.

Many communities in this Unit have various needs associated with improving the availability of emergency water for wildfire protection. There are some locations where firefighting water is not available or where emergency water storage is needed to supplement the potentially over-taxed municipal water supply. Many existing water sources are in need of maintenance, protection, or improvements. There is also a need to make the location of existing water sources more apparent to firefighters, and for community members to ensure that their water sources are properly outfitted for firefighting equipment.

IV.3.7. East Klamath Evacuation

Evacuation from the East Klamath Planning Unit will travel either south-west or north-east along Highway 96, depending on law enforcement recommendations based on *fire behavior*, wind pattern, traffic, and ingress of emergency vehicles. There are numerous smaller roads connecting residences and neighborhoods to Highway 96. Adequate ingress and egress along these roads is vital to a large portion of the community that may need access to the main highway *evacuation route* and for firefighters who will be using the roads to access wildfires burning in up-slope areas. Because of their importance, some of these roads have been given an overall community priority rating as emergency access routes in the Orleans/Somes Bar CWPP.

Overall priority for emergency access routes was identified by using a simple point scale corresponding to overall risk and community value rankings. Community value was determined by “the number of people served by the route and the route’s strategic placement for fire protection for the entire community.”[17] The majority of the emergency access routes were assessed as having "high" or "medium" overall risk based on fuel hazard, risk of wildland fire occurrence, and level of firefighting capability. The following roads rated "high" in overall priority as emergency access routes in the Orleans/Somes Bar CWPP and should be the first to receive wildfire hazard mitigation treatments:[18]

[17] Orleans/Somes Bar Community Wildfire Protection Plan, January 2012, p.30

[18] Orleans/Somes Bar Fire Safe Council. (2007, September). Table 5.3: Priority for other areas of community importance. *Orleans/Somes Bar Community Wildfire Protection Plan.*

- Eyeese Road
- Lower and Upper Nantucket Roads
- Ishi Pishi Road
- Ten Eyck Mine Road
- Bark Shanty Road
- Madrone Lane Thunder Mountain Road
- East and West Pearch Creek Roads
- Orleans School Road
- Ferris Ranch Road
- Red Cap Road
- Gold Dredge Road
- Big Rock Road
- Camp Creek Road
- Lower Camp Creek Road.

Evacuation impediments may include: landslides, fallen trees, overgrown vegetation, poorly marked streets and intersections, and *one-way-in, one-way-out roads* that could inhibit evacuation and emergency response vehicles, or leave residents stranded should the roads become blocked.

During wildfire events that have the potential to threaten personal safety, community evacuation sites may be established where residents can go to survive a wildfire. Evacuation sites will be established in different locations depending on the anticipated path of the wildfire. The determination for the location of these sites is normally made by Humboldt County Emergency Operations Center Incident Commander in cooperation with an *Incident Management Team*. The Humboldt County Sheriffs and Emergency Officials will use mass communication and door-to-door methods to inform residents about the threat and where residents should go to take shelter.

If a catastrophic event occurs, residents may not be able to reach designated evacuation sites. In such cases, residents may need to make decisions on their own about seeking shelter where they can survive the passage of the wildfire until they can reach an evacuation site. It can be very difficult to determine the right thing to do as the fire approaches. Before a wildfire threatens, community members should talk to their local fire department about evacuation procedures in their neighborhood.

See section V.2.3 in Part V. Fire-Safe Communities for more information on preparing for safe evacuation and evacuation planning for pets and livestock. Also see section II.3.5 Evacuation Routes and Vulnerability in Part II. Risk Assessment for information about evacuation procedures and challenges in Humboldt County.

IV.3.8. East Klamath Community Identified Potential Projects

The following section includes a summary of potential projects identified through the community processes discussed above. Some of the potential projects are illustrated on the community-identified projects map found at the end of this Unit Action Plan (Figure IV.3-3). This map includes projects carried over from the 2006 fire-planning process and those identified and refined during the OSB local CWPP and the 2012 County CWPP update process. In addition, Figure IV.3-2 illustrates community-identified Values and Assets, Hazards and Risks, and Wildfire Protection Resources. The maps in Figure IV.3-2 and Figure IV.3-3 can each be used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt County Web GIS Portal, “Fire Planning” section: http://gis.co.humboldt.ca.us/.

Because of the tremendous amount of work that has been accomplished within this unit and the continued refinement of priorities that is underway, a project matrix was not included in this Unit Action Plan. All of the community identified project information is cataloged in the Web GIS Portal described above and this CWPP incorporates that information by reference here. This information will continue to be made available as a resource for capturing grant funds and continued project implementation tracking.

Project ideas are also listed that are not visible on the maps, because they are not geographically based. These proposed actions also add to and expand upon the 2006 plan, based on the 2012 process (including the County CWPP update, the completion of the local CWPP, and

the Firewise action plan). Because of the complexity of the planning process in this unit, the proposed projects are broken out into the following three categories:

- CWPP Action Items,
- Neighborhood Meeting Action Items, and
- Firewise Action Items

CWPP Action Items

The Orleans/Somes Bar CWPP lists and outlines various types of projects that have been proposed to improve fire safety in the area in a five to ten year action plan. These projects fall under the categories of:

- Education
- Planning and Coordination
- Fuels Reduction
- Policy Modification;
- Infrastructure
- Fire protection
- Utilization, and
- Research and Monitoring.

The Orleans Somes Bar CWPP also includes a compilation of community-identified proposed projects, which was generated through evaluation of projects from the 2006 Humboldt County Master Fire Protection Plan and 2009-2010 Humboldt County Hazardous Fuels Reduction Plan Update. These projects were reviewed and refined in 2012 by local FSC representatives, Humboldt County staff, and fire agency personnel. Mapped projects are shown on the map in Figure IV.3-3 and the project codes correlate with a description that can be found in the Humboldt County Web GIS Portal (http://gis.co.humboldt.ca.us/).

The following summarizes the projects proposed in the Orleans/Somes Bar CWPP. A complete copy of the Orleans/Somes Bar CWPP, which includes the table of coded projects mentioned above, can be found on the Mid-Klamath Watershed Council and Humboldt County FSC websites.

- Proposed **Education** projects include workshops and trainings designed to provide community members with skills and information related to fire safety for the home, prescribed fire uses, and fire protection. Conferences designed to foster mutual understandings of management and research needs among scientists, agencies, and local residents are also proposed.
- Projects proposed to improve **Planning and Coordination** include: meetings to address community fire safety and preparedness; collaborative strategizing to produce community-accessible plans and maps; and community surveys to inform fire prevention efforts.
- Proposed **Fuels Reduction** projects aim to reduce fire risk by creating and maintaining defensible spaces, emergency access routes, ¼ mile buffers in between WUI and residential areas, and prioritized control features, such as firelines, ridge trails, and rivers and creeks.
- Proposed projects related to **Policy** include pushing for community collaboration with regulatory agencies, federal government, the Karuk Tribe, and insurance companies, to promote more inclusive fire management and safety options.
- Proposed **Biomass Utilization** projects are aimed at facilitating the sustainable development and marketing of alternative forest products and small-diameter wood products, which are byproducts of the fuel reduction industry, as well as developing plans for biomass utilization.

- **Fire Protection** projects include keeping the Orleans/Somes Bar Emergency Response Book up to date, and facilitating resident awareness of evacuation options.
- Proposed **Infrastructure** projects include: maintaining emergency access routes, updating community and emergency communication systems, ensuring the availability of adequate water for fire-suppression efforts, and supporting the local fire and rescue organization.
- Projects related to **Research and Monitoring** focus on improving coordination among all stakeholders in the implementation of CWPP objectives, as well as in research efforts to better understand the effects of fire in forest ecosystems. Proposed research efforts include: understanding the effects fuel reduction activities have on various vegetation types and non-timber forest products; understanding the relationship of upslope management on in-stream flows; and examining the flammability of fuel properties.
- Community-identified projects include: creating and maintaining **defensible space** in residential areas; conducting **roadside clearance** projects along transportation corridors and emergency access routes; and maintaining the **landscape** with fuel hazard reduction efforts in priority areas.

Neighborhood Meetings

The OVFD and OSB FSC compiled results from neighborhood wildfire safety and emergency response meetings conducted during the months of January and February in the neighborhoods of Camp Creek, Red Cap, Slate Bluff Lammon, Orleans, Perch Creek, Ti Bar/Patterson, and Somes Bar/Offield/Butler. At these meetings, community members discussed and identified needs and potential projects needed to reduce fire hazard and risk and to improve community preparedness in their neighborhoods. The following provides a summary of the projects proposed at these meetings; the full text of notes from these meetings can be found at http://www.mkwc.org/publications/index.html.

- Implement **hazardous fuel reduction** projects throughout the region: along roadsides, in neighborhoods with areas of brush accumulation, within residential defensible spaces, near campgrounds, near water systems, and in between neighborhoods and National Forest areas. Devise alternate methods of completing these projects, as grant funding becomes scarcer.
- Improve community **communication networks** and increase collaborative planning for disaster preparedness.
- Conduct maintenance on existing **water sources**, broaden community awareness about water usage and source locations, work on developing additional water sources, and encourage residents to adapt their water sources to the needs of fire protection equipment. Search for grant funding to aid these efforts.
- Work on ways of improving **ingress and egress**, such as opening access to emergency response vehicles on connective private roads, and creating fire engine turn-around spaces.
- Increase community awareness and access to information about **controlled burns** as well as proper and safe **pile-burning** methods and fuel reduction strategies.
- Augment **collaboration** between fire protection and forestry organizations as well as community members to develop more cohesive wildland fire-management strategies.
- Assess and evaluate the effectiveness of strategies within the **Burned Area Emergency Response** (BAER) program.

Firewise Action Plan

The Firewise Action Plan, which resulted from the community Firewise assessment, contains a list of short-term actions with measurable objectives that can be done within the home ignition zone, within high risk community areas, and the community at large. These actions are consistent

with implementation of the Orleans/Somes Bar CWPP. The following summarize the projects proposed in the Firewise Action Plan:

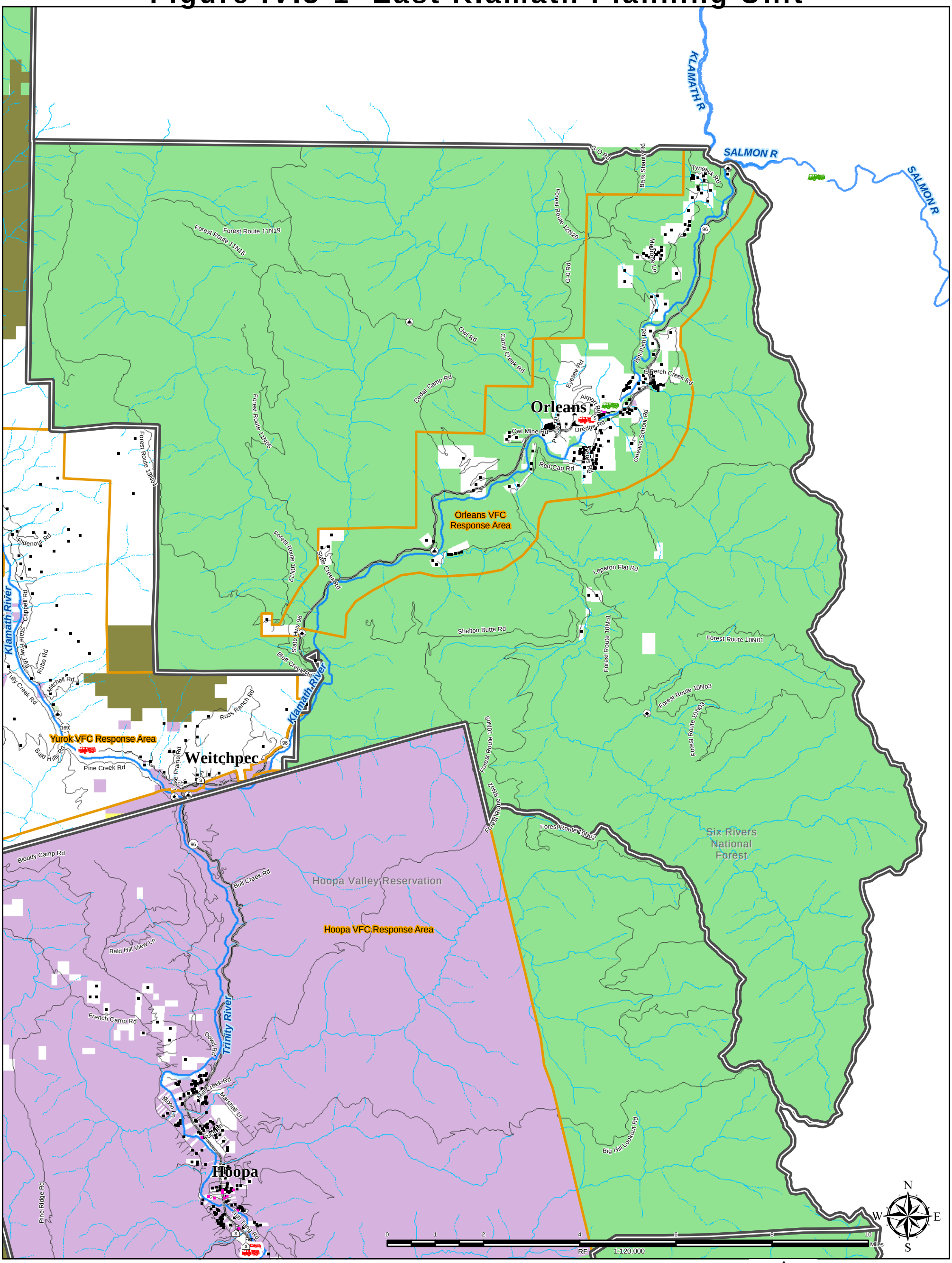
- **Post road or driveway signs** on at least ten currently unmarked locations.
- Mechanical **fuel reduction** on 50 acres of private property, and controlled burning for fuels reduction on 10 acres of private property.
- Complete wildfire hazard reduction with **FLASH** funding for five property owners.
- Host an **annual Firewise event**.
- Construct a **Fire Information Sign** and Firewise Certification display.
- Encourage **Blue Dot Program** (firefighting water source identification program) participation from five landowners.
- Update the **Emergency Response booklet**.
- Host two additional **outreach events** where Firewise materials will be available.

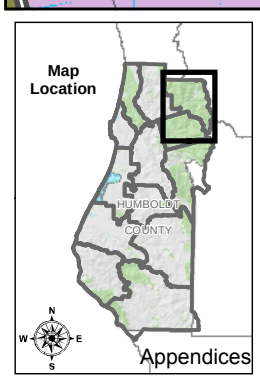
IV.3.9. East Klamath Action Plan

The following items are the initial priorities for community action for the East Klamath Planning Unit as recommended by this Humboldt County CWPP (not listed in order of priority). In an ideal world, everything recommended here would be implemented. However, it must be understood that implementation will be subject to the availability of funds and other resources and the willingness/ability of community members and Plan Partners to take action. This Action Plan can be cited in grant applications to leverage needed implementation funds and used to guide and inspire action.

- Maintain and support the OSB FSC to facilitate community wildfire preparedness and mitigation.
- Ensure that the OSB FSC continues to be represented on the Humboldt County FSC.
- Maintain and support the OVFD to provide community emergency services.
- OSB FSC and OVFD work with community members to further refine and integrate the lists of potential projects identified through the various fire planning processes discussed above and collaborate to prioritize and implement them (See the list included in the section above as well as projects illustrated on the Web GIS Portal).
- Apply to renew participation in the Firewise Communities/USA recognition program annually. This will include an annual update of the Firewise action plan, which can be used as a short-term OSB CWPP implementation tool. Actively implementing and maintaining the Firewise action plan on an annual basis will take small bites out of the OSB CWPP which has a five to ten year planning horizon.
- Share GIS data sets between local representatives and County staff to maintain the projects included in the County Web GIS Portal.
- OSB FSC and OVFD work with the Humboldt County Office of Emergency to engage community members in evacuation preparedness. Efforts should be made to ensure that local gates are open or accessible during Red Flag conditions.

Figure IV.3-1 East Klamath Planning Unit





CWPP Unit Map

Legend

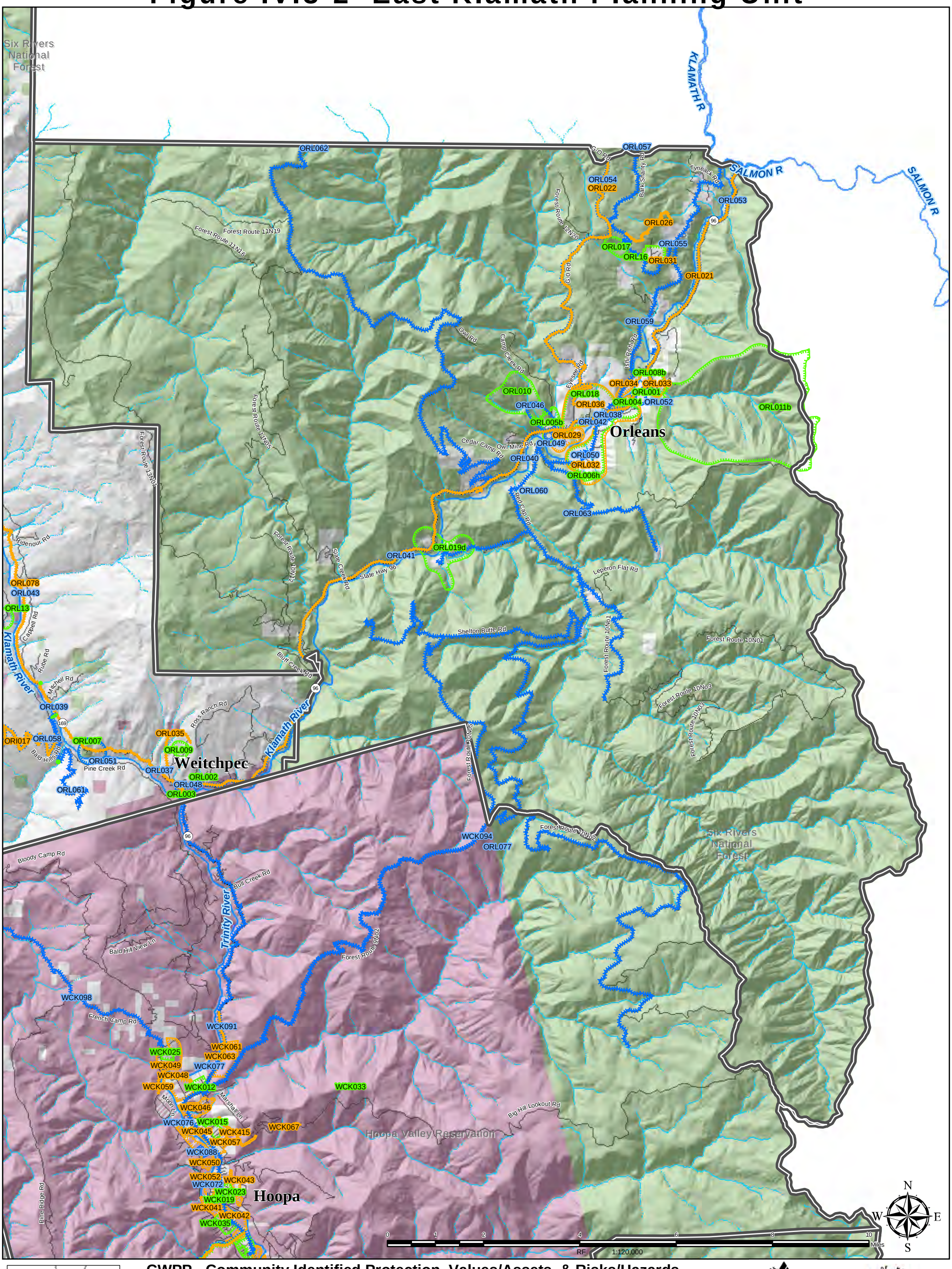
- CWPP Planning Unit Boundary
- **Emergency Response**
  - Local Fire Station
  - CAL Fire Station
  - Six Rivers Fire Station
- Hospitals and Clinics
  - Hospital/Medical Center
  - Red Cross
- **Lookout, Lights, Radio**
  - Lighthouse
  - School
- **Local Fire Organization Response Area**
  - District
  - Out of District
  - Non-Tax (Volunteer Fire Company (VFC))
  - Proposed District Annexation Area (PDAA)
- **Improved Parcels**
  - Improved Parcel (not actual location of improvement)
  - Commercial or Industrial Lot (not actual location)
- **Airports**
  - Landing Strip
- **Highways and Roads**
  - HWY 101
  - State HWY
  - HWY or Secondary Road
  - Local Road or Street
- **Hydrography**
  - Major River or Stream
- **Infrastructure**
  - Gauging Station
  - Water Tank or Source
  - Historic Locations
- **Land Ownership**
  - AGENCY
  - Bureau of Land Management
  - National Park Service
  - State Park or Other State Lands
  - Six Rivers National Forest
  - U.S. Fish and Wildlife Service
  - Tribal Lands
  - Private
  - Industrial Timber
  - Cities

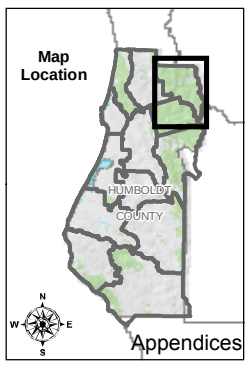
Land ownership and infrastructure data has been compiled by The County of Humboldt. Fire planning features identified at community workshops by residents; local, state, and federal fire service personnel; and Humboldt County staff. Other data sources were the 2006 Humboldt County Master Fire Protection Plan

This map is intended for planning purposes and should not be used for precise measurement or navigation.

Map compiled by County of Humboldt, March 2013
Online maps visit: http://gis.co.humboldt.ca.us
Contact: cimmit@co.humboldt.ca.us or jvondohlen@co.humboldt.ca.us

Figure IV.3-2 East Klamath Planning Unit





CWPP - Community Identified Protection, Values/Assets, & Risks/Hazards

Legend

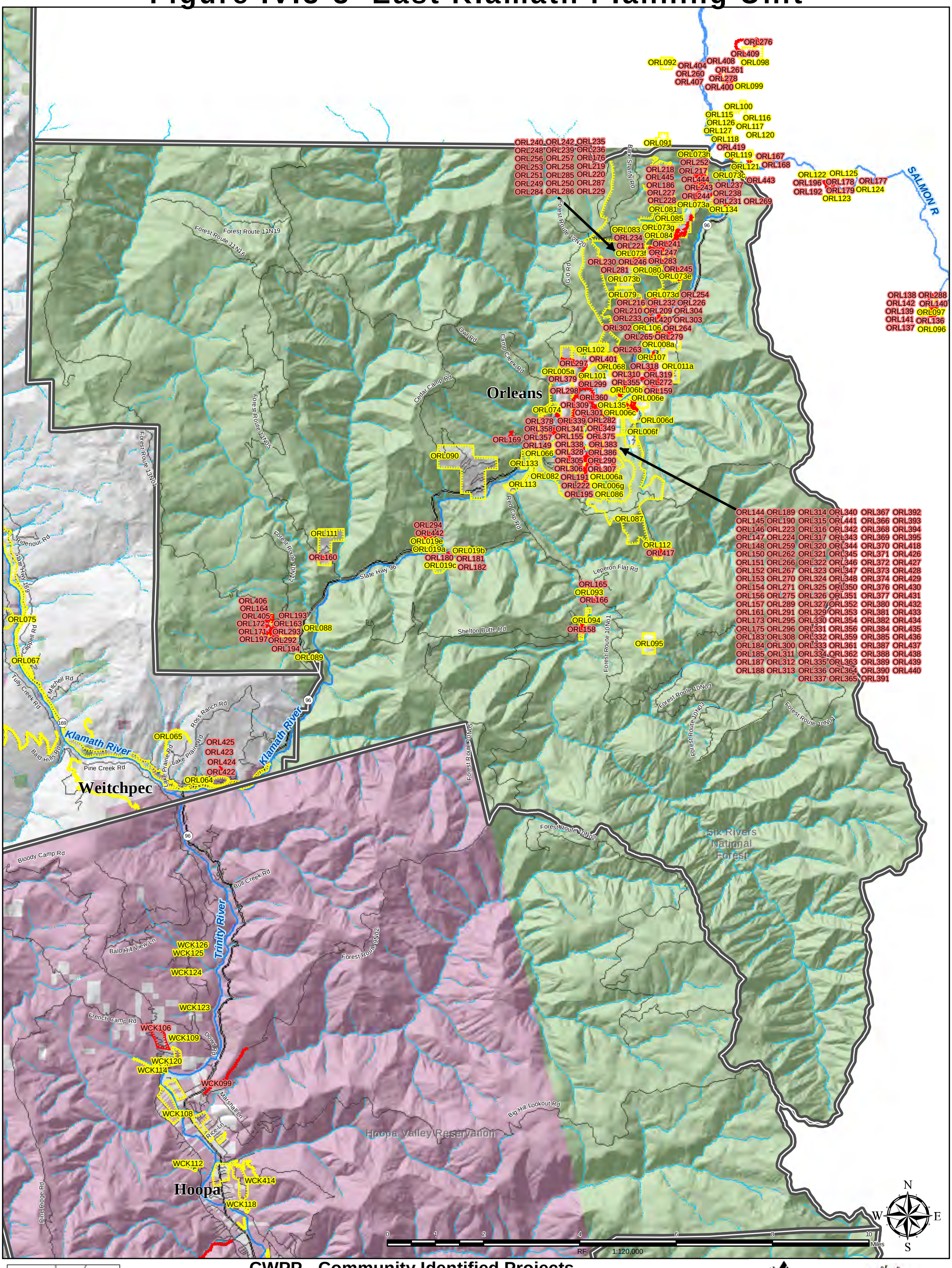
- CWPP PlanningUnit Boundary
- **Community Identified Features**
  - Protection/Evacuation
  - Value/Asset
  - Risk/Hazard
- **Land Ownership**
  - Parks/Public Land
  - Reservation/Tribal Land
  - Cities
- **Highways and Roads**
  - HWY 101
  - State HWY
  - HWY or Secondary Road
  - Local Road or Street
- **Hydrography**
  - Major River or Stream
  - Perennial Stream
  - Intermittent Stream

Land ownership and infrastructure data has been compiled by The County of Humboldt. Fire planning features identified at community workshops by residents; local, state, and federal fire service personnel; and Humboldt County staff. Other data sources were the 2006 Humboldt County Master Fire Protection Plan

This map is intended for planning purposes and should not be used for precise measurement or navigation.

Map compiled by County of Humboldt, March 2013.
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Contact: cimmit@co.humboldt.ca.us or jvondohlen@co.humboldt.ca.us

Figure IV.3-3 East Klamath Planning Unit

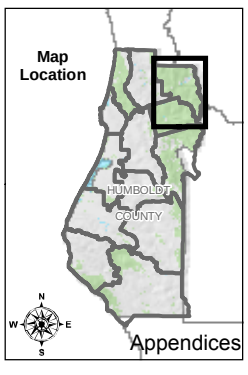


CWPP - Community Identified Projects

Legend

- CWPP Planning Unit Boundary
- **Community Identified Projects**
  - Proposed Project
  - Treated Project
- **Land Ownership**
  - Parks/Public Land
  - Reservation/Tribal Land
  - Cities
- **Highways and Roads**
  - HWY 101
  - State HWY
  - HWY or Secondary Road
  - Local Road or Street
- **Hydrography**
  - Major River or Stream
  - Perennial Stream
  - Intermittent Stream

Map Location



Land ownership and infrastructure data has been compiled by The County of Humboldt. Fire planning features identified at community workshops by residents; local, state, and federal fire service personnel; and Humboldt County staff. Other data sources were the 2006 Humboldt County Master Fire Protection Plan

This map is intended for planning purposes and should not be used for precise measurement or navigation.

Map compiled by County of Humboldt, March 2013,
Online maps visit: http://gis.co.humboldt.ca.us
Contact: cimmit@co.humboldt.ca.us or jvondohlen@co.humboldt.ca.us

IV.4. Hoopa Planning Unit Action Plan

IV.4.1. Hoopa Planning Unit Description

The Hoopa *Planning Unit* encompasses 114,144 acres situated in the northeastern region of Humboldt County, south of Orleans and north of Willow Creek. The Unit area is shaped like a square, with approximately 12 miles on each side. The Yurok Indian Reservation lies to the north, and Six Rivers National Forest borders the Unit's southern and eastern sides. The Unit, which consists of rugged, mountainous terrain and a broad valley, is part of the Trinity River *watershed*. The Trinity River and its *tributaries* bisect the valley, flowing in a northerly direction towards its confluence with the Klamath River near the town of Weitchpec, just north of the Unit. Highway 96 follows alongside the Trinity River and serves as the main transportation corridor in and out of the area.

The land in this Unit is encompassed within the Hoopa Valley Indian Reservation (HVIR), which "contains 90,519 acres and is the largest Indian Reservation in California."[1] The vast majority of the Unit is tribally owned, while less than 2% (1,553 acres) is private ownership. Approximately 2,600 people reside in this Planning Unit. The town of Hoopa comprises the community population center and Hoopa is, in fact, the only town within the boundaries of the Reservation. More populous areas of the Reservation include the Valley, Bald Hill, and Trinity Gorge. Other neighborhoods include Telescope Rd., Agency Field, Big Hill, Rice Lane, Upper and Lower Campbell, Hostler Field housing, and Norton Field Housing Authority.[2]

Most residences within this Unit exist in the *wildland-urban interface* (WUI). Average house values are approximately $94,000, and mobile homes make up 38% of the housing on the Reservation. The Hoopa Valley has a flat-to-moderate slope; the Valley is where all of the businesses, schools, the post office, the tribal offices, and the majority of residences are located. The balance of the Reservation is characterized by mountainous terrain with about 75% of the mountain slopes exceeding 40%.[3] A map of this Planning Unit can be viewed in Figure IV.4-1: Hoopa Unit: CWPP Unit Map.

IV.4.2. Hoopa Community Process Summary

A community workshop was held on June 18, 2012 at the Hoopa Tribal Council building for the purpose of gathering local information and garnering public input regarding various factors contributing to the extent of wildfire risk and/or preparedness among the communities in this Unit, and to provide information about the countywide community wildfire protection plan (CWPP) process. Those present discussed funding issues, plans for moving forward with the development of a Hoopa CWPP, and built upon the ongoing discussion of a potential local fire safe council (FSC). A group exercise, which involved maps of the Planning Unit area, invited those present to help identify and pinpoint on the map where particular *fire hazards* exist, the location of *protection resources*, such as fire water drafting sites, as well as values and *assets at risk* within the community that could be threatened by wildfire. These workshop processes also

[1] Hoopa Valley Tribe. (2011). *Wildfire Prevention Plan for the Hoopa Valley Indian Reservation, 2011-2015* [Draft]. Hoopa, CA.

[2] County of Humboldt, Natural Resources Planning. (2006, August). Appendix G: Community Identified Values, Protection Resources, Risks and Hazards, and Projects. *Humboldt County Master Fire Protection Plan.* Retrieved from http://www.co.humboldt.ca.us/natural-resources/fire_safe_council/fsc_mfpp_cwpp.aspx.

[3] Hoopa Valley Tribe. (2011). *Wildfire Prevention Plan for the Hoopa Valley Indian Reservation, 2011-2015* [Draft]. Hoopa, CA.

provided an opportunity for participating community members to ask questions and provide information based on their local knowledge.

Participants were also asked to review pre-existing information illustrated on the maps which had been added by community members during similar workshops that took place during the initial planning process in 2006. This workshop and mapping exercise also facilitated discussion among community members about potential actions that could be taken to reduce fire risk in their community. Through discussion and collaborative processes, participants identified major hazard areas and compiled lists of project proposals for enhancing their community's fire preparedness.

The community-identified fire hazards, protection resources, and values and assets at risk discussed throughout the following sections of this Planning Unit Action Plan reflect information generated by these community workshop mapping exercises, as well as information resulting from direct outreach to local fire departments and residents.

The project proposals resulting from community member discussions are contained in section IV.4.8. Community-Identified Projects in this Planning Unit Action Plan.

IV.4.3. Hoopa Wildfire Environment

Approximately 94% of the Hoopa Planning Unit is zoned "Very High *Fire Hazard Severity*," as determined by the California Department of Forestry and Fire Protection (CAL FIRE).[4] A small portion of the land area in the Valley, particularly along Highway 96, is zoned "High Fire Hazard Severity" (4%), while a negligible amount is zoned "Moderate Fire Hazard Severity." *Fire management* in the Reservation is divided into two Fire Management Zones (FMZs) by the Hoopa Wildland Fire Department's Prevention Plan. The first FMZ includes all the populated, WUI areas (Bald Hill, Gorge Valley, Valley West, and Highway 96) and contains 90% of the 10-year fire occurrence in just 47.3% of the Reservation acres. The second FMZ contains 52.7% of Reservation acres and only 10% of the 10-year fire occurrence; it is comprised of unpopulated, mountainous and forested areas with mostly steep terrain (Telescope, Pine, Hopkins, and Tish Tang).

The Unit is characterized by relatively wet, cool winters and dry summers. Local vegetation predominantly includes stands of Douglas-fir with white fir and red fir intermixed. Forests in the Reservation also contain "coastal redwood, giant sequoia, grand fir, western hemlock, western red cedar, incense cedar, Port Orford cedar, Jeffrey pine, ponderosa pine, sugar pine, and yew…stands of hardwoods (mostly oaks and Pacific madrone, with some pepperwood and red alder) are interspersed with the softwoods."[5] In the prairie lands, vegetation includes grass, ferns, wild rose, and briars.

Ecosystems and *plant communities* in this region are historically adapted to regular wildfire occurrence. Hoopa tribal members have traditionally implemented intentional burns throughout the Reservation area for ecological and cultural purposes. However, a heavy *fire suppression* campaign beginning in the 1930s has allowed the accumulation of dense, flammable vegetation in forest *understories*, which acts as *fuel* and increases the risk of high-intensity wildfires. Forest ecosystems, accustomed to low-intensity fires that would burn off *brush* and newer starts in the understory, become threatened by overcrowded forests and accumulated fuel. The extent that the *landscape* has been altered as a result of fire suppression is reflected in the *condition class* of the Unit area. Condition class describes the degree of departure from the historical *natural fire*

[4] CAL FIRE (California Department of Forestry and Fire Protection). (2007). *Fire Resources Assessment Program (FRAP).* [Map showing Fire Hazard Severity Zone ratings within various geographic areas, mapped by county]. Fire Hazard Severity Zones Map. Retrieved from http://frap.cdf.ca.gov/

[5] Hoopa Valley Tribe. (2011). *Wildfire Prevention Plan for the Hoopa Valley Indian Reservation, 2011-2015* [Draft]. Hoopa, CA.

regime. Where the condition class indicates that fire has been absent for an unnaturally long time, the hazard and potential damages are high to both the environment and human developments in the area. Approximately 60% of the Hoopa Planning Unit is condition class 3, meaning the fire regime is significantly altered from the historical range; and approximately 30% of the area is condition class 2, or moderately altered from the historical range.

Responsibility for wildfire management over the years has fallen to the Bureau of Indian Affairs (BIA) and the Hoopa Valley Tribe (HVT). Strategies have continued to strongly emphasize fire suppression, due to a large fire occurrence, with a ten year average of 194 wildfires annually.

In the past decade there has been frequent wildfire activity within and adjacent to the Unit. The names, year, and acreage covered by the most recent major fire events within this Unit are as follows:

- Megram Lightning Fire, October 1999: 4,830 Reservation acres.
- Hoopa Fire, July 1999: 54 acres.
- Shelton Fire, October 2001: 10 acres.
- Big Hill Fire, September-October 2002: 184 acres.
- Supply Creek #13 Fire, August- September 2002: 410 acres.
- Deerhorn Fire**,** September 2008**:**382 acres.
- Mill Creek 4 Fire, October-November 2009: 1,942 Reservation acres.

The costs associated with wildfire and other fire incidents between the years 1999-2010 in the Reservation are totaled at $14,157,993.[6]

Humans are responsible for nearly all fire *ignitions* in this Planning Unit. Arson has been an ongoing problem throughout the Reservation, to the extent that arson or suspicion of arson has represented 90% of fire causes in the past decade. Less common ignitions result from campfires, trash burning and brush clearing, vehicles, and fireworks. Lightning is the sole natural cause for fires reported on the Reservation and is only responsible for 0.54% of fire starts in the past 12 years.[7] Accumulations of hardwood leaf *litter* as well as pine needle litter, tall grasses, ferns, brush and briars, large patches of huckleberry and downed woody debris can act as *hazardous fuel* that increase risk of ignition.

Dead plant matter and vegetation with low *moisture levels* within 100-150 feet of homesteads pose some of the greatest threats to *structural ignitability*. Of particular concern are houses with needles and leaves accumulating on rooftops or in rain gutters. Houses with wooden rooftops and siding add to this risk, as do the presence of wooden decks, particularly those with dead plant matter accumulated beneath them. The high percentage of mobile homes in the Unit is another concern for structural ignitability. Mobile homes are subject to the same risks as built houses regarding the accumulation of fuels on or nearby the structure; however, if ignition does occur, mobile homes have a greater propensity to burn rapidly and completely. Figure IV.4-2 found at the end of this Unit Action Plan illustrates risks and hazards identified by community members at public workshops and can be used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt County Web GIS Portal, "Fire Planning" section: http://gis.co.humboldt.ca.us/.

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[6] Hoopa Wildland Fire Department. (2012). *12 Year Hoopa Wildland Fire Analysis* [Printed handout document distributed at Humboldt County CWPP community workshop meeting on June 18, 2012 at the Hoopa Tribal Council building]. Hoopa, CA.

[7] Hoopa Valley Tribe. (2011). *Wildfire Prevention Plan for the Hoopa Valley Indian Reservation, 2011-2015* [Draft]. Hoopa, CA.

Highway 96 is the central *ingress and egress* route, with numerous smaller roads connecting residences and neighborhoods to it. Most of the structures within the Unit are not far from the main highway, but a few neighborhood groupings are more remote. The narrowness of smaller roads leading to remote residences could create complications for emergency vehicle response trying to gain access during simultaneous home evacuations. Landslides resulting from heavy rains falling on snow melt in the late winter and early spring could inhibit access and create hazardous road conditions.

The Hoopa Valley Public Utilities District provides potable water and *fire protection water* throughout the Hoopa Valley Reservation. Fire protection water may also be *drafted* from the following locations:[8]

- Legion Way – river access
- Tish Tang Rd.--river access
- Mill Creek
- The Mine
- Overhead fill on Supply Creek Rd.

The map in Figure IV.4-2 found at the end of this Unit Action Plan illustrates these *drafting sites* as well as other community-identified wildfire *protection resources*. The map can be used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt County Web GIS Portal, "Fire Planning" section: http://gis.co.humboldt.ca.us/.

IV.4.4. Hoopa Values and Assets at Risk

Assets at risk can be defined as those things that are important to quality of life that can be threatened with destruction or loss from wildfire. These may include community assets such as homes and businesses, as well as environmental values such as wildlife habitat, natural resources, and air quality, along with any other important attribute that individual communities rely on for their well being. Loss or damage to community assets as a result of wildfire can have short- or long-term impacts of varying severity, depending on the asset. Short-term loss caused by a *wildfire* can include the destruction of residences, commercial assets, timber, wildlife habitat, scenic vistas, and *watersheds*. Long-term effects may include displaced persons, smaller timber harvests, reduced access to affected recreational areas, and destruction of cultural, ecological, and economic resources, and community infrastructure.

The majority of *assets at risk* in this Planning Unit are residential homes and tribal facilities, along with a variety of commercial and service industries, community centers, medical and dental clinics, schools, museums, as well as infrastructure components, such as a water treatment facility. The Lucky Bear Casino is a noteworthy asset as well. The Unit also contains a prominent campground area, known as Tish Tang.

The map in Figure IV.4-2 found at the end of this Unit Action Plan illustrates values and assets at risk to wildfire identified by community members at public workshops. The map can be used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt County Web GIS[9] Portal, "Fire Planning" section: http://gis.co.humboldt.ca.us/. Some of the community-identified assets at risk within this Unit include:

- Kimaw Medical Center, dental clinic, & rest home.
- Norton Field Housing Authority
- Cell tower on Bald Hill Rd. (TV, radio, phone)
- Bair Rd. to Hoopa (evacuation route)

[8] County of Humboldt, Natural Resources Planning. (2006, August). Appendix G: Community Identified Values, Protection Resources, Risks and Hazards, and Projects. *Humboldt County Master Fire Protection Plan.*

[9] Geographic Information Systems (GIS).

Timber is a highly significant commercial asset in this unit; 75,000 acres of the approximately 82,000 acres of forest are comprised of *merchantable timber*. Timber values on the Reservation are estimated in excess of $300,000,000, and this figure does not include young, growing stock or plantations.[10] The Trinity River is also an asset at risk. The Tribe relies on the River's salmon populations for subsistence and ceremonial purposes, and low water levels can have devastating impacts on their *ecosystems*.[11] Numerous areas throughout the Reservation are held in high regard for cultural reasons as well.

IV.4.5. Hoopa Community Preparedness

Community fire awareness and preparedness in this unit is abetted by the *Wildfire Prevention Plan for the Hoopa Valley Indian Reservation, 2011-2015*, which will replace the 2005-2010 Plan. The primary objective of this plan is to reduce unwanted human-caused ignitions, and it is intended to "provide direction and guidance for the implementation of wildfire prevention and hazard mitigation strategies within the boundaries of the HVIR based on the historical *wildland fire* problems."[12]

The Hoopa Forestry Department offers guidance to residents on how to plan for fire safety in their Ten Year Comprehensive Fuels Management Plan, which has been approved by the tribal government. The Department also competes for grant funding for conducting fire *hazard mitigation* projects on the Reservation and can conduct home risk assessments throughout the community.

Despite a lack of funding from the BIA, the Hoopa Wildland Fire Department (HWFD) has developed a fire prevention strategy that emphasizes the importance of enforcement in deterring incendiary fires. However, a lack of authority to prosecute suspected arsonists has stunted the growth of the program. This prevention program was greatly abetted when the CAL FIRE Arson Task Force started operations in Hoopa, beginning in July 2008. The presence of CAL FIRE arson investigators on patrol with full arrest authority led to a dramatic decrease in human-caused ignitions during the remainder of 2008. This task force continued operations during the fire season in 2009 and 2010 with similarly positive results.

When funding is available, the HWFD has also incorporated culturally sensitive fire prevention education in local primary and elementary schools. Additionally, when affordable, the HWFD participates in public outreach events such as local and county fairs, and *Fire Safe* days.

The Hoopa Tribe recently received funds to draft a hazard mitigation plan which will include a section for a *community wildfire protection plan* (CWPP). It is hoped that the CWPP will help set priorities for wildfire mitigation projects, inspire local wildfire preparedness action, and leverage funding to support projects. The Hoopa Tribal Council is currently discussing the possibility of creating its own local *fire safe council* (FSC) to assist with CWPP development and implementation.

The Hoopa Valley Tribe and various tribal departments can be reached by calling (530)-625-4795 or by visiting their website at: http://www.hoopa-nsn.gov/.

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[10] Hoopa Valley Tribe. (2011). *Wildfire Prevention Plan for the Hoopa Valley Indian Reservation, 2011-2015* [Draft]. Hoopa, CA.

[11] County of Humboldt, Natural Resources Planning. (2008). *Humboldt Operational Area Hazard Mitigation Plan; Volume 2 – Planning Partner Annexes.* (pp.2-7.) Retrieved from http://www.co.humboldt.ca.us/natural-resources/hazardmitigation/?inc=finaldraft

[12] Hoopa Valley Tribe. (2011). *Wildfire Prevention Plan for the Hoopa Valley Indian Reservation, 2011-2015* [Draft]. Hoopa, CA.

IV.4.6. Hoopa Wildfire Protection Capabilities

The Hoopa *Volunteer Fire Company* (HVFC) is an all-risk organization with *structural fire* suppression as its primary mission. The HVFC was established by the Hoopa Valley Tribal Council and provides service to approximately 3,000 residents within 144 square miles[13]. It is made up of 14 volunteers, and their *apparatuses* include: one type-1 engine, one type-3 engine,, one rescue utility vehicle, a command vehicle, and a Yamaha jet outboard unit. The HVFC can be reached by calling (530) 625-1118.

The HVFC has a *mutual aid agreement* with the HWFD, which is primarily responsible for *wildland fires*, but can also assist in other emergency situations. CAL FIRE does not provide fire protection in the Hoopa Valley Indian Reservation, but will respond if assistance is requested. The HWFD is supported by ten full-time members, seven temporary members, and six seasonal members. Their apparatuses include: four type-3 engines, two type-4 quick attack engines, and one *water tender*. The HWFD can be reached by calling (530) 625-4366.

The HVFC is in need of more volunteers, particularly those who can be available all day, every day, as many volunteers are unavailable to respond during business hours, due to jobs or childcare responsibilities. Overgrown brush and tree limbs along roadways and in residential driveways can pose challenges to emergency response vehicle access. Similarly, brush accumulation around fire hydrants can be a hazardous issue.

IV.4.7. Hoopa Evacuation

Evacuation from the Hoopa Planning Unit will travel either north or south along Highway 96, depending on law enforcement recommendations based on *fire behavior*, wind pattern, traffic, and ingress of emergency vehicles. There are numerous smaller roads connecting residences and neighborhoods to Highway 96. Adequate ingress and egress along these roads is vital to residents that may need to access the main highway *evacuation route* and for firefighters responding to wildfires near these neighborhoods.

The following are potential alternative evacuation routes; however, most of these roads are narrow and windy, traversing unpopulated and steep terrain and would therefore not be ideal for massive evacuation efforts:

- Mill Creek Road, leads northeast to Orleans
- Big Hill Road, leads east into Six Rivers National Forest territory
- Bair Road, provides westward access toward Redwood Valley and 299, via Stover Road
- Bloody Camp and Dowd Roads, provide northern access
- Pine Creek Road, leads north to Bald Hill Road which connects with town of Orick

Evacuation impediments may include: landslides, fallen trees, downed power lines, overgrown vegetation, poorly marked streets and intersections, and *one-way-in, one-way-out roads* that could inhibit evacuation and emergency response vehicles, or leave residents stranded should the roads become blocked.

During wildfire events that have the potential to threaten personal safety, community evacuation sites may be established where residents can go to survive a wildfire. Evacuation sites will be established in different locations depending on the anticipated path of the wildfire. The determination for the location of these sites is normally made by Humboldt County Emergency Operations Center Incident Commander in cooperation with an *Incident Management Team.* The

[13]Humboldt County Fire Chiefs Association. (2012). 2012 Local Fire Protection Survey.

Humboldt County Sheriffs and Emergency Officials will use mass communication and door-to-door methods to inform residents about the threat and where residents should go to take shelter.

If a catastrophic event occurs, residents may not be able to reach designated evacuation sites. In such cases, residents may need to make decisions on their own about seeking shelter where they can survive the passage of the wildfire until they can reach an evacuation site. It can be very difficult to determine the right thing to do as the fire approaches. Before a wildfire threatens, community members should talk to their local fire department about evacuation procedures in their neighborhood.

See section V.2.3 in Part V. Fire-Safe Communities for more information on preparing for safe evacuation and evacuation planning for pets and livestock. Also see section II.3.5 Evacuation Routes and Vulnerability in Part II. Risk Assessment for information about evacuation procedures and challenges in Humboldt County.

IV.4.8. Community Identified Potential Projects

The following matrix includes community identified proposed projects based on input from the community processes discussed above. A detailed description of each heading in the matrix can be found in Appendix G: Descriptive Characteristics for Community Identified Projects Matrix. These projects are illustrated on the community-identified projects map found at the end of this Unit Action Plan (Figure IV.4-3). Projects include those carried over from the 2006 fire-planning process and those identified and refined during the 2012 County CWPP update process. This information can also be viewed on the fire planning GIS Portal. The GIS Portal allows users to search for and view specific fire planning features by location or to zoom into a desired area from an aerial view. To access the Portal, go to: http://gis.co.humboldt.ca.us/ and choose “Fire Planning” from the list of mapping applications. The data collected through this Planning process are included in the GIS layers within the Portal.

No vegetation *treatments* recommended in this plan will be carried out without the consent and involvement of the property owner and all applicable local, state and federal regulations must be observed.

LOCATION		Treatment/Project Information Eel Fire Planning Unit							
Number Corresponds with location on map	Community, Structure, or Area (Value at Risk)	Description	Status	Year	Type	Acres	Veg Type	Maintenance (actual or proposed)	Funding source (actual or proposed)
WCK120	Bald Hill, below cell tower	Bald Hill brush removal- Hoopa	Treat-Med		Landscape	52.85			grant-landowner-Assn.
WCK112	Redwood Grove Rd near Pine Creek Rd	Redwood Grove brush removal fuels reduction-Hoopa	Treat-Med		Roadside Clearance	26.78			grant-landowner-Assn.
WCK118	Community Service Road	Community Service Rd brushing-Hoopa	Treat-Med		Roadside Clearance				grant-landowner-Assn.
WCK108	both sides of Hwy 96, center area of Hoopa	brush removal on State fee lands- Hoopa	Treat-Med		Roadside Clearance				grant-landowner-Assn.
WCK115	Telescope Peak Road	Telescope fuels reduction-Hoopa	Treat-Med		Landscape				grant-landowner-Assn.
WCK121	Campbell Creek/ Tish Tang	Campbell Creek brush removal-Hoopa	Treat-Med		Landscape				grant-landowner-Assn.
WCK114	Beaver Creek Rd/Pine Creek Rd	Beaver Creek Rd fuelbreak-Hoopa	Treat-Med		Roadside Clearance				grant-landowner-Assn.

LOCATION		Treatment/Project Information Eel Fire Planning Unit							
Number Corresponds with location on map	**Community, Structure, or Area (Value at Risk)**	**Description**	**Status**	**Year**	**Type**	**Acres**	**Veg Type**	**Maintenance (actual or proposed)**	**Funding source (actual or proposed)**
WCK414	Hostler Ridge Rd	Hostler Ridge - Piles need to be burned, retreated as shaded fuelbreak	Treat-Med	2012	Roadside Clearance				
WCK109	Dowd Rd, .5 mi. N of intersect w/ French Camp Rd	water tank on Dowd Road - Hoopa	Action Need	2010	Other - Water				grant-landowner-Assn.
WCK123	Dowd Rd, 1.25 mi. N of intersect French Camp Rd	water tank on Dowd Road - Hoopa	Action Need	2010	Other - Water				grant-landowner-Assn.
WCK124	Dowd Rd, 2.1 mi. N of intersect French Camp Rd	water tank on Dowd Road - Hoopa	Action Need	2010	Other - Water				grant-landowner-Assn.
WCK126	Dowd Rd, 2.88 mi. N of intersect French Camp Rd	water tank on Dowd Road - Hoopa	Action Need	2010	Other - Water				grant-landowner-Assn.
WCK125	Dowd Rd, 2.67mi. N of intersect French Camp Rd	water tank on Dowd Road - Hoopa	Action Need	2010	Other - Water				grant-landowner-Assn.

Humboldt County Community Wildfire Protection Plan

LOCATION		Treatment/Project Information Eel Fire Planning Unit							
Number Corresponds with location on map	**Community, Structure, or Area (Value at Risk)**	**Description**	**Status**	**Year**	**Type**	**Acres**	**Veg Type**	**Maintenance (actual or proposed)**	**Funding source (actual or proposed)**
WCK116	Telescope Peak Road	develop water source & tank Telescope Peak Rd- needs hardware-Hoopa	Action Need	2010	Other - Water				grant-landowner-Assn.
WCK411	Heck Creek drainage, Hoopa	Break up continuity of hazardous fuel buildup	Treat-Med	2012	Landscape				
WCK412	Tish Tang Campground, Hoopa	Hazardous vegetation clearance around campground	Treat-Med	2012	Landscape				
WCK413	Tish Tang North Campground, Hoopa	Hazardous vegetation clearance around campground north	Treat-Med	2012	Landscape				

Humboldt County Community Wildfire Protection Plan

LOCATION		Treatment/Project Information Eel Fire Planning Unit							
Number Corresponds with location on map	**Community, Structure, or Area (Value at Risk)**	**Description**	**Status**	**Year**	**Type**	**Acres**	**Veg Type**	**Maintenance (actual or proposed)**	**Funding source (actual or proposed)**
WCK416	Campbell Field Road, Hoopa	High winds and fuel buildup. Highest fire occurrence in last 10 yrs - Needs Fuel clearance	Treat-High	2012	Landscape				

IV.4.9. Hoopa Action Plan

The following items are the initial priorities for community action for the Hoopa Planning Unit as recommended by this Humboldt County CWPP (not listed in order of priority). In an ideal world, everything recommended here would be implemented. However, it must be understood that implementation will be subject to the availability of funds and other resources and the willingness/ability of community members and Plan Partners to take action. This Action Plan can be cited in grant applications to leverage needed implementation funds and used to guide and inspire action.

Enhancing Fire Protection

- **Sustainable Fire Departments:** Community members within this Planning Unit should support their local fire department[14] through activities such as volunteering as firefighters or auxiliary members, making donations, supporting fundraisers, writing grants, and/or helping with administrative tasks. With community support, local fire departments can continue to provide a wide variety of vital emergency services.
- **Firefighting Water:** Increase the availability of water for fire protection by making water access locations known to fire departments and investing in more community water tanks. Neighborhood and road associations and/or *Firewise* Communities work with local fire departments to develop a *"Blue Dot" program*, which identifies the location of firefighting water sources by marking them with a blue reflective dot. This program also ensures that tanks and water systems are outfitted with fittings compatible with firefighting equipment. Begin by identifying where such a program is most needed. Focus initial efforts in the following areas:
    - Neighborhood along Telescope Peak Road.
    - Dowd Road, west of Highway 96, north of town.

Creating Fire Safe Communities

- **Firewise Communities:** Pursue participation in the Firewise Communities/USA recognition program with neighborhood groups in developed areas adjacent to the wildland, particularly where there are many residences located along dead-end roads. Actively implement and maintain the Firewise action plan on an annual schedule.

Reducing Wildfire Fuels (Flammable Vegetation)

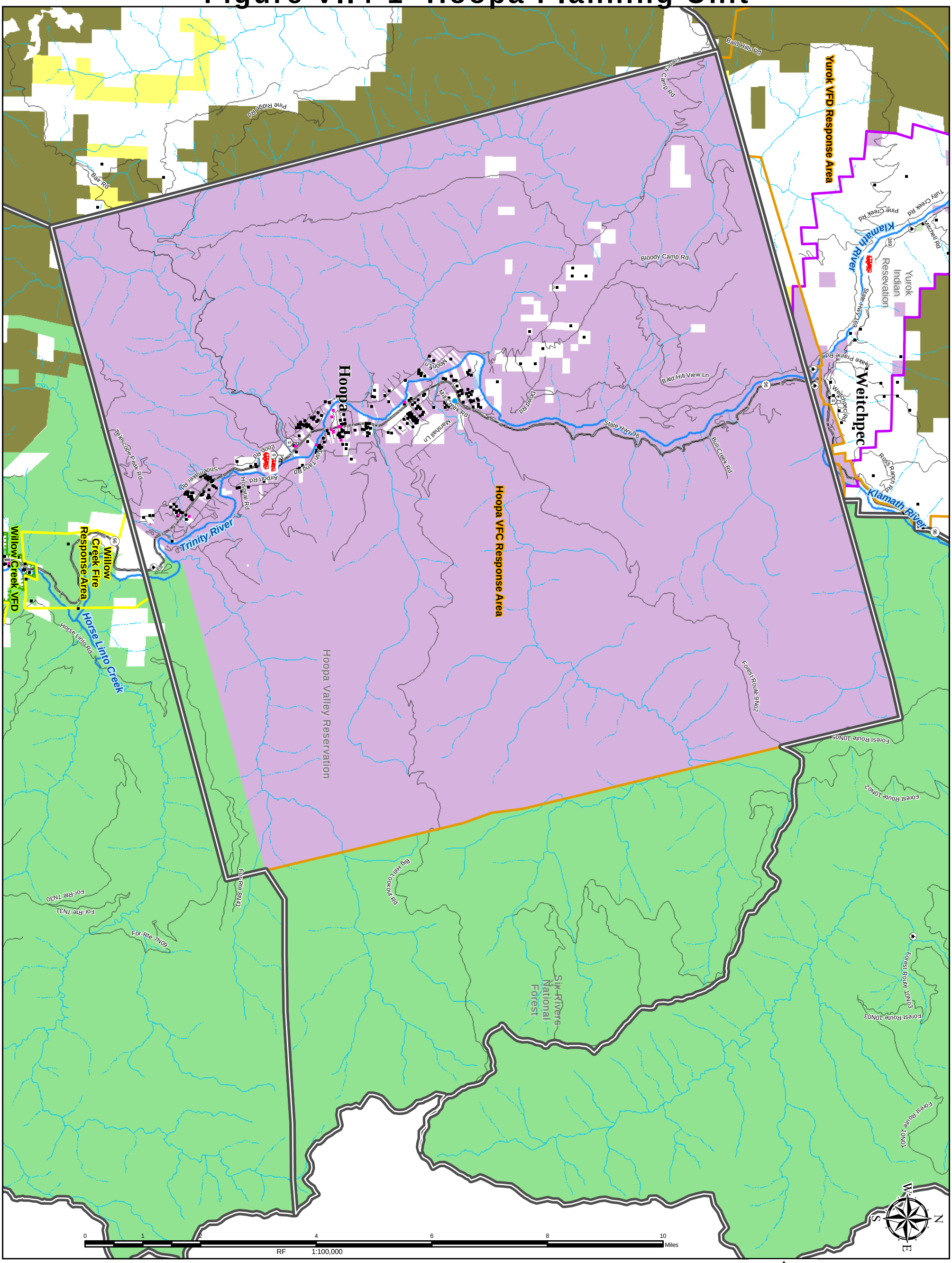
- **Roadside Clearance:** Manage roadside vegetation in order to improve and maintain access for emergency vehicles and ensure safe evacuation. Consider working with the California Conservation Corps or County Public Works Roads Division. Focus initial efforts along the following roads:
    - Redwood Grove Road, near Pine Creek Road.
    - Community Service Road.
    - Both sides of Highway 96.
    - Hostler Ridge Road.
    - Beaver Creek Road, near Pine Creek Road.
- **Landscape Fuels Reduction:** Construct *shaded fuelbreaks* as buffers between residential areas and wildlands to slow the progress of wildfires. This allows firefighters a higher probability of successfully protecting communities from wildfire damage. These buffers

[14] *All local fire departments within this unit are listed above with their contact information in the "Wildfire Protection Capabilities" section.*

may also protect the wildlands from the spread of fires originating within communities. The following areas are recommended for priority treatment in this plan:

- Hazardous vegetation clearance in and around Tish Tang Campgrounds.
- Break up continuous fuels near Heck Creek drainage.
- Fuel clearance around Campbell Field Road, an area with high winds and high fire occurrence.

Figure VI.4-1 Hoopa Planning Unit



Map Location

Appendices

CWPP Unit Map

Legend

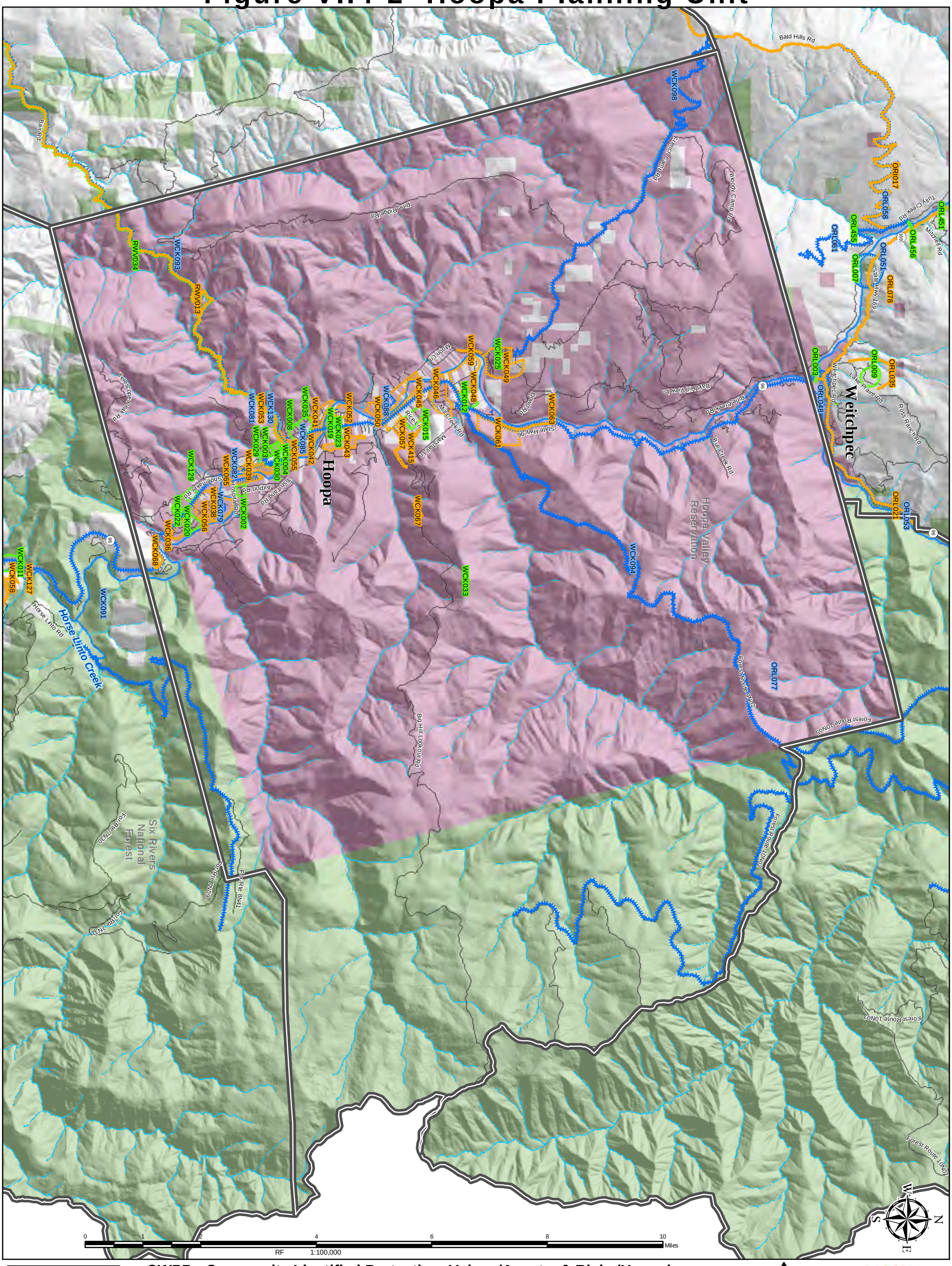
- CWPP Planning Unit Boundary
- **Emergency Response**
  - Local Fire Station
  - CAL Fire Station
  - Six Rivers Fire Station
- Hospitals and Clinics
  - Hospital/Medical Center
  - Red Cross
- **Lookout, Lights, Radio**
  - Lighthouse
  - School
- **Local Fire Organization Response Area**
  - District
  - Out of District
  - Non-Tax (Volunteer Fire Company (VFC))
  - Proposed District Annexation Area (PDAA)
- **Improved Parcels**
  - Improved Parcel (not actual location of improvement)
  - Commercial or Industrial Lot (not actual location)
- **Airports**
  - Landing Strip
- **Highways and Roads**
  - HWY 101
  - State HWY
  - HWY or Secondary Road
  - Local Road or Street
- **Hydrography**
  - Major River or Stream
- **Infrastructure**
  - Gauging Station
  - Water Tank or Source
  - Historic Locations
- **Land Ownership**
  - AGENCY
  - Bureau of Land Management
  - National Park Service
  - State Park or Other State Lands
  - Six Rivers National Forest
  - U.S. Fish and Wildlife Service
  - Tribal Lands
  - Private
  - Industrial Timber
  - Cities
  - Reservation Boundary

Land ownership and infrastructure data has been compiled by The County of Humboldt. Fire planning features identified at community workshops by residents; local, state, and federal fire service personnel; and Humboldt County staff. Other data sources were the 2006 Humboldt County Master Fire Protection Plan

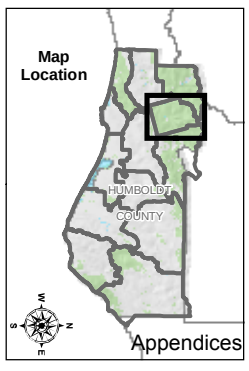
This map is intended for planning purposes and should not be used for precise measurement or navigation.

Map compiled by County of Humboldt, March 2013.
Online maps visit: http://gis.co.humboldt.ca.us
Contact: cimmit@co.humboldt.ca.us or jvondohlen@co.humboldt.ca.us

Figure VI.4-2 Hoopa Planning Unit



CWPP - Community Identified Protection, Values/Assets, & Risks/Hazards



Legend

- CWPP Planning Unit Boundary

Community Identified Features

- Protection/Evacuation
- Value/Asset
- Risk/Hazard

Land Ownership

- Parks/Public Land
- Reservation/Tribal Land
- Cities

Highways and Roads

- HWY 101
- State HWY
- HWY or Secondary Road
- Local Road or Street

Hydrography

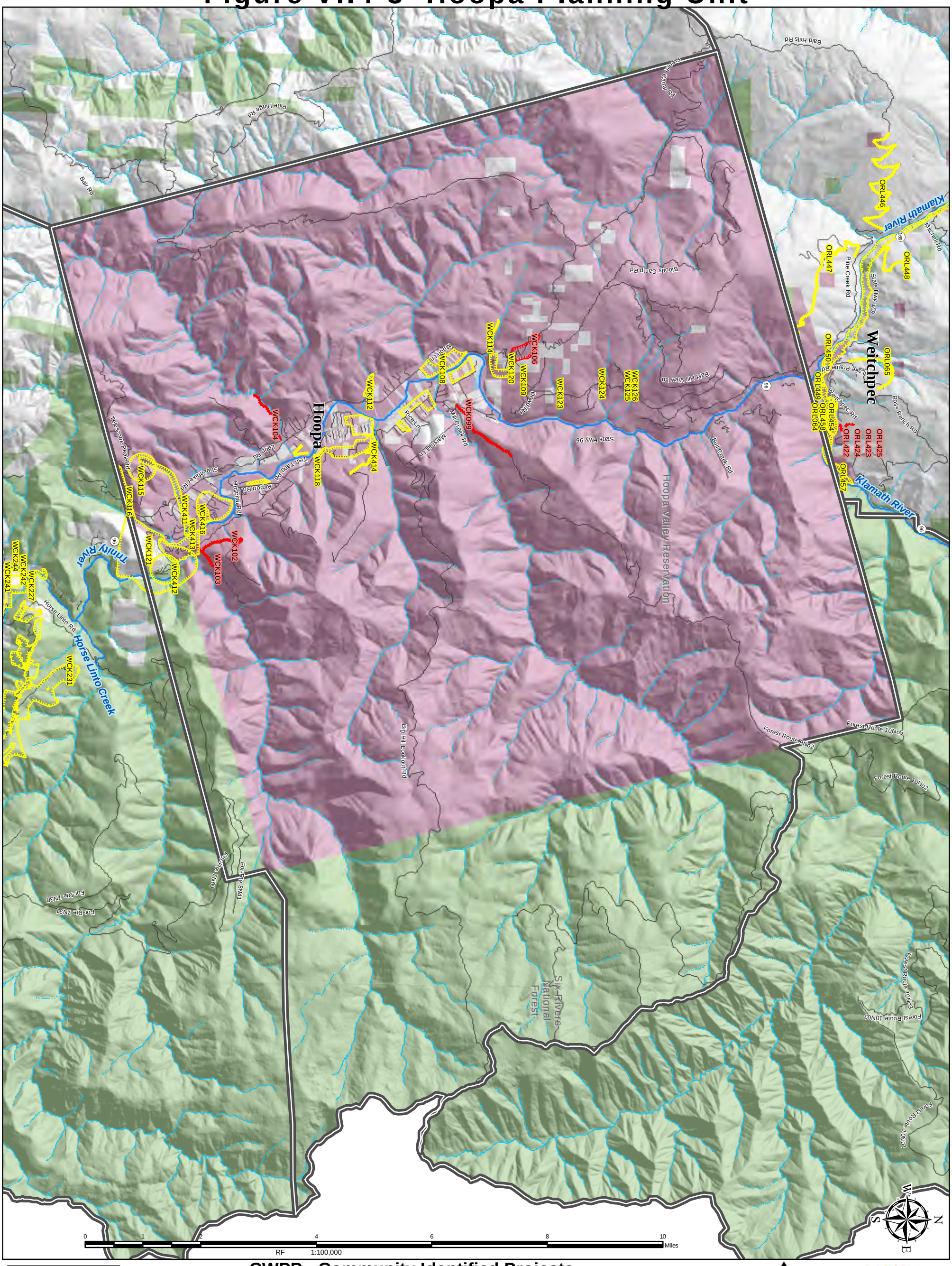
- Major River or Stream
- Perennial Stream
- Intermittent Stream

Land ownership and infrastructure data has been compiled by The County of Humboldt. Fire planning features identified at community workshops by residents; local, state, and federal fire service personnel; and Humboldt County staff. Other data sources were the 2006 Humboldt County Master Fire Protection Plan

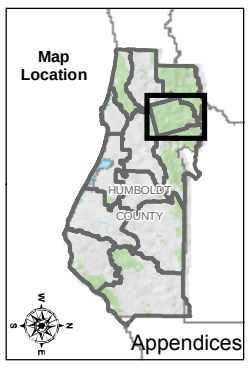
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Map compiled by County of Humboldt, March 2013
Online maps visit: http://gis.co.humboldt.ca.us
Contact: cimmit@co.humboldt.ca.us or jvondohlen@co.humboldt.ca.us

Figure VI.4-3 Hoopa Planning Unit



CWPP - Community Identified Projects



Legend

- CWPP Planning Unit Boundary
- **Community Identified Projects**
  - Proposed Project
  - Treated Project
- **Land Ownership**
  - Parks/Public Land
  - Reservation/Tribal Land
  - Cities
- **Highways and Roads**
  - HWY 101
  - State HWY
  - HWY or Secondary Road
  - Local Road or Street
- **Hydrography**
  - Major River or Stream
  - Perennial Stream
  - Intermittent Stream

Land ownership and infrastructure data has been compiled by The County of Humboldt. Fire planning features identified at community workshops by residents; local, state, and federal fire service personnel; and Humboldt County staff. Other data sources were the 2006 Humboldt County Master Fire Protection Plan

This map is intended for planning purposes and should not be used for precise measurement or navigation.

Map compiled by County of Humboldt, March 2013.
Online maps visit: http://gis.co.humboldt.ca.us
Contact: cimmit@co.humboldt.ca.us or jvondohlen@co.humboldt.ca.us

IV.5. Trinidad Planning Unit Action Plan

IV.5.1. Trinidad Planning Unit Description

The Trinidad *Planning Unit* encompasses 67,379 acres situated on the northern coast of Humboldt County. The Planning Unit is bordered by Redwood National Park on the northeastern side, the Pacific Ocean to the west, and the unincorporated town of McKinleyville to the south. Highway 101 is the main transportation route, which runs north-to-south, parallel to the ocean. The Trinidad *watershed* is the smallest watershed in the county, with 83,684 acres spread along the Pacific coastline; it contains Maple Creek and Little River as its primary fresh-waterways, both of which reach less than 20 miles inland.

The City of Trinidad, which was incorporated in 1870, comprises the community population center of this Planning Unit. Although the local population is small, containing less than 400 people, "the City of Trinidad acts as the commerce hub for around 1,500 inhabitants in the surrounding unincorporated communities, including Westhaven, Patrick's Point and Big Lagoon."[1] More than 350 years ago, the Tsurai Indians settled this area and established a village along the bluff at Trinidad Head. Today, Trinidad is bordered by the Trinidad Indian Rancheria, where descendants from the Yurok, Weott, and Tolowa peoples make up the Cher-Ae Heights Indian Community. During the 1849 California Gold Rush, Trinidad underwent rapid economic growth as a main supply stop for gold seekers. The town's harbor also facilitated economic activity in the area as a whaling station, a seaport for shipping lumber, and as a fishing destination. Well-known for its picturesque coastline and harbor, Trinidad and its surrounding areas, including Patrick's Point State Park and other public beaches, make this Unit a popular tourist destination.

The Community of Westhaven is another population center within this Unit. Westhaven is an unincorporated area that roughly encompasses the coastal area just north of Moonstone Beach and south of the City of Trinidad. The majority of the population resides within or adjacent to the boundary of the Westhaven *Community Services District* (WCSD). The WCSD is approximately 384 acres in size and serves a population of approximately 500.

The western portion of the Unit is lined with private parcels containing dense clusters of structures surrounded by industrial timber lands from Westhaven up to Stone Lagoon, with a single tract of ranchland located east of Westhaven. Parcels in this Planning Unit span a variety of types, from "million dollar" homes with stellar ocean views, to rental units and RV parks near the freeway. Parcel sizes range anywhere from one-eighth of an acre to seven acres. The majority of homes are stick built, any many have been upgraded within the last decade. The entire central and eastern portions of the Unit are comprised of timberlands managed by Green Diamond Resource Company. State Park areas such as Patrick's Point, Trinidad Beach, and Big Lagoon are scattered along the coastline. A map of this planning unit can be viewed in Figure IV.5-1. Trinidad Unit: CWPP Unit Map.

IV.5.2. Trinidad Community Process Summary

A community workshop was hosted by the Westhaven Fire Company at their fire hall on June 14, 2012 for the purpose of gathering local information and garnering public input regarding various factors contributing to the extent of wildfire risk and/or preparedness among the communities in this Unit, and to provide information about the countywide *community wildfire protection plan* (CWPP) update process. Participants included residents, volunteer

[1]County of Humboldt, Natural Resources Planning. (2008). *Humboldt Operational Area Hazard Mitigation Plan; Volume 2 – Planning Partner Annexes.* (p. 9-1.) Retrieved from http://www.co.humboldt.ca.us/natural-resources/hazardmitigation/?inc=finaldraft

firefighters, a representative from the Trinidad Public Works Department, personnel from both the Trinidad and Elk Camp California Department of Forestry and Fire Protection (CAL FIRE) Stations, a Green Diamond Resource Company representative, and a representative from the Regional Training Institute on Community Disaster Preparedness from Humboldt State University.

A group exercise, which involved maps of the Planning Unit area, invited those present to help identify and pinpoint on the map where particular *fire hazards* exist, the location of *protection resources*, such as fire water drafting sites, as well as values and *assets at risk* within the community that could be threatened by *wildfire*. These workshop processes also provided an opportunity for participating community members to ask questions and provide information based on their local knowledge.

Participants were also asked to review pre-existing information illustrated on the maps which had been added by community members during similar workshops that took place during the initial planning process in 2006. This workshop and mapping exercise also facilitated discussion among community members about potential actions that could be taken to reduce fire risk in their community. Through discussion and collaborative processes, participants identified major hazard areas and compiled lists of project proposals for enhancing their community's fire preparedness.

The community-identified fire hazards, protection resources, and values and assets at risk discussed throughout the following sections of this Planning Unit Action Plan reflect information generated by these community workshop mapping exercises, as well as information resulting from direct outreach to local fire departments and residents.

The project proposals resulting from community member discussions are contained in section IV.5.8. Community-Identified Projects in this Planning Unit Action Plan.

IV.5.3. Trinidad Wildfire Environment

Approximately 32% of the Trinidad Planning Unit is zoned "Moderate *Fire Hazard Severity*," as determined by CAL FIRE,[2] including all of the populated areas along the coastline. Nearly the entire remaining Unit area containing timberlands is zoned "High Fire Hazard Severity" (68%). The Unit is composed of coastal headlands and bluffs overlooking the ocean, as well as *riparian* areas and mountainous forests.

Climate in this Planning Unit is heavily influenced by its proximity to the Pacific Coast and high humidity prevails throughout the year. There are distinct rainy and dry seasons as well as frequent fog. Local vegetation predominantly includes redwood forests, along with some oak woodlands and pine forests.[3] Although the climate is dominated by moist, cooler temperatures, every 25-50 years the area experiences severe summer/fall droughts, accompanied by strong, dry offshore winds which have a warming, Mediterranean-like effect on the microclimate—a phenomenon known as the Klamtanas. The Klamtanas likely play a role in the presence of

[2] CAL FIRE (California Department of Forestry and Fire Protection). (2007). *Fire Resources Assessment Program (FRAP).* [Map showing Fire Hazard Severity Zone ratings within various geographic areas, mapped by county]. Fire Hazard Severity Zones Map. Retrieved from http://frap.cdf.ca.gov/

[3] County of Humboldt, Natural Resources Planning & Humboldt County Fire Safe Council. (2012). *Humboldt County Hazardous Fuels Reduction Plan Update 2009-2010.* (p.87.) Retrieved from http://www.co.humboldt.ca.us/natural-resources/fire_safe_council/

Bishop Pines in this Planning Unit, which favor coastal environments but are not typically found this far north.[4]

Traditional forest management methods used by Native Americans in this region typically incorporated low-intensity, intentional burns that helped facilitate the production of cultural and ecological resources. However, a national policy beginning in the 1930s that emphasized *fire suppression* in forest management systems has allowed the accumulation of dense, flammable vegetation in forest *understories*, which acts as *fuel* and increases the risk of high-intensity wildfires. Logging operations in the area that incorporated clear-cuts have also contributed to alterations in *stand compositions*. Forest *ecosystems* adapted to low-intensity fires that would burn off *brush* and newer starts in the understory are now threatened by overcrowded forests and accumulated fuels in some areas of the Unit.

In recent years, Green Diamond Resource Company (GDRCo) has undertaken efforts to help reduce risk of fire occurrences on their properties. Firefighting equipment is maintained at logging operations and inside all vehicles; harvesting operations are suspended at specified levels of low *relative humidity*; and logging crews are required to make daily fire inspections after work is done during *fire season*. Furthermore, the company maintains fire trucks and heavy equipment for wildfire emergencies and GDRCo Forestry staff, logging and maintenance crews, and contractors are all available to respond to fire emergencies on the company's timberlands and to assist CAL FIRE at their request. The company also treats logging fuels in a variety of ways to help reduce *fire hazards*. Their methods include piling and burning, *broadcast burning*, mastication and on-site chipping; they also employ *biomass* recovery for power generation with the vegetative debris produced by these activities.

Fortunately, there have been very few major fire events in this Planning Unit within recent decades. The A-Line Fire in 1936 was one of the last major wildfire events in this area, burning a substantial 1,628 acres in total.

Humans, vehicles, and lightning strikes are the most probable *ignition sources* here. Human-caused fire starts are more likely to occur in populated areas and recreation spots, and buildup of roadside fuels increases the likelihood of fire starts from vehicles. Downed power lines are also potential ignition sources. Much of the land in this Unit is seismically active, with the Trinidad and Big Lagoon faults located close to shore; this creates the potential for electrical fire starts that may follow any earthquakes that occur in the area.

Dead plant matter and vegetation with low *moisture levels* within 100-150 feet of homesteads pose some of the greatest threats to *structural ignitability*. Of particular concern are houses with needles and leaves accumulating on rooftops or in rain gutters. Houses with wooden rooftops and siding add to this risk, as do the presence of wooden decks, particularly those with dead plant matter accumulated beneath them. Although the high levels of humidity and precipitation within the coastal climate help prevent thorough drying-out of vegetation, it is important that communities in this area do not become complacent about the risk of wildfire. The Luffenholz Fire in 1908 covered 690 acres and managed to burn the community to the ground. *Hazardous fuel loads* in the form of brush and timber *litter* produced by logging activity can increase the potential for ignition and rapid spread of wildfires.

Some homes throughout the Unit are surrounded by steep slopes that can limit their defensible areas, put structures in the line of up-hill spreading wildfires, and limit emergency access of firefighting resources. The majority of residences in this Unit exist within the *wildland-urban interface* (WUI), where there is an increased likelihood that *structure fires* will

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[4] Madrone, S. (June 2010.) *Factors supporting an isolated stand of pinus muricata around Luffenholtz Creek, near Trinidad California.* Unpublished manuscript, Humboldt State University, California.

spread to the wildland, and vice versa. Figure IV.5-2 found at the end of this Unit Action Plan illustrates risks and hazards identified by community members at public workshops and can be used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt County Web GIS Portal, "Fire Planning" section: http://gis.co.humboldt.ca.us/.

Highway 101 is the central *ingress and egress* route, with smaller roads winding through the communities, connecting neighborhoods and residences to the main highway. Many of these smaller roads are narrow and windy, and some have sections that are un-paved and one-lane only. These types of conditions on smaller roads that lead to remote residences could create complications for emergency response vehicles trying to gain access during simultaneous home evacuations. Many routes are also grown over with vegetation and many properties have inadequate *turn around spaces*. County fire-safety standards require roads to be of a certain width to assist access during emergencies. However, one community member expressed his concerns about the potential for increased fire danger to result from the widening of county roads to meet fire-safety standards. Although widening the road improves access, this process can also open up the overstory canopy to sunlight, which can enable the encroachment of fire-prone vegetation, such as huckleberry and scotch broom. Maintaining roadside vegetation clearance is important for keeping ignition risk low and protecting the communities that depend on these roads. The potential for landslides along steep slopes in this area could also inhibit access.

The City of Trinidad's Water Department provides potable water to residents within the city limits and has 30 hydrants available for provide fire protection water.[5] The WCSD supplies drinking water to customers and maintains 11 hydrants. Residents outside of this *service area* obtain water through other means, such as drawing from nearby creeks and holding tanks. Fire protection water may also be *drafted* from the following locations:[6]

- Big Lagoon
- Two Ponds (1million gallon total; dip or draw)
- Azalea Glen Pond
- Big Lagoon Mill Pond
- Trinidad Water Tanks (300,000 gallons)

The map in Figure IV.5-2 found at the end of this Unit Action Plan illustrates these *drafting sites* as well as other community-identified wildfire *protection resources*. The map can be used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt County Web GIS Portal, "Fire Planning" section: http://gis.co.humboldt.ca.us/.

IV.5.4. Trinidad Values and Assets at Risk

Assets at risk can be defined as those things that are important to quality of life that can be threatened with destruction or loss from wildfire. These may include community assets such as homes and businesses, as well as environmental values such as wildlife habitat, natural resources, and air quality, along with any other important attribute that individual communities rely on for their well being. Loss or damage to community assets as a result of wildfire can have short- or long-term impacts of varying severity, depending on the asset. Short-term loss caused by a wildfire can include the destruction of residences, commercial assets, timber, wildlife habitat, scenic vistas, and *watersheds*. Long-term effects may include displaced persons, smaller

[5] City of Trinidad. (2012). *Water Department.* Retrieved from www.trinidad.ca.gov/departments-a-services/water.html.

[6] County of Humboldt, Natural Resources Planning. (2006, August). Appendix G: Community Identified Values, Protection Resources, Risks and Hazards, and Projects. *Humboldt County Master Fire Protection Plan.* Retrieved from http://www.co.humboldt.ca.us/natural-resources/fire_safe_council/fsc_mfpp_cwpp.aspx

timber harvests, reduced access to affected recreational areas, and destruction of cultural, ecological, and economic resources, and community infrastructure.

The majority of *assets at risk* in this Planning Unit are residential homes along with a variety of commercial and service industries, community centers, schools, fire stations, churches, as well as infrastructure components, such as water treatment facilities. The Cher-Ae Heights Casino is a noteworthy asset as well.

The map in Figure IV.5-2 found at the end of this Unit Action Plan illustrates values and assets at risk to wildfire identified by community members at public workshops. The map can be used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt County Web GIS[7] Portal, "Fire Planning" section: http://gis.co.humboldt.ca.us/. Some of the community-identified assets at risk within this Unit include:

- Big Lagoon Rancheria
- Patrick's Point State Park
- Trinidad Head, Cell Phone Towers
- Two Creeks (Municipal Watershed)
- Little Red Inn – historical site
- Westgate Community Development

Other assets include the state and county beaches within the Unit, and the expanses of timberland that dominate the region, which have significant commercial and ecological value. Several *special-status wildlife species* are present throughout this Planning Unit; they include: the southern torrent salamander, tailed frogs, the red tree vole, as well as chinook and coho salmon, and steelhead trout.[8]

IV.5.5. Trinidad Community Preparedness

No local *fire safe councils* (FSC) exist in this Planning Unit and none of the communities has achieved national *Firewise* recognition. However, during the community outreach process, the communities of Trinidad and Westhaven both expressed an interest in forming a local FSC. Given their proximity and their shared interest in this goal, there is good potential for collaboration amongst these two communities in this endeavor. Currently, efforts to educate community members about fire safety and to improve emergency preparedness within this Unit are guided by the local fire protection service providers, CAL FIRE, Humboldt County Office of Emergency Services (OES), and the Humboldt County FSC.

IV.5.6. Trinidad Wildfire Protection Capabilities

Community fire protection within the Unit is provided by the Trinidad *Volunteer Fire Department* (TVFD) and the Westhaven Volunteer Fire Department (WVFD), which provide fire protection as well as medical and rescue services to communities in the area. The TVFD has 10 volunteer and their *apparatuses* include: two type-1 engines and a rescue vehicle. The WVFD has 12 volunteers, whose apparatuses include: a 750 gallon type-1 engine, a 250 gallon type-4 attack engine, a 2,500 gallon *water tender*, and a rescue truck.[9] These VFDs are supported by donations and fundraising events within their communities. The TVFD, can be reached by calling (707) 677-0224, or by email at: tvfdchief@gmail.com; additional

[7] Geographic Information Systems (GIS).

[8] Dyett & Bhatia. (2002, September). Trinidad Watershed. *Humboldt 2025 General Plan Update: Natural Resources and Hazards; Vol. 2: Detailed Watershed Characteristics and Regulatory Framework Analysis.* (p.116.) Retrieved from http://www.co.humboldt.ca.us/gpu/documentsbackground.aspx

[9] County of Humboldt, Natural Resources Planning. (2012). *Humboldt County Fire Chiefs Association Annual Report, 2010*. Humboldt County Fire Safe Council. Retrieved from http://www.co.humboldt.ca.us/natural-resources/fire_safe_council/fireserviceannualreport.aspx

information may be found at the City of Trinidad's website at: http://www.trinidad.ca.gov/. The WVFD can be reached by calling (707) 677-0388.

Having enough water presents the biggest difficulty for providing fire protection services to the Westhaven community. A lack of water tanks within the community contributes to this complication. All the VFDs in this Unit are in need of more volunteer members, particularly people who are available during business hours, when many volunteers have responsibilities to jobs or children both of which can make it difficult to respond to emergency calls. Additional and improved firefighting equipment would also benefit these VFD stations in a meaningful way.

This Planning Unit is also home to the Trinidad CAL FIRE Station, which provides year-round fire protection services to communities within *County Service Area* #4 through an Amador agreement with the County of Humboldt. CAL FIRE has *mutual aid agreements* with volunteer fire departments in the surrounding areas. These entities may call upon each other for additional support when responding to structural or wildland fires. Even with statewide obligations during fire season, at least one fire engine is guaranteed to remain in Trinidad at all times.

IV.5.7. Trinidad Evacuation

Evacuation from the Trinidad Planning Unit will travel either north or south along Highway 101, depending on law enforcement recommendations based on *fire behavior*, wind pattern, traffic, and ingress of emergency vehicles. Several smaller roads connect residences and neighborhoods to Highway 101, and adequate ingress and egress along these roads is vital to residents that need to access the main highway *evacuation route*.

Evacuation impediments may include: landslides, fallen trees, overgrown vegetation, downed power lines, and poorly marked streets and intersections.

During wildfire events that have the potential to threaten personal safety, community evacuation sites may be established where residents can go to survive a wildfire. Evacuation sites will be established in different locations depending on the anticipated path of the wildfire. The determination for the location of these sites is normally made by Humboldt County Emergency Operations Center Incident Commander in cooperation with an *Incident Management Team*. The Humboldt County Sheriffs and Emergency Officials will use mass communication and door-to-door methods to inform residents about the threat and where residents should go to take shelter.

If a catastrophic event occurs, residents may not be able to reach designated evacuation sites. In such cases, residents may need to make decisions on their own about seeking shelter where they can survive the passage of the wildfire until they can reach an evacuation site. It can be very difficult to determine the right thing to do as the fire approaches. Before a wildfire threatens, community members should talk to their local fire department about evacuation procedures in their neighborhood.

See section V.2.3 in Part V. Fire-Safe Communities for more information on preparing for safe evacuation and evacuation planning for pets and livestock. Also see section II.3.5 Evacuation Routes and Vulnerability in Part II. Risk Assessment for information about evacuation procedures and challenges in Humboldt County.

IV.5.8. Trinidad Community Identified Potential Projects

The following list and matrix includes community identified proposed projects based on input from the community processes discussed above. A detailed description of each heading in the matrix can be found in Appendix G: Descriptive Characteristics for Community Identified Projects Matrix. These projects are illustrated on the community-identified projects map found

at the end of this Unit Action Plan (Figure IV.5-3). Projects include those carried over from the 2006 fire-planning process and those identified and refined during the 2012 CWPP update process. This information can also be viewed on the fire planning GIS Portal. The GIS Portal allows users to search for and view specific fire planning features by location or to zoom into a desired area from an aerial view. To access the Portal, go to: http://gis.co.humboldt.ca.us/ and choose "Fire Planning" from the list of mapping applications. The data collected through this Planning process are included in the GIS layers within the Portal.

No vegetation *treatments* recommended in this plan will be carried out without the consent and involvement of the property owner and all applicable local, state and federal regulations must be observed.

Non-geographic community identified proposed projects based on community workshop notes:

- Create a local fire safe council.
- Implement a community-wide mobile *Chipping Program.*
- Implement a *Big Red Truck Program*, where fire department representatives visit residents and help them identify priority areas, such as those with high fuel loads and *one-way-in, one-way-out roads*.
- Increase Hazard Awareness with public outreach and education; demonstrate good examples with local models of fire safe landscaping.
- Conduct a "boilerplate" Firewise Assessment as a public outreach tool to gauge local interest in becoming a Firewise Community.
- Install a fire hydrant at Moonstone Beach.
- Recruit more volunteers for the local fire departments.
- Create more volunteer firefighter training opportunities.

Humboldt County Community Wildfire Protection Plan

LOCATION		Treatment/Project Information Eel Fire Planning Unit							
Number Corresponds with location on map	Community, Structure, or Area (Value at Risk)	Description	Status	Year	Type	Acres	Veg Type	Maintenance (actual or proposed)	Funding source (actual or proposed)
FIE045	Community of Fieldbrook	Old Railroad Grade North Clearance	Treat-Med	2012	Roadside Clearance				grant-landowner-Assn.
ORI055	McDonald Creek Rd and Kane Ridge Rd neighborhoods	Post address signs; encourage maintaining defensible space and providing water for fire protection.	Treat-Med Action-Needed	2012	Defensible Space and Other-Education				
TRI056	Trinidad Neighborhoods	1 million gallon water tank for greater Trinidad area	Action Need	2012	Other - Water				grant-landowner-Assn.
TRI061	Trinidad Neighborhoods	Luffenholtz shaded Fuelbreak	Treat-Med	2012	Roadside Clearance	27.61			grant-landowner-Assn.
TRI065	Trinidad and Westhaven Neighborhoods	Inter-tie between Westhaven and Trinidad water systems	Action Need	2012	Other - Water				grant-landowner-Assn.
TRI066	Fox Farm Rd Community	Fox Farm Rd.: Fire safe road options for pilot project (fire safe regulations alternative)	Action Need		Roadside Clearance and Other - Access	28.70			grant-landowner-Assn.

Humboldt County Community Wildfire Protection Plan

LOCATION		Treatment/Project Information Eel Fire Planning Unit							
Number Corresponds with location on map	**Community, Structure, or Area (Value at Risk)**	**Description**	**Status**	**Year**	**Type**	**Acres**	**Veg Type**	**Maintenance (actual or proposed)**	**Funding source (actual or proposed)**
TRI067	Parcels on Fox Farm Rd. near power pole	Power pole (PG&E) fuel reduction	Treat-Med		Roadside Clearance	2.17			grant-landowner-Assn.
TRI068	Fox Farm Rd and Stumptown Rd	Alternate Access from Fox Farm Rd to Stumptown Rd - Evacuation	Action Need	2012	Other - Access				grant-landowner-Assn.

IV.5.9. Trinidad Action Plan

The following items are the initial priorities for community action for the Trinidad Planning Unit as recommended by this Humboldt County CWPP (not listed in order of priority). In an ideal world, everything recommended here would be implemented. However, it must be understood that implementation will be subject to the availability of funds and other resources and the willingness/ability of community members and Plan Partners to take action. This Action Plan can be cited in grant applications to leverage needed implementation funds and used to guide and inspire action.

Enhancing Fire Protection

- **Sustainable Fire Departments:** Community members within this Planning Unit should support their local fire departments[10] through activities such as volunteering as firefighters or auxiliary members, making donations, supporting fundraisers, writing grants, and/or helping with administrative tasks. With community support, local fire departments can continue to provide a wide variety of vital emergency services. Focus initial efforts on the following priorities:
  - Develop a recruit strategy for adding more volunteers to the local fire departments.
  - Support the efforts of the WVFD to take the necessary steps for improving its Insurance Services Office (ISO) classification. An improved ISO classification could help to reduce the fire insurance rates paid by local property owners. These improvements will also increase the level of service provided to the community.
- **Road Improvements:** Upgrade and/or repair roads that hinder access by emergency responders. Begin by systematically identifying and mitigating such access impediments. The following priority access issue was identified at a community workshop and is recommended for initial action in this plan:
  - Devise an alternative evacuation route for residents on Fox Farm Road.
- **Firefighting Water:** Increase the availability of water for fire protection by making water access locations known to fire departments and investing in more community water tanks, particularly in areas outside of the CSD boundaries. Neighborhood and road associations and/or Firewise Communities work with local fire departments to develop a *"Blue Dot" program*, which identifies the location of firefighting water sources by marking them with a blue reflective dot. This program also ensures that tanks and water systems are outfitted with fittings compatible with firefighting equipment. Begin by identifying where such a program is most needed. Focus initial efforts in the following areas:
  - Greater Trinidad community areas.
  - Westhaven neighborhoods.

Creating Fire Safe Communities

- **Firewise Communities:** Pursue participation in the Firewise Communities/USA recognition program with neighborhood groups in developed areas adjacent to the wildland, particularly where there are many residences located along dead-end roads. Use information from this Unit Action plan as a starting point for the development of a template Firewise Assessment that can be used to gain interest in the Firewise process.

[10] *All local fire departments within this unit are listed above with their contact information in the "Wildfire Protection Capabilities" section.*

Actively implement and maintain the Firewise action plan on an annual schedule. Target the following neighborhoods on edges of communities in the higher risk interface areas:

- Hammond Truck Road
- Fox Farm Road
- Skyhorse Ranch/Brindle Lane
- Ox Lane
- Driver Road
- Moonstone Cross Road
- Crannell Road

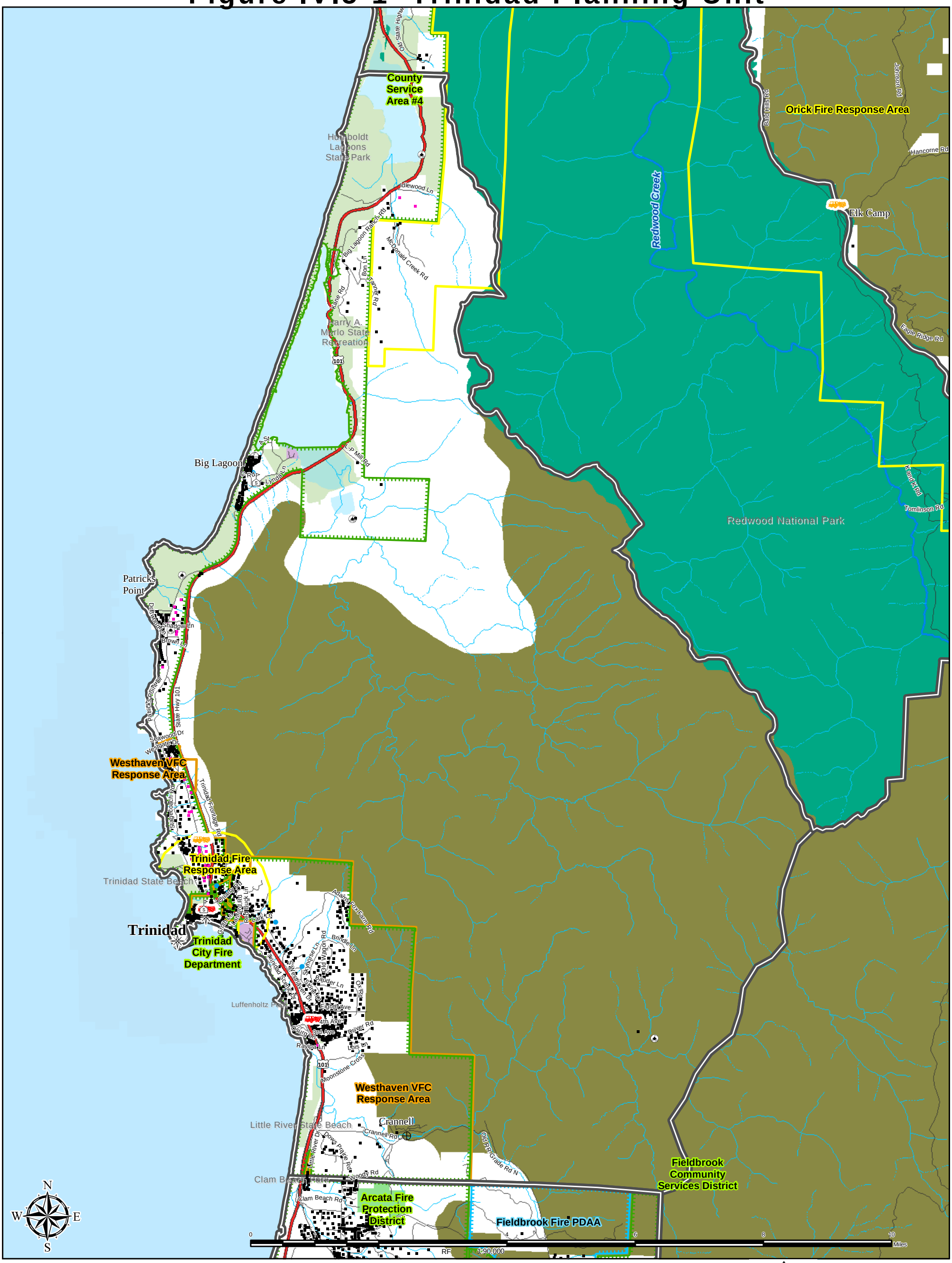
Promoting Fire Safe Education

- Conduct public education and outreach efforts regarding strategies for fire safety, maintaining defensible space, and evacuation planning. Send out informational material in mailers throughout the communities. Consider involving Boy Scouts and Girl Scouts of America in outreach efforts. Focus initial educational efforts on the following priorities:
  - Big Red Truck Program, where local firefighters visit residences and offer advice for improving fire safety on the property.
  - Increasing awareness about the risk of wildfire occurrence to inspire action. Education will help residents understand that there is a seasonal window of opportunity when the conditions are just right for sever wildfire and it only takes an ignition during that time to threaten local communities.

Reducing Wildfire Fuels (Flammable Vegetation)

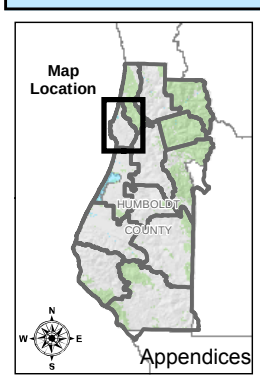
- **Defensible Space:** Those residents living in areas within this Planning Unit that are at risk to wildfire should manage the flammable vegetation within their home ignition zone. Maintaining *defensible space* through vegetation treatments should be a routine and ongoing practice for all homes and *landscapes*. Community *Chipper Days* can facilitate this process by helping landowners get rid of *slash* and brush piles so that they do not become an additional hazard. Begin by identifying where defensible space is most needed within the planning unit. The following priority areas were identified at community meetings and are recommended for treatment in this plan:
  - Neighborhoods along MacDonald Creek Road and Kane Ridge Road.
- **Roadside Clearance:** Manage roadside vegetation in order to improve and maintain access for emergency vehicles and ensure safe evacuation. Consider working with the California Conservation Corps or County Public Works Roads Division. *Shaded fuelbreaks* should be considered as a method for roadside vegetation management to inhibit the re-growth of vegetation and to promote forest health. Focus initial efforts along the following roads:
  - Old Railroad Grade North
  - Luffenholtz Lane
  - Fox Farm Road

Figure IV.5-1 Trinidad Planning Unit



CWPP Unit Map

Map Location



Legend

CWPP Planning Unit Boundary

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

Local Fire Organization Response Area
- District
- Out of District
- Non-Tax (Volunteer Fire Company (VFC))
- Proposed District Annexation Area (PDAA)

Improved Parcels
- Improved Parcel (not actual location of improvement)
- Commercial or Industrial Lot (not actual location)

Airports
- Landing Strip

Highways and Roads
- HWY 101
- State HWY
- HWY or Secondary Road
- Local Road or Street

Hydrography
- Major River or Stream

Infrastructure
- Gauging Station
- Water Tank or Source
- Historic Locations

Land Ownership

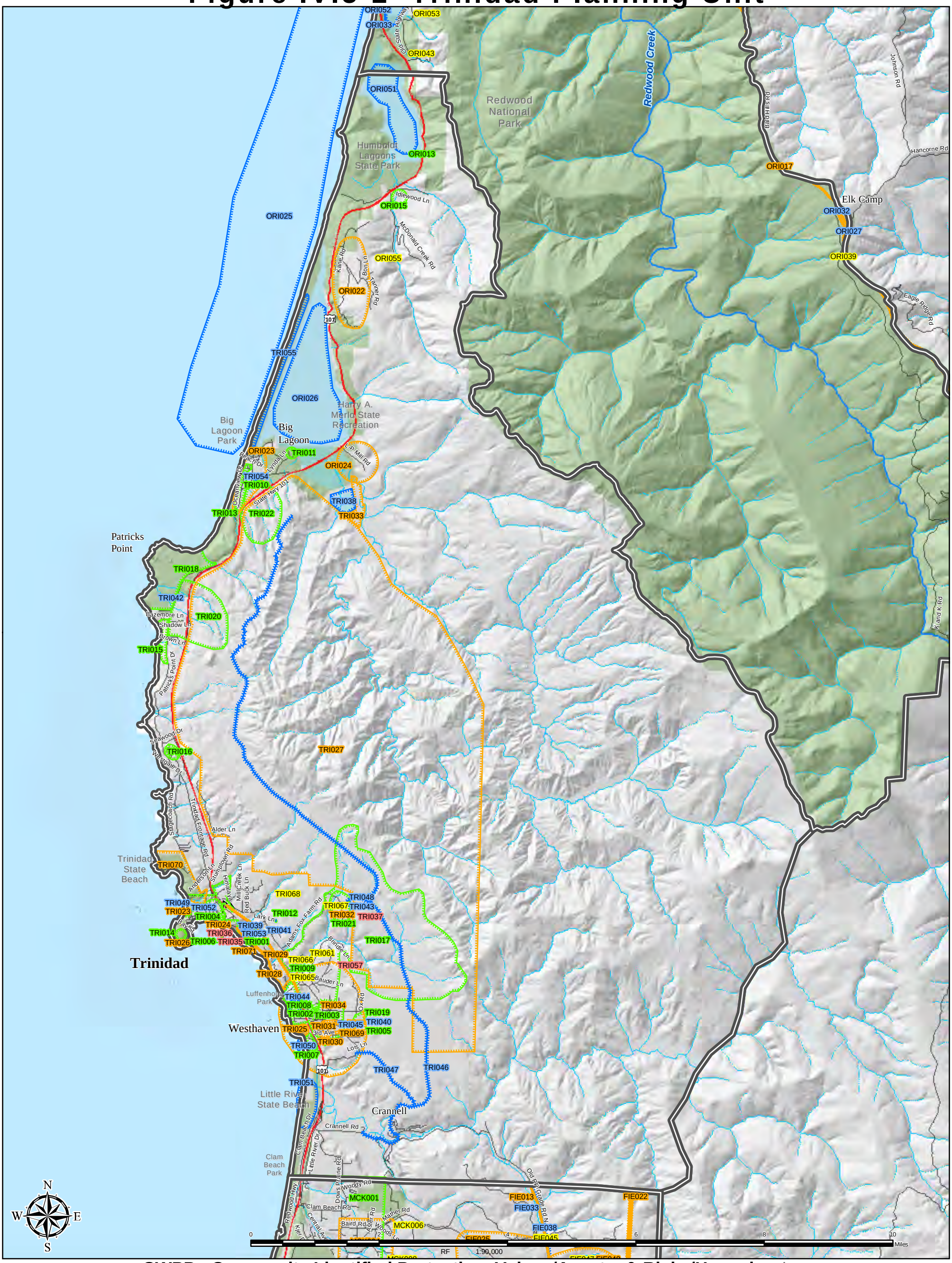
AGENCY
- Bureau of Land Management
- National Park Service
- State Park or Other State Lands
- Six Rivers National Forest
- U.S. Fish and Wildlife Service
- Tribal Lands
- Private
- Industrial Timber
- Cities

Land ownership and infrastructure data has been compiled by The County of Humboldt. Fire planning features identified at community workshops by residents; local, state, and federal fire service personnel; and Humboldt County staff. Other data sources were the 2006 Humboldt County Master Fire Protection Plan

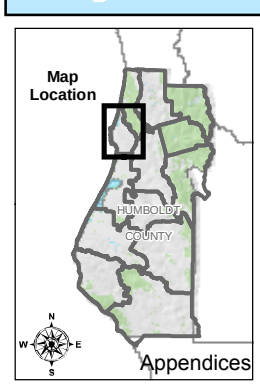
This map is intended for planning purposes and should not be used for precise measurement or navigation.

Map compiled by County of Humboldt, March 2013.
Online maps visit: http://gis.co.humboldt.ca.us
Contact: cimmit@co.humboldt.ca.us or jvondohlen@co.humboldt.ca.us

Figure IV.5-2 Trinidad Planning Unit



CWPP - Community Identified Protection, Values/Assets, & Risks/Hazards



Legend

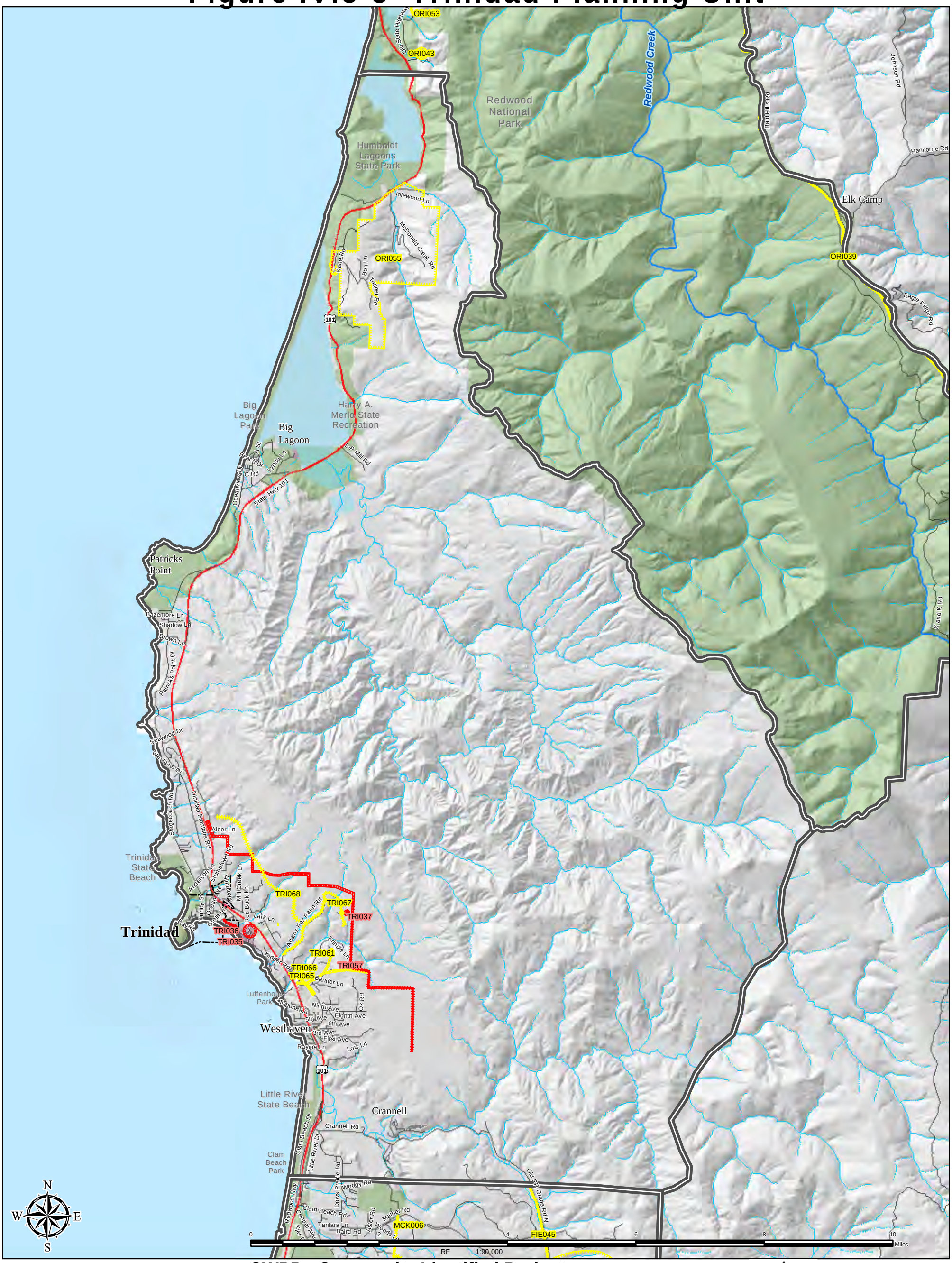
- CWPP Planning Unit Boundary
- **Community Identified Features**
  - Protection/Evacuation
  - Value/Asset
  - Risk/Hazard
- **Land Ownership**
  - Parks/Public Land
  - Cities
- **Highways and Roads**
  - HWY 101
  - State HWY
  - HWY or Secondary Road
  - Local Road or Street
- **Hydrography**
  - Major River or Stream
  - Perennial Stream
  - Intermittent Stream

Land ownership and infrastructure data has been compiled by The County of Humboldt. Fire planning features identified at community workshops by residents; local, state, and federal fire service personnel; and Humboldt County staff. Other data sources were the 2006 Humboldt County Master Fire Protection Plan

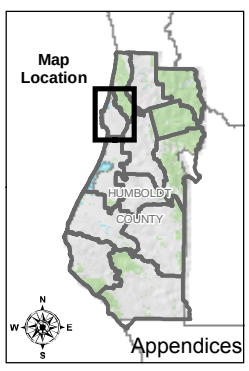
This map is intended for planning purposes and should not be used for precise measurement or navigation.

Map compiled by County of Humboldt, March 2013
Online maps visit: http://gis.co.humboldt.ca.us/
Contact: cimmit@co.humboldt.ca.us or jvondohlen@co.humboldt.ca.us

Figure IV.5-3 Trinidad Planning Unit



CWPP - Community Identified Projects



Legend

- CWPP Planning Unit Boundary
- **Community Identified Projects**
  - Proposed Project
  - Treated Project
- **Land Ownership**
  - Parks/Public Land
  - Cities
- **Highways and Roads**
  - HWY 101
  - State HWY
  - HWY or Secondary Road
  - Local Road or Street
- **Hydrography**
  - Major River or Stream
  - Perennial Stream
  - Intermittent Stream

Land ownership and infrastructure data has been compiled by The County of Humboldt. Fire planning features identified at community workshops by residents; local, state, and federal fire service personnel; and Humboldt County staff. Other data sources were the 2006 Humboldt County Master Fire Protection Plan

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Map compiled by County of Humboldt, March 2013.
Online maps visit: http://gis.co.humboldt.ca.us/
Contact: cimmit@co.humboldt.ca.us or jvondohlen@co.humboldt.ca.us

IV.6. Redwood Creek Planning Unit Action Plan

IV.6.1. Redwood Creek Planning Unit Description

The Redwood Creek *Planning Unit* encompasses 190,070 acres situated in the northern heart of Humboldt County; the Unit lies south of Redwood National Park and the Hoopa and Yurok Indian Reservations, east of Blue Lake, and west of Willow Creek. Highway 299 is the main transportation route through the area and winds across the middle of the Unit in an east-to-west direction. This Planning Unit encompasses a substantial part of the Redwood Creek *watershed*, from its headwaters to the southern Redwood National Park boundary. Redwood Creek flows across the eastern side of the Unit in a northerly direction towards Orick, where it meets the Pacific Ocean. Other major waterways include the North Fork of the Mad River in the western area, and Canon creek in the southwestern area.

This Planning Unit is sparsely populated and lacks any designated towns or cities. Three prominent neighborhood groupings are identifiable though: the Redwood Creek community, clustered in the northern portion of the Unit along Stover Road; the Titlow Hill community, which is dispersed throughout the eastern portion of the Unit on Titlow Hill Road, just south of Highway 299; and the Chezem Road community, west of Titlow Hill Rd. Numerous outlying inholdings are also scattered throughout the Unit, branching off of Highway 299 and the smaller roads throughout the southern region of the Unit, such as Bald Mountain Road and Snow Camp Road.

Private land is the dominant ownership pattern in this Planning Unit, with the majority of land owned and managed by Green Diamond Resource Company. Barnum Timber Company and Eel River Saw Mills are also industrial timber proprietors with considerable land ownership in the northern Unit area. Rural residential parcels cluster along Highway 299, particularly in the Titlow Hill Rd. area, and smatterings of inholdings exist throughout the western portion, south of Korbel as well. A few parcels of Bureau of Land Management (BLM) land lie west of the Hoopa Indian Reservation, and a small part of the southeastern Unit area includes Six Rivers National Forest territory, which is managed by the U.S. Forest Service. Primary land uses are timber and livestock production. A map of this Planning Unit can be viewed in Figure IV.6-1. Redwood Creek Unit: CWPP Unit Map.

IV.6.2. Redwood Creek Community Process Summary

A community workshop was held on May 12, 2012 at the Green Point School for the purpose of gathering local information and garnering public input regarding various factors contributing to the extent of wildfire risk and/or preparedness among the communities in this Unit, and to provide information about the countywide *community wildfire protection plan* (CWPP) update process. A luncheon fundraiser for the school followed the workshop. Approximately 20 community members were in attendance; main discussion points centered on 1) the area's lack of a local fire protection service, 2) identifying ways to improve access for emergency response vehicles, and 3) making available water sources visible for firefighters and ensuring that water sources are equipped with the proper fittings for fire engines. A group exercise, which involved maps of the Planning Unit area, invited those present to help identify and pinpoint on the map where particular *fire hazards* exist, the location of *protection resources*, such as fire water drafting sites, as well as values and *assets at risk* within the community that could be threatened by wildfire. These workshop processes also provided an opportunity for participating community members to ask questions and provide information based on their local knowledge.

Participants were also asked to review pre-existing information illustrated on the maps which had been added by community members during similar workshops that took place during the initial planning process in 2006. This workshop and mapping exercise also facilitated discussion

among community members about potential actions that could be taken to reduce fire risk in their community. Through discussion and collaborative processes, participants identified major hazard areas and compiled lists of project proposals for enhancing their community's fire preparedness.

The community-identified fire hazards, protection resources, and values and assets at risk discussed throughout the following sections of this Planning Unit Action Plan reflect information generated by these community workshop mapping exercises, as well as information resulting from direct outreach to local fire departments and residents.

The project proposals resulting from community member discussions are contained in section IV.6.8. Community-Identified Projects in this Planning Unit Action Plan.

IV.6.3. Redwood Creek Wildfire Environment

The majority (68%) of the Redwood Creek Planning Unit, particularly the eastern half, is zoned "Very High *Fire Hazard Severity*," while 38% of the Unit, including most of the western half and some of the more populated areas on the eastern side (such as Titlow Hill) are zoned "High Fire Hazard Severity," as determined by the California Department of Forestry and Fire Protection (CAL FIRE).[1] The Unit consists of mostly mountainous, forested terrain comprised of "relatively steep, unstable hillslopes, very steep inner gorge slopes along much of the mainstem, and some *tributaries*, and narrow valley bottoms,"[2] with elevations ranging from 1,100 to about 5,300 feet.

The Unit is characterized by a Mediterranean climate, with mild, wet winters and warm, dry summers. Local vegetation in the Unit is dominated by coniferous forests, containing coastal redwoods and Douglas fir, as well as several hardwood species, including bigleaf maple, red alder, tanbark oak, madrone and bay. Grassland prairies and oak woodlands are also commonly featured on south- and west-facing slopes and ridgetops.[3]

Traditionally, fire was an integral part of the *ecosystems* in this region. Forest management by indigenous tribes often included low-intensity, intentional burns that helped enhance forest ecosystems and prevent the accumulation of high *fuel loads*. Some of the early agricultural settlers in the late 1800s used intentional burning to clear and maintain grasslands for pasture animals. A heavy *fire suppression* campaign beginning in the 1930s has allowed the accumulation of dense, flammable vegetation in forest *understories*, which acts as *fuel* and increases the risk of high-intensity wildfires. Forest ecosystems, accustomed to low-intensity fires that would burn off *brush* and newer starts in the understory, become threatened by overcrowded forests and accumulated fuel. Intense timber harvests during the 20th century further exacerbated damages to forest ecosystem health.

The extent that the *landscape* has been altered as a result of fire suppression is reflected in the *condition class* of the Unit area. Condition class describes the degree of departure from the historical *natural fire regime*. Where the condition class indicates that fire has been absent for an unnaturally long time, the hazard and potential damages are high to both the environment and human developments in the area. Approximately 44% of the Redwood Creek Planning Unit is condition class 3, meaning the fire regime is significantly altered from the historical range; and approximately 25% of the area is condition class 2, or moderately altered from the historical range.

1CAL FIRE. (2007). *Fire Resources Assessment Program* (FRAP). [Map showing Fire Hazard Severity Zone ratings within various geographic areas, mapped by county]. Fire Hazard Severity Zones Map. Retrieved from http://frap.cdf.ca.gov/

2 Dyett & Bhatia. (2002, September). Redwood Creek Watershed. (p.81.)

3 Dyett & Bhatia. (2002, September). Redwood Creek Watershed. (p.82.)

Possible *ignition sources* include human-related causes, such as arson, poorly maintained campfires or brush piles, smoking, equipment use, and vehicles or vehicular accidents. Lightning and downed power lines are other potential fire starters. Other factors that are likely to have a future impact on fire risk within this Unit include: large fuel increases resulting from the spread of *Sudden Oak Death*, which has already been detected in areas of the watershed and climate change, which is likely to extend the dry season when fire risk is greatest.

All residences in this Planning Unit exist within the *wildland-urban interface* (WUI), where *wildland fires* can easily become *structural fires*, and vice versa. *Dead plant matter* and vegetation with low *moisture levels* within 100-150 feet of homesteads pose some of the greatest threats to *structural ignitability*. Of particular concern are houses with needles and leaves accumulating on rooftops or in rain gutters. Houses with wooden rooftops and sidings add to this risk, as do the presence of wooden decks, particularly those with dead plant matter accumulated beneath them. Many homes in this Unit are surrounded by steep slopes that can limit their defensible areas and put structures in the line of up-hill spreading wildfires.

Figure IV.6-2 found at the end of this Unit Action Plan illustrates risks and hazards identified by community members at public workshops and can be used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt County Web GIS Portal, "Fire Planning" section: http://gis.co.humboldt.ca.us/. Notable hazards identified by community members include:

- Long dead-end roads with only one way in and one way out.
- Slash buildup resulting from timber harvest activities adjacent to residential properties.
- Significant unpermitted constriction that is not in compliance with Humboldt County Fire Safe Regulations, particularly in Titlow Hill neighborhoods.

Highway 299 is the central *ingress and egress* route, with numerous smaller roads connecting residences and neighborhoods to it. Poor or complete lack of *signage* at roads and intersections pose potential problems for ingress and egress. Most of the residences in this Unit are remote and many are only accessible via narrow, steep, roads, some of which have no alternative exit route. The narrowness of these smaller roads leading to remote residences could create serious complications for emergency vehicle response trying to gain access during simultaneous home evacuations. Routes may also be overgrown with vegetation, and many properties have inadequate *turn around spaces*. The potential for landslides in the area could also inhibit access.

No municipal water sources service the neighborhoods within this Planning Unit. Rather, residents obtain water through other means, such as drawing from nearby creeks and holding tanks. *Fire protection water* may also be *drafted* from the following locations:

- Chezem Rd. --creek access (Chezem Flat)
- Creek Pool at bridge on Bair Rd.
- Green Diamond water hole access
- Mill Creek Bar (Green Diamond)

The map in Figure IV.6-2 found at the end of this Unit Action Plan illustrates these *drafting sites* as well as other community-identified wildfire *protection resources*. The map can be used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt County Web GIS Portal, "Fire Planning" section: http://gis.co.humboldt.ca.us/.

IV.6.4. Redwood Creek Values and Assets at Risk

Assets at risk can be defined as those things that are important to quality of life that can be threatened with destruction or loss from wildfire. These may include community assets such as homes and businesses, as well as environmental values such as wildlife habitat, natural resources, and air quality, along with any other important attribute that individual communities rely on for

their well being. Loss or damage to community assets as a result of wildfire can have short- or long-term impacts of varying severity, depending on the asset. Short-term loss caused by a wildfire can include the destruction of residences, commercial assets, timber, wildlife habitat, scenic vistas, and *watersheds*. Long-term effects may include displaced persons, smaller timber harvests, reduced access to affected recreational areas, and destruction of cultural, ecological, and economic resources, and community infrastructure.

The majority of *assets at risk* in this Planning Unit are residential homes, neighborhood areas, and ranchlands, as well as infrastructure components such as *access roads/evacuation routes* and a transfer station. Timberland resources are also valuable assets at risk to loss from wildfire. Environmentally significant assets at risk include *stands* of old growth redwoods at Stover Ranch and on BLM land. The *habitat* provided by the Redwood Creek watershed is also a significant environmental asset, which includes at least 33 species of wildlife that are identified as species of special concern (*species threatened, endangered or sensitive* to human activities), five of which are fish species.[4]

The map in Figure IV.6-2 found at the end of this Unit Action Plan illustrates values and assets at risk to wildfire identified by community members at public workshops. The map can be used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt County Web GIS[5] Portal, "Fire Planning" section: http://gis.co.humboldt.ca.us/. Some of the community-identified assets at risk within this Unit include:

- Green Point School
- Camp Anderson -- historical site
- Redwood Creek Camp/Adventist Cookson Ranch
- Chezen Flat RV Sites
- Korbel Mill – Green Diamond mill site, nursery, log deck, offices
- Barnum Ranch House "Bair House" Stage Coach Stop

IV.6.5. Redwood Creek Community Preparedness

No local *fire safe council* (FSC) exists in this Planning Unit and none of the communities has achieved national *Firewise* recognition. However, during the community outreach process the Redwood Valley community expressed interest in forming a local FSC. The Green Point Elementary Scholl does provide some emergency preparedness information to students and their families and would serve as an effective focal point for communitywide emergency preparedness efforts and activities. Currently, efforts to educate community members about fire safety within this Unit are provided by the Willow Creek and Humboldt County FSCs; these efforts have been limited thus far.

IV.6.6. Redwood Creek Wildfire Protection Capabilities

No local fire protection services exist for this Planning Unit. CAL FIRE is the entity primarily responsible for providing emergency response in this area. However, responders must travel all the way from Trinidad, which takes about 55 minutes. Additionally, these communities rely on the "*goodwill service*" of Blue Lake and Willow Creek *Volunteer Fire Departments*. Blue Lake and Willow Creek fire resources will usually respond to emergency calls outside of their

[4] Dyett & Bhatia. (2002, September). Redwood Creek Watershed. *Humboldt 2025 General Plan Update: Natural Resources and Hazards; Vol. 2: Detailed Watershed Characteristics and Regulatory Framework Analysis.*(p.82) Retrieved from http://www.co.humboldt.ca.us/gpu/documentsbackground.aspx.

[5] Geographic Information Systems (GIS).

designated districts, so long as their services are not required within their immediate districts at the time. In addition, the towns of Blue Lake and Willow Creek are far enough away from the neighborhoods within this Unit that *response times* can take as long as 30 minutes or more for emergency services to reach the incident site.

The lack of any local fire protection entity within this Planning Unit, whose communities and residences are remote and embedded within the WUI, is a high priority concern. The likely potential for lengthy response times from out-of-the-area fire protection and emergency services should be acknowledged by the communities within this Unit and a strong emphasis should be placed on proactive, preventative measures, such as maintaining *defensible space* and knowledge about which community members have experience or training in first aid and medical response.

IV.6.7. Redwood Creek Evacuation

Evacuation from the Redwood Creek Planning Unit will travel either east or west along Highway 299, depending on law enforcement recommendations based on *fire behavior*, wind pattern, traffic, and ingress of emergency vehicles. There are numerous smaller roads connecting residences and neighborhoods to Highway 299. Adequate ingress and egress along these roads is vital to the majority of the community that may need to access the main highway *evacuation route* and for firefighters who will be using the same roads to access wildfires burning in up-slope areas.

For residents located along Stover Rd, an alternative evacuation route may be accessed via Bair Rd., leading northeast toward Hoopa. Residents living along Snow Camp, Ward, and Barr Roads could access Bald Mountain Road as an alternative route, west towards Korbel. Titlow Hill residents would most likely require permission and assistance from the United States Forest Service (USFS) to utilize alternative evacuation route USFS6N08 Rd. into Six Rivers National Forest territory, with access to Highway 299 and Willow Creek.

Evacuation impediments may include: landslides, fallen trees, downed power lines, overgrown vegetation, poorly marked streets and intersections, and *one-way-in, one-way-out roads* that could inhibit evacuation and emergency response vehicles, or leave residents stranded should the roads become blocked.

During wildfire events that have the potential to threaten personal safety, community evacuation sites may be established where residents can go to survive a wildfire. Evacuation sites will be established in different locations depending on the anticipated path of the wildfire. The determination for the location of these sites is normally made by Humboldt County Emergency Operations Center Incident Commander in cooperation with an *Incident Management Team*. The Humboldt County Sheriffs and Emergency Officials will use mass communication and door-to-door methods to inform residents about the threat and where residents should go to take shelter.

If a catastrophic event occurs, residents may not be able to reach designated evacuation sites. In such cases, residents may need to make decisions on their own about seeking shelter where they can survive the passage of the wildfire until they can reach an evacuation site. It can be very difficult to determine the right thing to do as the fire approaches. Before a wildfire threatens, community members should talk to their local fire department about evacuation procedures in their neighborhood.

See section V.2.3 in Part V. Fire-Safe Communities for more information on preparing for safe evacuation and evacuation planning for pets and livestock. Also see section II.3.5 Evacuation Routes and Vulnerability in Part II. Risk Assessment for information about evacuation procedures and challenges in Humboldt County.

IV.6.8. Redwood Creek Community Identified Projects

The following list and matrix includes community identified proposed projects based on input from the community processes discussed above. A detailed description of each heading in the matrix can be found in Appendix G: Descriptive Characteristics for Community Identified Projects Matrix. These projects are illustrated on the community-identified projects map found at the end of this Unit Action Plan (Figure IV.6-3). Projects include those carried over from the 2006 fire-planning process and those identified and refined during the 2012 CWPP update process. This information can also be viewed on the fire planning GIS Portal. The GIS Portal allows users to search for and view specific fire planning features by location or to zoom into a desired area from an aerial view. To access the Portal, go to: http://gis.co.humboldt.ca.us/ and choose "Fire Planning" from the list of mapping applications. The data collected through this Planning process are included in the GIS layers within the Portal.

No vegetation *treatments* recommended in this plan will be carried out without the consent and involvement of the property owner and all applicable local, state and federal regulations must be observed.

Non-geographic community identified proposed projects based on community workshop notes:

- Start a local fire department or collaborate with Blue Lake Fire Department to expand their service area. Possibly get surplus equipment from other fire departments in the area.
- Develop a community Phone Tree list; compile a list of contacts to call in case of emergency or when help is needed from (or in) other areas. As another form of emergency communication train a few community members to use the HAM Radios that are currently housed at the school.
- Improve signage throughout the community. Make home addresses and road signs more visible and add mile markers along main roads.
- Encourage evacuation planning and talk to property owners about supplying keys to locked gates on private properties in case emergency access is needed.
- Hold a "Living on Shaky Ground" course.

Humboldt County Community Wildfire Protection Plan

LOCATION		Treatment/Project Information Eel Fire Planning Unit							
Number Corresponds with location on map	Community, Structure, or Area (Value at Risk)	Description	Status	Year	Type	Acres	Veg Type	Maintenance (actual or proposed)	Funding source (actual or proposed)
FIE042	Community of Fieldbrook	Sawdust Trail - Shaded Fuelbreak	Treat-Med		Roadside Clearance				grant-landowner-Assn.
RWV042	Bair Road	Bair Rd Bridge to Hwy 299 Shaded Fuelbreak	Treat-Med		Roadside Clearance				grant-landowner-Assn.
RWV043	Stover Rd	Stover Rd. (from school to end) Shaded Fuelbreak	Treat-Med		Roadside Clearance				grant-landowner-Assn.
RWV044	Beaver Flat @ Stover Rd	Beaver Flat brush clearing & helicopter landing zone	Treat-Med		Landscape	15.45			grant-landowner-Assn.
RWV046	Redwood Creek before Lacks Creek	Summer Dam; Redwood Creek before Lacks Creek	Action Need	2010	Other - Water				grant-landowner-Assn.
RWV047	Stover Rd. @ Beaver Flat	Water Storage @ Beaver Flat	Action Need	2010	Other - Water				grant-landowner-Assn.
RWV053									

Humboldt County Community Wildfire Protection Plan

LOCATION		Treatment/Project Information Eel Fire Planning Unit							
Number Corresponds with location on map	Community, Structure, or Area (Value at Risk)	Description	Status	Year	Type	Acres	Veg Type	Maintenance (actual or proposed)	Funding source (actual or proposed)
RWV054	Road off Hwy 299 across from Bald Mtn Rd	Shaded understory, clearing as needed	Treat-Med	2012	Roadside clearance				grant-landowner-Assn.
WCK139	Upper Redwood Valley Ranch Road Community	Understory clearing and road improvements for access along Upper Redwood Valley Ranch Rd.	Treat-Med	2010	Roadside Clearance				grant-landowner-Assn.
WCK153	Hwy 299 west	Hwy 299 fuel Reduction - WC	Treat-Med	2011	Roadside Clearance				grant-landowner-Assn.
WCK221	Old Three Creeks Rd.	Old Three Creeks Rd. Clearance - Roadside Brushing/ Shaded Fuelbreak	Treat-Med		Roadside Clearance	40.29			grant-landowner-Assn.
WCK222	Titlow Hill Neighborhood	Titlow Hill Neighborhood: Encourage landowners to make Defensible Space	Treat-High	2010	Defensible Space				grant-landowner-Assn.

IV.6.9. Redwood Creek Action Plan

The following items are the initial priorities for community action for the Redwood Creek Planning Unit as recommended by this Humboldt County CWPP (not listed in order of priority). In an ideal world, everything recommended here would be implemented. However, it must be understood that implementation will be subject to the availability of funds and other resources and the willingness/ability of community members and Plan Partners to take action. This Action Plan can be cited in grant applications to leverage needed implementation funds and used to guide and inspire action.

Enhancing Fire Protection

- **Adequate Fire Protection:** Explore potential options for providing local fire protection to the communities within this Planning Unit. Community members should join in discussions pertaining to the possible expansion of the Blue Lake Fire Protection District boundaries and advocate for the inclusion of these communities in that expansion. If that is not feasible, consider developing a local fire brigade or department.
- **Signage:** To aid emergency responders, residents and road associations should improve road and address signage throughout their communities. Make signs larger and reflective to increase visibility and install road and address signs where they are missing. Less noticeable but more sentimental address signs may remain but it is important to also post reflective signs with lettering at least three inches in height. Focus initial efforts in the following priorities:
    - Post address signs at the bottom of long driveways branching off of the main roads.
    - Install mile markers along Stover Road and Titlow Hill Road.
- **Firefighting Water:** Increase the availability of water for fire protection by making water access locations known to fire departments and investing in more community water tanks. Neighborhood and road associations and/or Firewise Communities work with nearby fire departments and CAL FIRE to develop a *"Blue Dot" program*, which identifies the location of firefighting water sources by marking them with a blue reflective dot. This program also ensures that tanks and water systems are outfitted with fittings compatible with firefighting equipment. Begin by identifying where such a program is most needed. Focus initial efforts in the following area:
    - Titlow Hill Road
    - Stover Road
    - Develop a firefighting water source on Stover Road at Beaver Flat

Creating Fire Safe Communities

- **Firewise Communities:** Pursue participation in the Firewise Communities/USA recognition program with neighborhood groups in developed areas adjacent to the wildland, particularly where there are many residences located along dead-end roads. Actively implement and maintain the Firewise action plan on an annual schedule. Focus initial efforts in the following area:
    - Stover Road residents in coordination with Green Point Elementary School
- **Community Collaboration and Communication:** Develop a Phone Tree List containing contact information for residents within the Planning Unit, as well as contacts outside of the area. This contact list can be used to spread and share information throughout the community and request help in emergency situations.

- **Fire Safe Regulation Compliance:** Property owners should coordinate with the Humboldt County Planning and Building Department to achieve compliance with County codes and regulations.

Preparing Communities for Emergencies

- **Community Emergency Response Teams:** Organize a *Community Emergency Response Teams* (CERT) training session for residents interested in improving the community's emergency preparedness. These training opportunities equip community members with basic disaster response skills for dealing with a variety of emergency situations. Such skills become extremely valuable in situations where professional responders cannot act immediately. CERT participants gain experience implementing collaborative problem solving and develop a greater sense of community cohesion.

Promoting Fire Safe Education

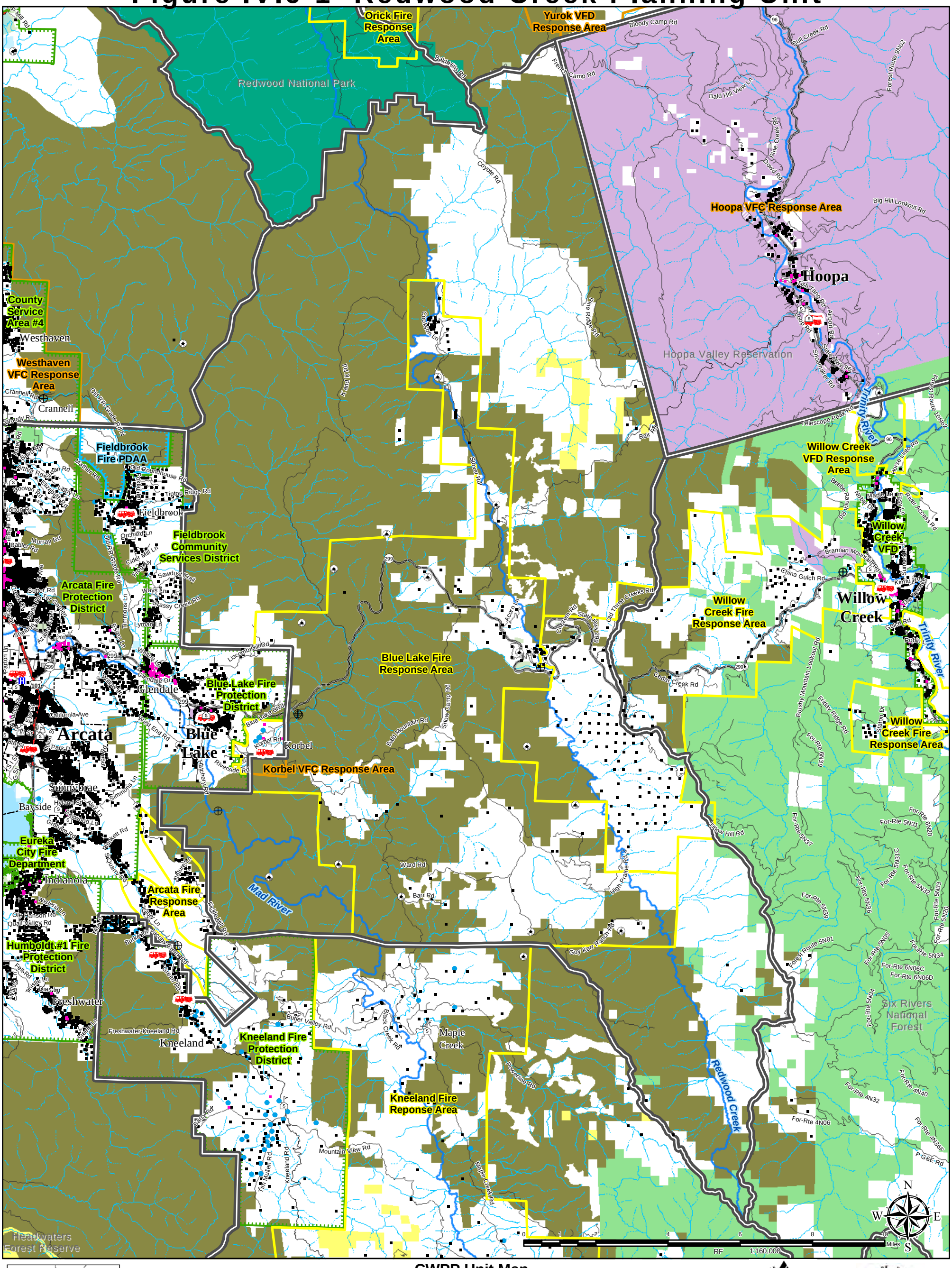
- Conduct public education and outreach efforts regarding strategies for fire safety, maintaining defensible space, and evacuation planning. Send out informational material in mailers throughout the communities. Consider involving Boy Scouts and Girl Scouts of America in outreach efforts. Focus initial educational efforts on the following priority:
  - Evacuation Preparedness
  - Reducing hazards in the *Home Ignition Zone*
  - Effective communication while calling 911; particularly in relation to explaining the incident location.

Reducing Wildfire Fuels (Flammable Vegetation)

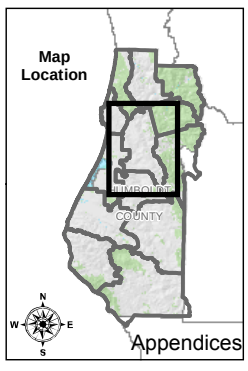
- **Defensible Space:** Those residents living in areas within this Planning Unit that are at risk to wildfire should manage the flammable vegetation within their Home Ignition Zone. Maintaining *defensible space* through vegetation treatments should be a routine and ongoing practice for all homes and landscapes. Community *Chipper Days* can facilitate this process by helping landowners get rid of slash and brush piles so that they do not become an additional hazard. Begin by identifying where defensible space is most needed within the planning unit. The following priority areas were identified at community meetings and are recommended for treatment in this plan:
  - Neighborhoods along Titlow Hill Road.
  - Neighborhoods along Stover Road
- **Roadside Clearance:** Manage roadside vegetation in order to improve and maintain access for emergency vehicles and ensure safe evacuation. Consider working with the California Conservation Corps or County Public Works Roads Division. Focus initial efforts along the following roads:
  - Sawdust Trail
  - Bair Road, bridge to Highway 299
  - Stover Road
  - Upper Redwood Valley Ranch Road
  - Old Tree Creeks Road
- **Landscape Fuels Reduction:** Construct *shaded fuelbreaks* as buffers between residential areas and wildlands to slow the progress of wildfires. This allows firefighters a higher probability of successfully protecting communities from wildfire damage. These buffers may also protect the wildlands from the spread of fires originating within communities. The following areas are recommended for priority treatment in this plan:
  - Brush clearing and creation of a helicopter landing area on Stover Road at Beaver Flat.

- Create a buffer between Green Diamond and Barnum Timber lands and adjacent residential properties to protect both the community and the resource lands.

Figure IV.6-1 Redwood Creek Planning Unit



CWPP Unit Map



Legend

- CWPP Planning Unit Boundary

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

Local Fire Organization Response Area
- District
- Out of District
- Non-Tax (Volunteer Fire Company (VFC))
- Proposed District Annexation Area (PDAA)

Improved Parcels
- Improved Parcel (not actual location of improvement)
- Commercial or Industrial Lot (not actual location)

Airports
- Landing Strip

Highways and Roads
- HWY 101
- State HWY
- HWY or Secondary Road
- Local Road or Street

Hydrography
- Major River or Stream

Infrastructure
- Gauging Station
- Water Tank or Source
- Historic Locations

Land Ownership

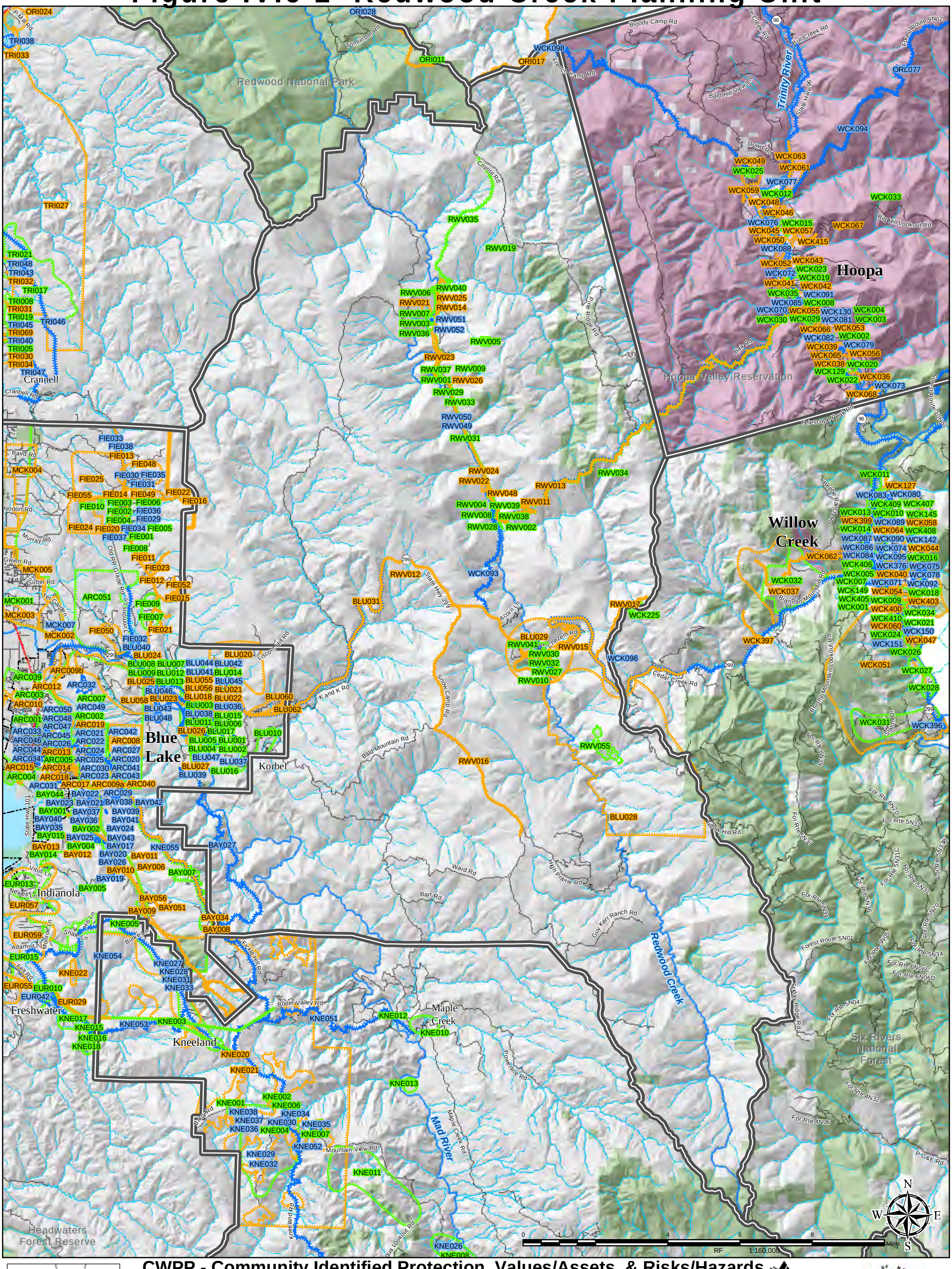
AGENCY
- Bureau of Land Management
- National Park Service
- State Park or Other State Lands
- Six Rivers National Forest
- U.S. Fish and Wildlife Service
- Tribal Lands
- Private
- Industrial Timber
- Cities

Land ownership and infrastructure data has been compiled by The County of Humboldt. Fire planning features identified at community workshops by residents; local, state, and federal fire service personnel; and Humboldt County staff. Other data sources were the 2006 Humboldt County Master Fire Protection Plan

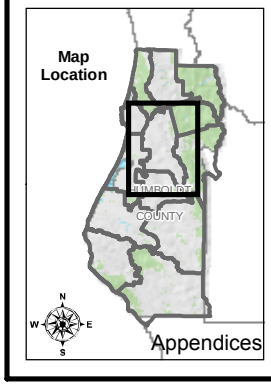
This map is intended for planning purposes and should not be used for precise measurement or navigation.

Map compiled by County of Humboldt, March 2013.
Online maps visit: http://gis.co.humboldt.ca.us/
Contact: cimmit@co.humboldt.ca.us or jvondohlen@co.humboldt.ca.us

Figure IV.6-2 Redwood Creek Planning Unit



CWPP - Community Identified Protection, Values/Assets, & Risks/Hazards



Legend

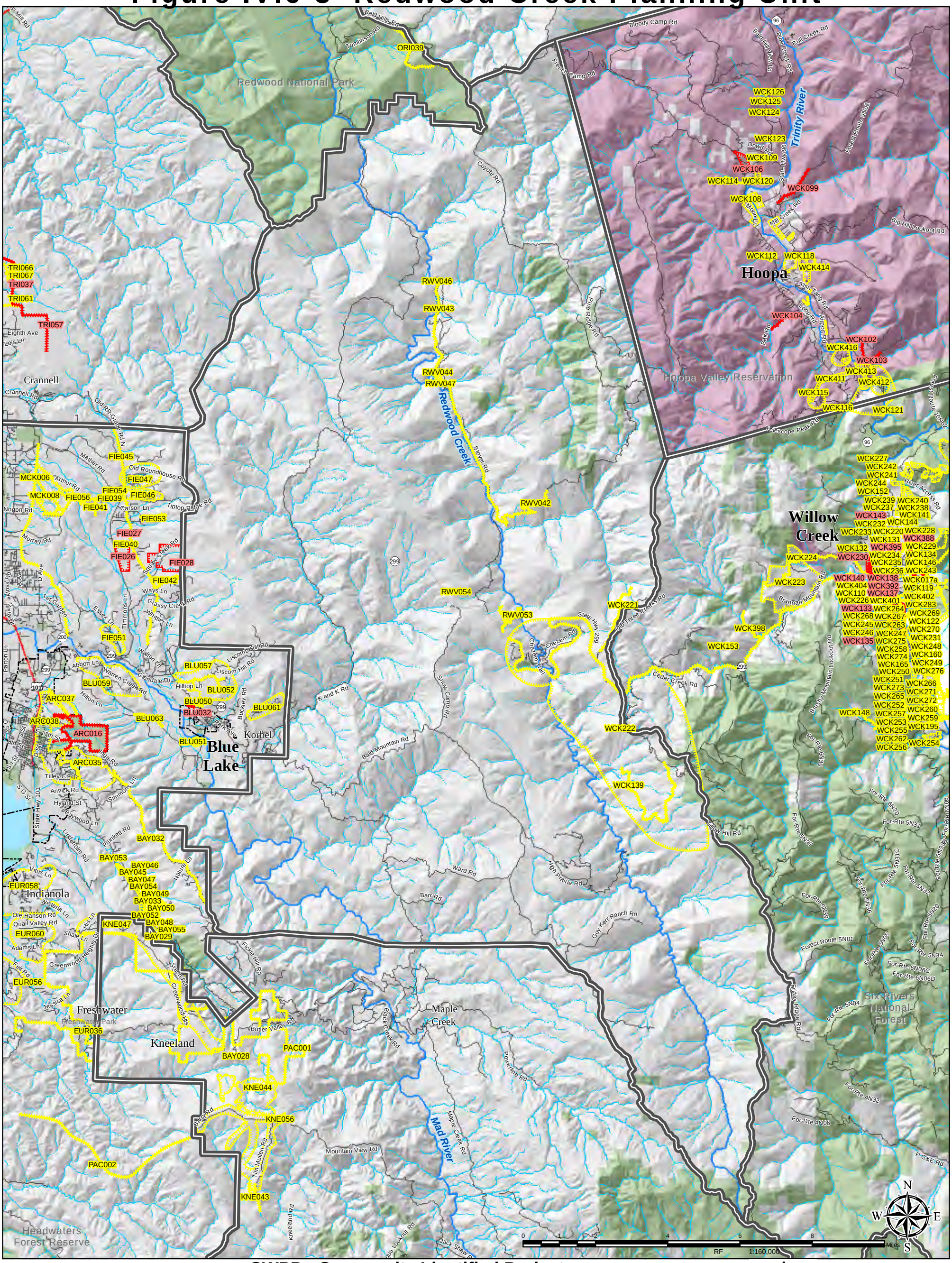
- CWPP Planning Unit Boundary
- **Community Identified Features**
  - Protection/Evacuation
  - Value/Asset
  - Risk/Hazard
- **Land Ownership**
  - Parks/Public Land
  - Reservation/Tribal Land
  - Cities
- **Highways and Roads**
  - HWY 101
  - State HWY
  - HWY or Secondary Road
  - Local Road or Street
- **Hydrography**
  - Major River or Stream
  - Perennial Stream
  - Intermittent Stream

Land ownership and infrastructure data has been compiled by The County of Humboldt. Fire planning features identified at community workshops by residents; local, state, and federal fire service personnel; and Humboldt County staff. Other data sources were the 2006 Humboldt County Master Fire Protection Plan

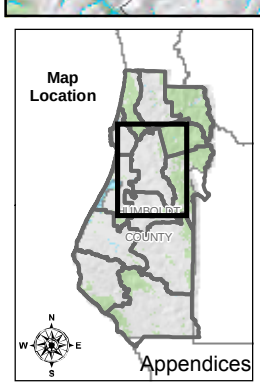
This map is intended for planning purposes and should not be used for precise measurement or navigation.

Map compiled by County of Humboldt, March 2013,
Online maps visit: http://gis.humboldt.ca.us
Contact: cimmit@co.humboldt.ca.us or jvondohlen@co.humboldt.ca.us

Figure IV.6-3 Redwood Creek Planning Unit



CWPP - Community Identified Projects



Legend

- CWPP Planning Unit Boundary
- **Community Identified Projects**
  - Proposed Project
  - Treated Project
- **Land Ownership**
  - Parks/Public Land
  - Reservation/Tribal Land
  - Cities
- **Highways and Roads**
  - HWY 101
  - State HWY
  - HWY or Secondary Road
  - Local Road or Street
- **Hydrography**
  - Major River or Stream
  - Perennial Stream
  - Intermittent Stream

Land ownership and infrastructure data has been compiled by The County of Humboldt. Fire planning features identified at community workshops by residents; local, state, and federal fire service personnel; and Humboldt County staff. Other data sources were the 2006 Humboldt County Master Fire Protection Plan

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Map compiled by County of Humboldt, March 2013.
Online maps visit: http://gis.co.humboldt.ca.us/
Contact: cimmit@co.humboldt.ca.us or jvondohlen@co.humboldt.ca.us

IV.7. Trinity Planning Unit Action Plan

IV.7.1. Trinity Planning Unit Description

The Trinity *Planning Unit* encompasses 168,362 acres situated in eastern Humboldt County within the south-central Klamath Mountains, bordering Trinity County. The boundaries of this Planning Unit were partly determined by the area described in the Willow Creek Greater Area *Community Wildfire Protection Plan* (CWPP), which includes communities located in Trinity County. Thus, the southeastern quadrant of this Planning Unit actually falls within the boundaries of Trinity County; however, the recommended action items described in this Unit Action Plan will focus on those items pertinent to Humboldt County, specifically. The two main transportation routes are Highway 299, which leads southeast towards Weaverville or west towards Arcata, and Highway 96, which follows the Trinity River north into Hoopa. These primary roads intersect in the central town of Willow Creek, about 35 miles from the Pacific coast. Part of the Trinity River *watershed*, the Unit is made up of mostly steep and mountainous terrain with deep valleys formed by the Trinity River and its *tributaries* dissecting the area. "The New River, the South Fork of the Trinity, and Willow Creek all confluence with the main stem of the Trinity along with numerous streams, creeks, and unnamed water courses."[1] Elevations in this unit range from 440 to 9,025 feet above sea level.

Willow Creek comprises both the geographic center as well as the central community of this Unit. Several neighborhoods exist in the area surrounding Willow Creek; among them are the neighborhoods of: Bigfoot, Clover Flat, Hodgson, Kimtu, Knights, McIntosh, Riteway Lane, Rowley, Terrace, and The Farms.[2] The majority of communities in this Planning Unit exist along Highway 299, including: Salyer, Hawkins Bar, Burnt Ranch and Cedar Flat, as well as the neighborhoods of Oden Flat, Gray Flat, and Suzy Q. All of these are identified *communities at risk* of wildfire,[3] where homes are located within the *wildland-urban interface* (WUI). Although the majority of the population has access to phone and electrical services, there is limited cellular phone reception and many residents live "off-the-grid."[4]

The majority of this Planning Unit falls within Six Rivers National Forest boundaries and is managed by the U.S. Forest Service (USFS). The distribution of private and public lands within this Unit is somewhat like a checkerboard, with private in-holdings interspersed throughout Forest Service land. A large portion of private land in this Unit is owned by timber industries. Other private ownerships include residential parcels as well as ranchlands. The area also supports a few small produce and specialty farms, as well as some local vineyards. Dominant land uses include recreation, timber, fisheries, wildlife *habitat*, and grazing. A map of this planning unit can be viewed in Figure IV.7-1. Trinity Unit: CWPP Unit Map.

IV.7.2. Trinity Community Process Summary

A community workshop was held on May 24, 2012 at the Trinity Valley Elementary School in Willow Creek for the purpose of gathering local information and garnering public input regarding various factors contributing to the extent of wildfire risk and/or preparedness among the

[1] Willow Creek Fire Safe Council. (2011). *Willow Creek Greater Area Community Wildfire Protection Plan (CWPP)*. (p.6.) Retrieved from http://willowcreekfsc.org/cwpp.html.

[2] County of Humboldt, Natural Resources Planning. (2006, August). Appendix G: Community Identified Values, Protection Resources, Risks and Hazards, and Projects. (p.G-7.) *Humboldt County Master Fire Protection Plan.* Retrieved from http://www.co.humboldt.ca.us/natural-resources/fire_safe_council/fsc_mfpp_cwpp.aspx

[3] California Fire Alliance. (2012). *Communities at Risk List* Retrieved from www.cafirealliance.org/communities_at_risk/communities_at_risk_list.

[4] Willow Creek Fire Safe Council. (2011). *Willow Creek Greater Area CWPP*. (p. 6.)

communities in this Unit, and to provide information about the countywide community wildfire protection plan (CWPP) update process. Attendees included members of the local volunteer fire department (VFD), several members of the Willow Creek Fire Safe Council, USFS, and California Department of Forestry and Fire Protection (CAL FIRE) representatives, as well as the Grange Master of the district. A group exercise, which involved maps of the Planning Unit area, invited those present to help identify and pinpoint on the map where particular *fire hazards* exist, the location of *protection resources*, such as fire water drafting sites, as well as values and *assets at risk* within the community that could be threatened by wildfire. These workshop processes also provided an opportunity for participating community members to ask questions and provide information based on their local knowledge.

Participants were also asked to review pre-existing information illustrated on the maps which had been added by community members during similar workshops that took place during the initial planning process in 2006. This workshop and mapping exercise also facilitated discussion among community members about potential actions that could be taken to reduce fire risk in their community. Through discussion and collaborative processes, participants identified major hazard areas and compiled lists of project proposals for enhancing their community's fire preparedness.

The community-identified fire hazards, protection resources, and values and assets at risk discussed throughout the following sections of this Planning Unit Action Plan reflect information generated by these community workshop mapping exercises, as well as information resulting from direct outreach to local fire departments and residents.

The project proposals resulting from community member discussions are contained in section IV.7.8. Community-Identified Projects in this Planning Unit Action Plan.

IV.7.3. Trinity Wildfire Environment:

Nearly the entire Trinity Planning Unit (97%) is zoned "Very High *Fire Hazard Severity*," as determined by CAL FIRE,[5] although fire risk tends to be slightly lower in the flatter and less vegetated areas. The mountainous terrain and steep river canyons that are characteristic of this region, combined with long, hot summers that generate *fuels* with low *moisture levels* can amplify the rate that fires spread and their level of intensity. The Trinity County Board of Supervisors has expressed concern about these issues and notes that, "exorbitant amounts of money are spent each year fighting fires."[6]

Local *vegetation types* include mixed evergreen, *conifer forests*, Klamath mixed conifer forests, and White Oak forests. Riparian areas are dominated by grasslands and hardwoods such as oak, alder, and willow.[7]

Traditionally, fire was an integral part of the *ecosystems* in this region. Forest management by indigenous tribes often included low-intensity, intentional burns that helped enhance forest ecosystems and prevent the accumulation of high *fuel loads*. Some of the early agricultural settlers in the late 1800s used intentional burning to clear and maintain grasslands for pasture animals. A heavy *fire suppression* campaign beginning in the 1940s has allowed the accumulation of dense, flammable vegetation in forest *understories*, which acts as *fuel* and increases the risk of high-intensity wildfires. Forest ecosystems, accustomed to low-intensity fires that would burn off *brush* and newer starts in the understory, become threatened by overcrowded forests and accumulated fuel. This change from the natural *fire regime* has also altered *vegetation*

[5]CAL FIRE. (2007). *Fire Resources Assessment Program (FRAP).* [Map showing Fire Hazard Severity Zone ratings within various geographic areas, mapped by county]. Fire Hazard Severity Zones Map. Retrieved from http://frap.cdf.ca.gov/

[6] Trinity County Board of Supervisors. (2008, February 5). Resolution No. 2008-006 Declaring a state of emergency related to the extreme wildfire risk in Trinity County. In: Willow Creek Fire Safe Council. (2011). *Willow Creek Greater Area CWPP*.

[7] Willow Creek Fire Safe Council. (2011). *Willow Creek Greater Area CWPP*. (p. 8.)

composition and the ecological structure of forests in these areas, such that the majority of ecosystems in this area are "out-of-whack" and susceptible to losing key ecosystem components.[8] Intense timber harvests during the 20th century have further exacerbated damages to forest ecosystem health. The extent that the *landscape* has been altered as a result of fire suppression is reflected in the *condition class* of the Unit area. Condition class describes the degree of departure from the historical *natural fire regime*. Where the condition class indicates that fire has been absent for an unnaturally long time, the hazard and potential damages are high to both the environment and human developments in the area. Approximately 56% of the Trinity Planning Unit is condition class 3, meaning the fire regime is significantly altered from the historical range; and approximately 32% of the area is condition class 2, or moderately altered from the historical range.

The Fire History Map within the Willow Creek Greater Area CWPP shows some of the more widespread fires. Although several of these fires burned in the Shasta-Trinity National Forest (NF) area, outside of Humboldt County, the proximity of these fires was near enough for the communities within this Planning Unit to experience their impacts, particularly in the form of degraded air quality. Fires in and adjacent to this Planning Unit include[9]:

- The Megram Fire, in 1999: 57,727 acres
- The Onion Fire in 1999: 15,949 acres (Shasta-Trinity NF)
- The Friday Fire in 2003: 389 acres
- The Half Fire in 2008: 9,095 acres
- The Ziegler Fire, in 2008: 2,349 acres (Shasta-Trinity NF--part of the Iron Complex)
- The Ironside Fire in 2008:12,720 acres (Shasta-Trinity NF--part of the Iron Complex)
- The Cedar Fire in 2008: 25,398 acres (Shasta-Trinity National Forest--part of the Iron Complex)

Humans have been the primary cause of fires in the last 50 years. Most fires have occurred along main road systems, down in the river valley, and near residences and recreation areas. Lightning strikes are another cause of fire, but they are spread more evenly throughout the Unit, often occurring at higher elevations and in remote locations. Numerous wildfires may be generated from multiple strikes within the same lightning storm, which can put a strain on firefighting resources. Vehicles are also a potential *ignition source*, with higher risks resulting from roadside fuels built up along town streets, back roads, and highways. Recreation operations draw in an increased population during the summer months, which can create a higher ignition risk as well. Additional ignition risks include: unattended campfires, *structure fires* spreading into the *wildlands*, arson, and power lines.[10]

The risk of *structural ignitability* is exacerbated in many cases by wooden roofs and sidings, which are common to houses in this area. This risk is greatly increased by the accumulation of leaves, needles and small dead branches on rooftops and in gutters. It has been observed that many homes in the planning area have dense vegetation growing in the *Home Ignition Zone*. Additionally, homes with woodpiles, fences, gates and wood lattice in contact with the structure are susceptible to combustion and, if lighted, could ignite the home as well. Figure IV.7-2 found at the end of this Unit Action Plan illustrates risks and hazards identified by community members at public workshops and can be used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt County Web GIS Portal, “Fire Planning” section: http://gis.co.humboldt.ca.us/.

[8] Willow Creek Fire Safe Council. (2011). *Willow Creek Greater Area CWPP*. (p. 9.)
[9] Willow Creek Fire Safe Council. (2011). *Willow Creek Greater Area CWPP*. (p. 14.)
[10] Willow Creek Fire Safe Council. (2011). *Willow Creek Greater Area CWPP*. (p. 2.)

Topographical features of the Unit such as narrowed winding roads, and hilly terrain create potential problems for orderly evacuation and delivery of emergency services. The terrain also poses problems for water delivery in fire protection. Many private roads originating off of Highways 299 and 96 serve back woods residences but do not provide a secondary emergency *evacuation route*. This problem of *one-way-in-one-way-out roads* is prevalent throughout the Unit and poses a serious potential risk to firefighter access, particularly if home evacuations are occurring simultaneously. One prominent example is the bridge on Country Club Road, which serves as the only way for residents of the Bigfoot Subdivision, Seely McIntosh, Patterson Road, and Oak Lane neighborhoods to get across the river to Highways 299 and 96. These neighborhoods are otherwise surrounded by the steep, dense forests of Six Rivers National Forest.[11]

The Willow Creek *Community Service District*, which was formed in 1967, provides water to about 2,000 customers with 935 service connections. The District's critical facilities include a water treatment plant, pump stations, and six water tanks, three of them redwood and three metal, with a storage capacity of 1.2 million gallons.[12] Water for fire protection may also be drawn from the following locations: [13]

- Big Rock - USFS river access
- Bigfoot golf course (drafting)
- Kimtu Beach - drafting area
- Burnt Ranch Mill water intake
- Hennessey Creek
- Skycrest Lake (on private property)

The map in Figure IV.7-2 found at the end of this Unit Action Plan illustrates these *drafting sites* as well as other community-identified wildfire *protection resources*. The map can be used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt County Web GIS Portal, "Fire Planning" section: http://gis.co.humboldt.ca.us/.

IV.7.4. Trinity Values and Assets at Risk

Assets at risk can be defined as those things that are important to quality of life that can be threatened with destruction or loss from wildfire. These may include community assets such as homes and businesses, as well as environmental values such as wildlife habitat, natural resources, and air quality, along with any other important attribute that individual communities rely on for their well being. Loss or damage to community assets as a result of wildfire can have short- or long-term impacts of varying severity, depending on the asset. Short-term loss caused by a wildfire can include the destruction of residences, commercial assets, timber, wildlife habitat, scenic vistas, and *watersheds*. Long-term effects may include displaced persons, smaller timber harvests, reduced access to affected recreational areas, and destruction of cultural, ecological, and economic resources, and community infrastructure.

The majority of *assets at risk* in this Planning Unit are residential homes and communities, along with a variety of commercial and service industries, community centers, medical and dental clinics, schools, churches, fire stations, as well as infrastructure components such as a water treatment facility. Several small organic farms and local wineries within this Unit are also considered assets at risk.

The map in Figure IV.7-2 found at the end of this Unit Action Plan illustrates values and assets at risk to wildfire identified by community members at public workshops. The map can be

[11] Willow Creek Fire Safe Council. (2011). *Willow Creek Greater Area CWPP*. (p. 13.)

[12] County of Humboldt, Natural Resources Planning. (2008). *Humboldt Operational Area Hazard Mitigation Plan; Volume 2 – Planning Partner Annexes.* (p.14-2.) Retrieved from http://www.co.humboldt.ca.us/natural-resources/hazardmitigation/?inc=finaldraft

[13] Willow Creek Fire Safe Council. (2011). Appendix 1: Matrix of Community Identified Features and Maps. *Willow Creek Greater Area CWPP*.

used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt County Web GIS[14] Portal, "Fire Planning" section: http://gis.co.humboldt.ca.us/. Some of the community-identified assets at risk within this Unit include:

- Burnt Ranch Veterans Hall- Indian Hall
- Knights neighborhood/Trailer Park
- Burnt Ranch Campsite – Burnt Ranch Falls USFS
- Commercial District - US Post Office
- Willow Creek repeater
- Cell Tower

Natural resource assets such as waterways, forests, fisheries and wildlife are highly valued by residents in these communities. These assets contribute positively to local quality of life and to the tourist-related economy as well. Many culturally sensitive sites of special importance to Native Americans exist throughout the Unit as well.[15]

IV.7.5. Trinity Community Preparedness

Three distinct *fire safe councils* (FSCs)--the Willow Creek Fire Safe Council (WCFSC), Humboldt County FSC, and Trinity County FSC-- support communities in this Unit by providing fire preparedness education and programs to residents. These FSCs also compete for grants to help fund *fire hazard* mitigation efforts within the area, such as *fuel reduction* projects.

The mission of the WCFSC is: "to reduce wildfire risk and increase survivability by implementing fuels reduction projects and encouraging residents of the Willow Creek area to make their homes, neighborhoods, and communities *fire safe*."[16] The WCFSC is very active and has secured grant funding to put on an annual Fire Safe Day and Youth Ecology Fair. Also with grant money, the WCFSC has held *Chipper Days* in order to help landowners get rid of brush, and they have implemented the *"Blue Dot Program,"* which makes water sources available for fire protection more apparent to firefighters. In addition to constructing their own website through which community members can access fire safety information, the WCFSC has produced a "Living With Fire" publication. The WCFSC works in coordination with the Willow Creek Volunteer Fire Department (WCVFD) to provide community education, and with CAL FIRE to conduct a Fire Prevention program.

The WCFSC also had a prominent role in developing the Willow Creek Greater Area CWPP, which was completed in 2011. It encompasses the communities of Willow Creek, Salyer, Hawkins Bar, Burnt Ranch, and Cedar Flat. Some of the main objectives of the plan are: to improve the protection of lives and properties from wildfire; merge the goals of landowners with community needs regarding *wildfire risk* reduction; coordinate fire protection strategies across property boundaries; and provide a tool to help coordinate grant funding for such efforts. The plan is also aimed at increasing public awareness of good fire safety practices for living in the WUI and providing residents with resources to help them reduce fire risk on their own properties.[17]

The WCFSC can be contacted by calling (707) 499-0767, by email at: admin@willowcreekfsc.org, or by visiting their website at: www.willowcreekfsc.org.

The community of Willow Creek has also all received national recognition as a *Firewise* community. Some successful Firewise modifications include: *hazardous vegetation management* around homes, roads, parks, and businesses; eliminating *ladder fuels* in the home ignition zone;

[14] Geographic Information Systems (GIS).

[15] Willow Creek Fire Safe Council. (2011). *Willow Creek Greater Area CWPP*. (pp. 18-19).

[16] Willow Creek Fire Safe Council. (n.d.) Our Mission. *Willow Creek Fire Safe Council Homepage.* Retrieved November 28, 2012 from www.willowcreekfsc.org.

[17] Willow Creek Fire Safe Council. (2011). *Willow Creek Greater Area CWPP*. (p. 1.)

creating well positioned, reflective address and road signs; implementing fire safe landscaping (such as stone and gravel pathways that can act as *fuelbreaks*) around homes in the community; and obtaining funding assistance for property owners making these modifications via the F*ire-adapted Landscapes and Safe Homes (FLASH) program*.[18]

FLASH is a rebate program that reimburses property owners for hazardous vegetation management completed around their homes, along *access routes*, and in particularly hazardous areas. Between 2010 and 2011, over 35 acres were treated under the FLASH program and over 100 site visits including a home risk assessment were conducted by FSC staff. The program has received additional funding for 2012-2013 and the goal is to treat approximately 20 acres.

IV.7.6. Trinity Fire Protection Level of Service

The Trinity Planning Unit has excellent coordination and collaboration between various fire protection groups. Federal, state, and local agencies have a cooperative agreement for exchanged protection responsibility in specific areas; for example, CAL FIRE provides both 911 *dispatching* services to the Willow Creek VFD, as well as suppression resources to the Six Rivers National Forest when requested. "Because fires do not respect jurisdictional boundaries and in the spirit of shared protection responsibility, local, state, and federal resources work together to ensure a well coordinated wildfire management strategy."[19] However, CAL FIRE's capabilities and resources are limited outside of fire season due to units being unstaffed as a result of state budget cuts.

Local *volunteer fire departments* (VFDs) are primarily responsible for responding to *structural fires* and medical emergencies; however, volunteers are also trained for wildfire management and may be called upon to assist in case of fire emergencies. The following VFD provides fire protection as well as medical and rescue services to the neighborhoods within this Planning Unit:[20]

- The Willow Creek VFD, founded in 1957, has 22 volunteers who provide service to approximately 2,000 residents within an area of four square miles. Their *apparatuses* include: two type-2 engines, a type-6 wildland engine, one rescue truck, and a 3,000 gallon *water tender*. The Willow Creek VFD can be reached by calling (530) 629-2229.

The following departments are in Trinity County but will respond to emergencies in Willow Creek and also receive assistance from the WCVFD as needed:

- The Hawkins Bar VFD has 12 volunteers who provide service to 600 residents within approximately 156 square miles. Their apparatuses include: four fire engines, including one quick attack engine, a medical van, and a water tender. The Hawkins Bar VFD can be reached by calling (530) 629-3920.
- The Salyer VFD has approximately 14 volunteers who provide service within approximately 50 square miles. Their apparatuses include: two type-2 engines, one quick attack medical vehicle, and one water tender. The Salyer VFD can be reached by calling (530) 629-2778.

Sufficient funding is a critical issue faced by many VFDs in this area. Costs associated with insurance, Workers Compensation, and ensuring adequate safety equipment and training are high; and fund-raising by all-volunteer departments is difficult and time-consuming. Providing emergency response to calls during business hours can be a challenge for many VFD, as volunteers often have jobs or children to attend to during the day. Still, VFDs are holding fast to

[18] Firewise Communities/USA Recognition Program. (2010). *Willow Creek Community Firewise Assessment*.

[19] Willow Creek Fire Safe Council. (2011). *Willow Creek Greater Area CWPP*. (p. 20.)

[20] Willow Creek Fire Safe Council. (2011). *Willow Creek Greater Area CWPP*. (pp. 23-25.)

ensure delivery of local emergency services, although the level of service capabilities vary between communities.

IV.7.7. Trinity Evacuation

Evacuation from the Trinity Planning Unit will travel either south-east or west along Highway 299 or north on Highway 96, depending on law enforcement recommendations based on *fire behavior*, wind pattern, traffic, and ingress of emergency vehicles. There are numerous smaller roads connecting residences and neighborhoods to Highway 96. Adequate ingress and egress along these roads is vital to a large portion of the community that may need access to the main highway evacuation route and for firefighters who will be using the roads to access wildfires burning in these areas.

Several U.S. Forest Service Routes could potentially provide alternative evacuation routes; however, residents would most likely require permission and assistance to utilize these routes.

Potential alternative evacuation routes include:

- Campbell Ridge Rd., Brannan Mountain Rd., Beebe Ranch Rd., Coon Creek Rd., and USFS Rte 4, surrounding Willow Creek;
- USFS Rte 5N01, USFS Rte 5N10, USFS Rte 1, and PVT - Redwood Valley, located near the southwestern portion of the Unit;
- USFS Rte 4, USFS Rte 06N10, and USFS Rte, located in the northeastern unit area.

Evacuation impediments may include: landslides, fallen trees, downed power lines, overgrown vegetation, poorly marked streets and intersections, and one-way-in, one-way-out roads that could inhibit evacuation and emergency response vehicles, or leave residents stranded should the roads become blocked.

During wildfire events that have the potential to threaten personal safety, community evacuation sites may be established where residents can go to survive a wildfire. Evacuation sites will be established in different locations depending on the anticipated path of the wildfire. The determination for the location of these sites is normally made by Humboldt County Emergency Operations Center Incident Commander in cooperation with an *Incident Management Team*. The Humboldt County Sheriffs and Emergency Officials will use mass communication and door-to-door methods to inform residents about the threat and where residents should go to take shelter.

If a catastrophic event occurs, residents may not be able to reach designated evacuation sites. In such cases, residents may need to make decisions on their own about seeking shelter where they can survive the passage of the wildfire until they can reach an evacuation site. It can be very difficult to determine the right thing to do as the fire approaches. Before a wildfire threatens, community members should talk to their local fire department about evacuation procedures in their neighborhood.

See section V.2.3 in Part V. Fire-Safe Communities for more information on preparing for safe evacuation and evacuation planning for pets and livestock. Also see section II.3.5 Evacuation Routes and Vulnerability in Part II. Risk Assessment for information about evacuation procedures and challenges in Humboldt County.

IV.7.8. Trinity Community Identified Potential Projects

The following section includes a summary of potential projects identified through the community processes discussed above. Some of the potential projects are illustrated on the community-identified projects map found at the end of this Unit Action Plan (Figure IV.7-3). This map includes projects carried over from the 2006 fire-planning process and those identified and refined during the 2011Willow Creek local CWPP development and the 2012 County CWPP

update process. In addition, Figure IV.7-2 illustrates Community-Identified Values and Assets, Hazards and Risks, and Wildfire Protection Resources. The maps in Figure IV.7-2 and Figure IV.7-3 can each be used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt County Web GIS Portal, "Fire Planning" section: http://gis.co.humboldt.ca.us/.

Because of the tremendous amount of work that has been accomplished within this unit and the existence of a local CWPP, a project matrix was not included in this Unit Action Plan. All of the geographic community identified project information is cataloged in the Web GIS Portal described above as well as in the Greater Willow Creek CWPP. This County CWPP incorporates that information by reference here. This information will continue to be made available as a resource for capturing grant funds and continued project implementation tracking.

Project ideas are also listed that are not visible on the maps, because they are not geographically based. These proposed actions also add to and expand upon the 2006 plan, based on the 2012 process (including the County CWPP update, the local CWPP, and the Firewise action plan). Because of the complexity of the planning process in this unit, the community identified potential projects are broken out into the following categories:

- CWPP Action Items,
- Firewise Action Items

CWPP Action Items

The Greater Willow Creek Area CWPP lists and outlines various types of projects that have been proposed to improve fire safety in the area in a five to ten year action plan. These projects fall under the categories of:

- Reduce Structural Ignitability
- Support and Improve Fire Protection Capabilities
- Treatment of Hazardous Fuels
- Education
- Planning

The following summarizes the projects proposed in the Greater Willow Creek Area CWPP. A complete copy of the Greater Willow Creek Area CWPP, which includes the table of coded projects mentioned above, can be found on the Willow Creek FSC[21] and Humboldt County FSC[22] websites.

- Proposed projects to **Reduce Structural Ignitability** include: lessening the vulnerability of homes to damage from wildfire by retrofitting flammable roofs, siding, gutters, etc. with ignition-resistant materials; and creating and maintaining defensible space in the Home Ignition Zone by thinning fuels and implementing fire-wise landscaping.
- Proposed projects intended to **Support and Improve Fire Protection Capabilities** include actions that aim to make firefighters' jobs easier. These projects include: supplying sufficient water for fire protection by adding more water tanks, equipping water tanks with the proper fittings, and marking water sources so that they are easily identifiable; establishing emergency secondary access routes in remote, single-access neighborhoods; improving signage; and ensuring that firefighters have the necessary equipment and resources for providing adequate fire protection services.

[21] www.willowcreekfsc.org/

[22] www.co.humboldt.ca.us/natural-resources/fire_safe_council/

- Proposed projects for the **Treatment of Hazardous Fuels** include: removing dense vegetation along primary and residential access roads that could hinder emergency response or evacuation; reducing fuel loads located near critical facilities and valued community areas; collaborating with local, state, and federal partners to take steps toward returning the landscape to a closer semblance of its natural fire regime; and continuing to explore appropriate uses of prescribed burning.
- Proposed **Education** projects include: providing fire prevention informational materials and support to community members on topics such as, how to create a fire-safe Home Ignition Zone, and how to prepare for emergency evacuation; encouraging communities to obtain and maintain Firewise recognition; and conducting outreach in local schools with age-appropriate fire-safety materials and presentations for preschool through high school curriculums.
- Proposed **Planning** projects include maintaining the efforts of the existing fire safe council and encouraging the development of a new one in neighboring communities; and facilitating collaboration between planning partners and local community members to select and implement priority actions from within their local CWPP.

Firewise Action Items

The Firewise Action Plan, which resulted from the community Firewise assessment, contains a list of short-term actions with measurable objectives that can be done within the Home Ignition Zone, within high risk community areas, and the community at large. These actions are consistent with implementation of the Willow Creek Greater Area CWPP. The following summarize the projects proposed in the Firewise Action Plan:

- Publish **an educational brochure for community residents** entitled, "Living With Fire in the Lower Trinity" that includes material on home ignition prevention, evacuation readiness, and fire-safety in the WUI.
- Complete **fuels reduction projects** on approximately 38 acres in four Willow Creek neighborhoods; these projects have already been planned out and funding has been obtained for them.
- Complete wildfire hazard reduction with **FLASH** funding for ten property owners.
- Hold three **Neighborhood Cleanup Days** to help property owners in get rid of flammable debris and byproducts; this will be done with assistance from PG&E and CAL FIRE.
- Hold three **Sheriff Work Alternative Program (SWAP) Work Days** to reduce buildup of roadside fuels throughout the community.
- Host the **annual Firewise event,** the "Willow Creek Fire Safe Day & Youth Ecology Fair."

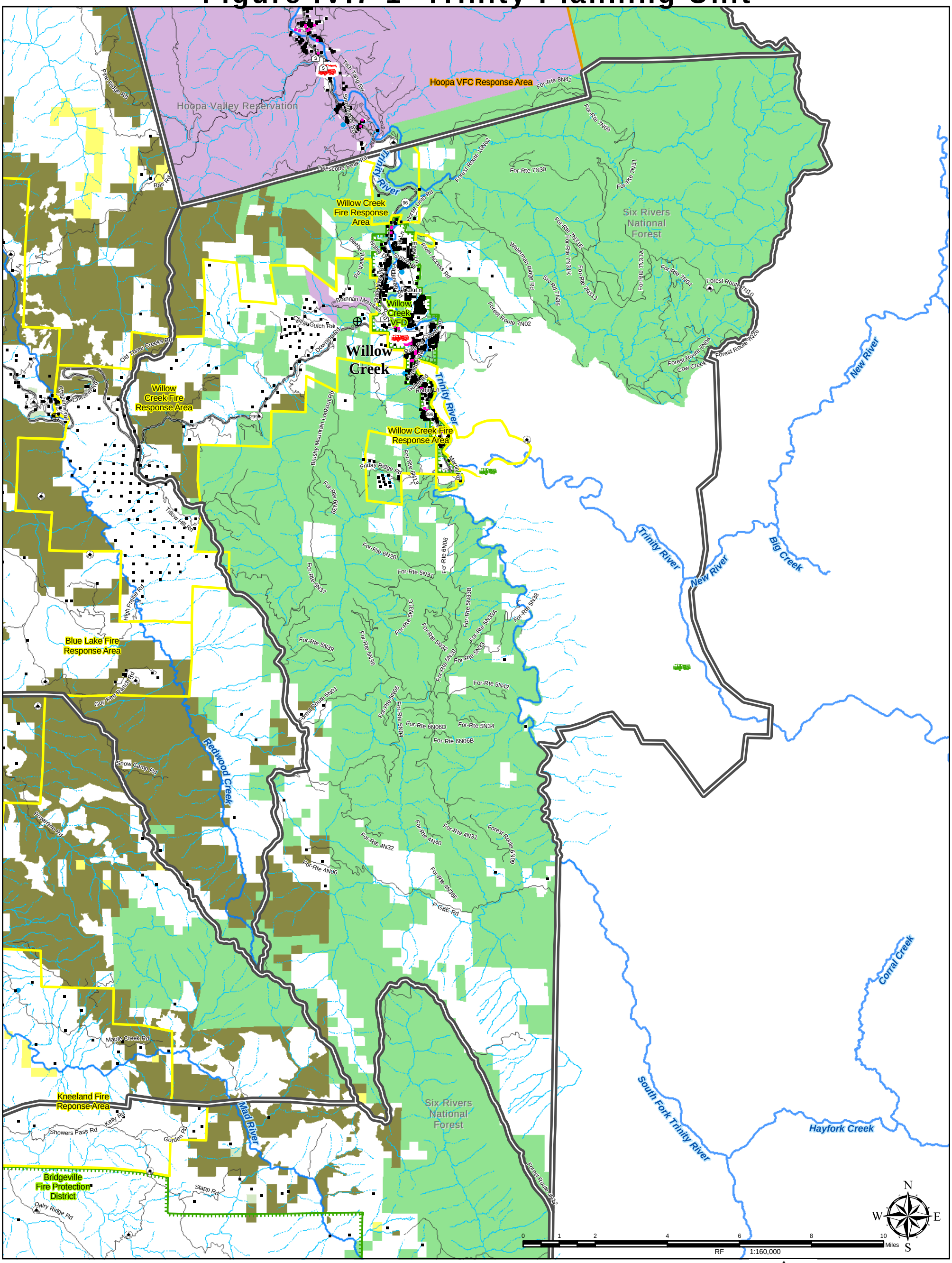
IV.7.9. Trinity Action Plan

The following items are the initial priorities for community action for the Trinity Planning Unit as recommended by this Humboldt County CWPP (not listed in order of priority). In an ideal world, everything recommended here would be implemented. However, it must be understood that implementation will be subject to the availability of funds and other resources and the willingness/ability of community members and Plan Partners to take action. This Action Plan can be cited in grant applications to leverage needed implementation funds and used to guide and inspire action. No vegetation *treatments* recommended in this plan will be carried out without the consent and involvement of the property owner and all applicable local, state and federal regulations must be observed.

- Maintain and support the WCFSC to facilitate community wildfire preparedness and mitigation.
- Ensure that the WCFSC continues to be represented on the Humboldt County FSC.
- Maintain and support the WCVFD to provide community emergency services.
- WCFSC work with the WCVFD, the Willow Creek Community Services district and other community groups to implement priority projects from the Greater Willow Creek Area CWPP (See the project matrix in the Greater Willow Creek Area CWPP as well as projects illustrated on the Web GIS Portal).
- This Plan recommends an initial focus on the following priority areas for fuels reduction as identified at the 2012 Community Workshop:
    - Bigfoot subdivision West
    - Patterson Road
    - Patterson Road North
    - Upper Brannan
    - Friday Ridge

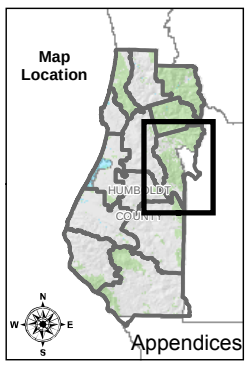
    Secondary priorities include:
    - Conducting fuel clearance along Otter Lane.
    - Improving defensible space in Trinity Acres neighborhood.
    - Landscape clearing and modifications to improve bottleneck situation on Highway 299, West of Willow Creek.
    - Conducting roadside clearance on fuels along Old Three Creeks.
- Apply to renew participation in the Firewise Communities/USA recognition program annually. This will include an annual update of the Firewise action plan, which can be used as a short-term Willow Creek CWPP implementation tool. Actively implementing and maintaining the Firewise action plan on an annual basis will take small bites out of the local CWPP which has a five to ten year planning horizon.
- Share geographic information on project implementation progress with County staff so that the project information of the County Web GIS Portal can be updated.
- WCFSC and WCVFD work with the Humboldt County Office of Emergency Services to engage community members in evacuation preparedness. Efforts should be made to ensure that local gates are open or accessible during Red Flag conditions.

Figure IV.7-1 Trinity Planning Unit



CWPP Unit Map

Map Location



Legend

- CWPP Planning Unit Boundary

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

Local Fire Organization Response Area
- District
- Out of District
- Non-Tax (Volunteer Fire Company (VFC))
- Proposed District Annexation Area (PDAA)

Improved Parcels
- Improved Parcel (not actual location of improvement)
- Commercial or Industrial Lot (not actual location)

Airports
- Landing Strip

Highways and Roads
- HWY 101
- State HWY
- HWY or Secondary Road
- Local Road or Street

Hydrography
- Major River or Stream

Infrastructure
- Gauging Station
- Water Tank or Source
- Historic Locations

Land Ownership

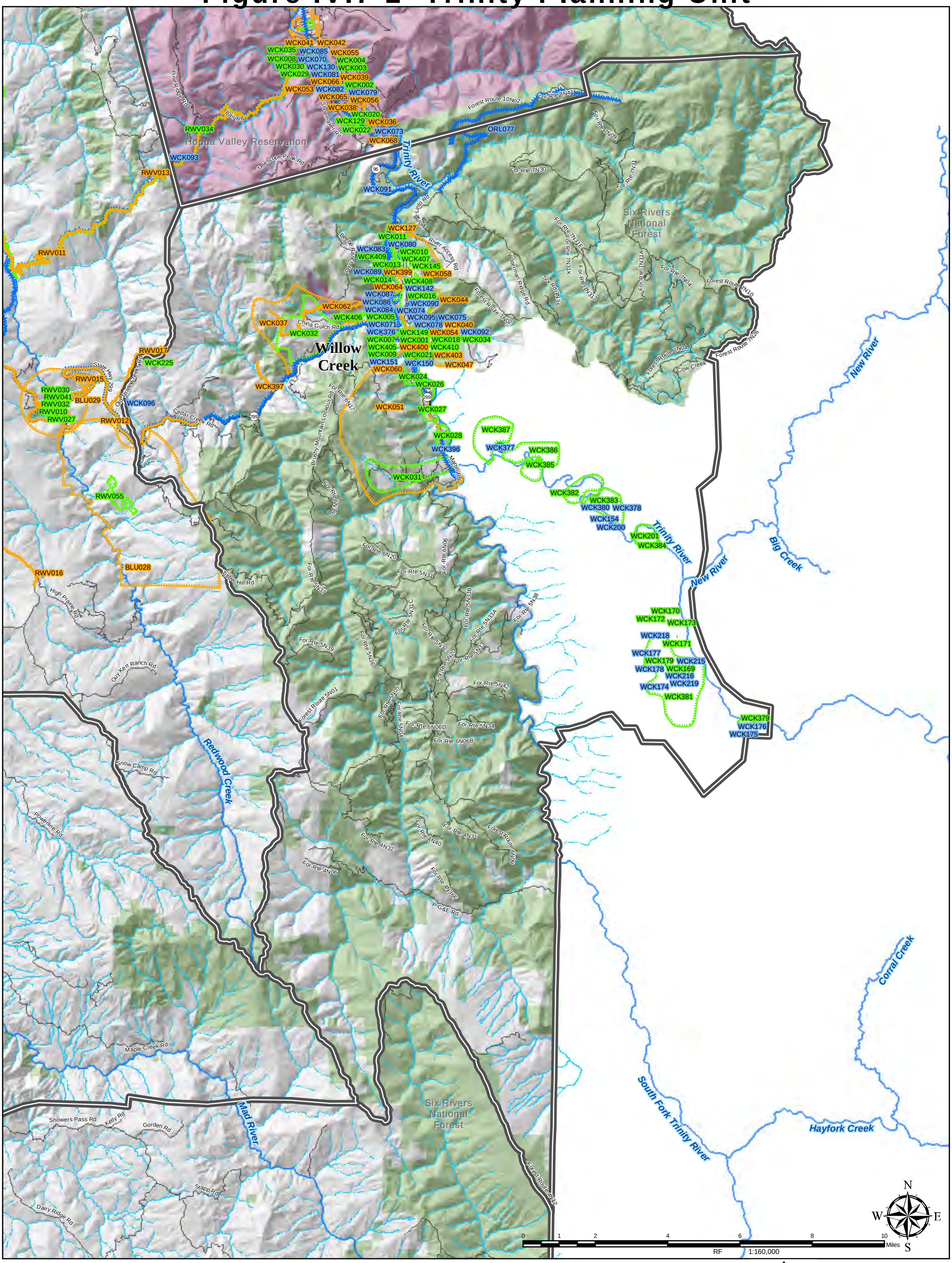
AGENCY
- Bureau of Land Management
- National Park Service
- State Park or Other State Lands
- Six Rivers National Forest
- U.S. Fish and Wildlife Service
- Tribal Lands
- Private
- Industrial Timber
- Cities

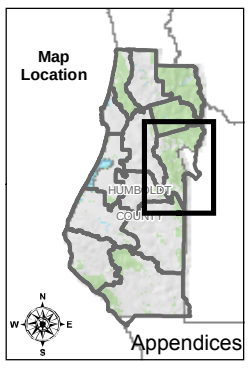
Land ownership and infrastructure data has been compiled by The County of Humboldt. Fire planning features identified at community workshops by residents; local, state, and federal fire service personnel; and Humboldt County staff. Other data sources were the 2006 Humboldt County Master Fire Protection Plan

This map is intended for planning purposes and should not be used for precise measurement or navigation.

Map compiled by County of Humboldt, March 2013.
Online maps visit: http://gis.co.humboldt.ca.us
Contact: cimmit@co.humboldt.ca.us or jvondohlen@co.humboldt.ca.us

Figure IV.7-2 Trinity Planning Unit





CWPP - Community Identified Protection, Values/Assets, & Risks/Hazards

Legend

CWPP PlanningUnit Boundary

Community Identified Features
- Protection/Evacuation
- Value/Asset
- Risk/Hazard

Land Ownership
- Parks/Public Land
- Reservation/Tribal Land
- Cities

Highways and Roads
- HWY 101
- State HWY
- HWY or Secondary Road
- Local Road or Street

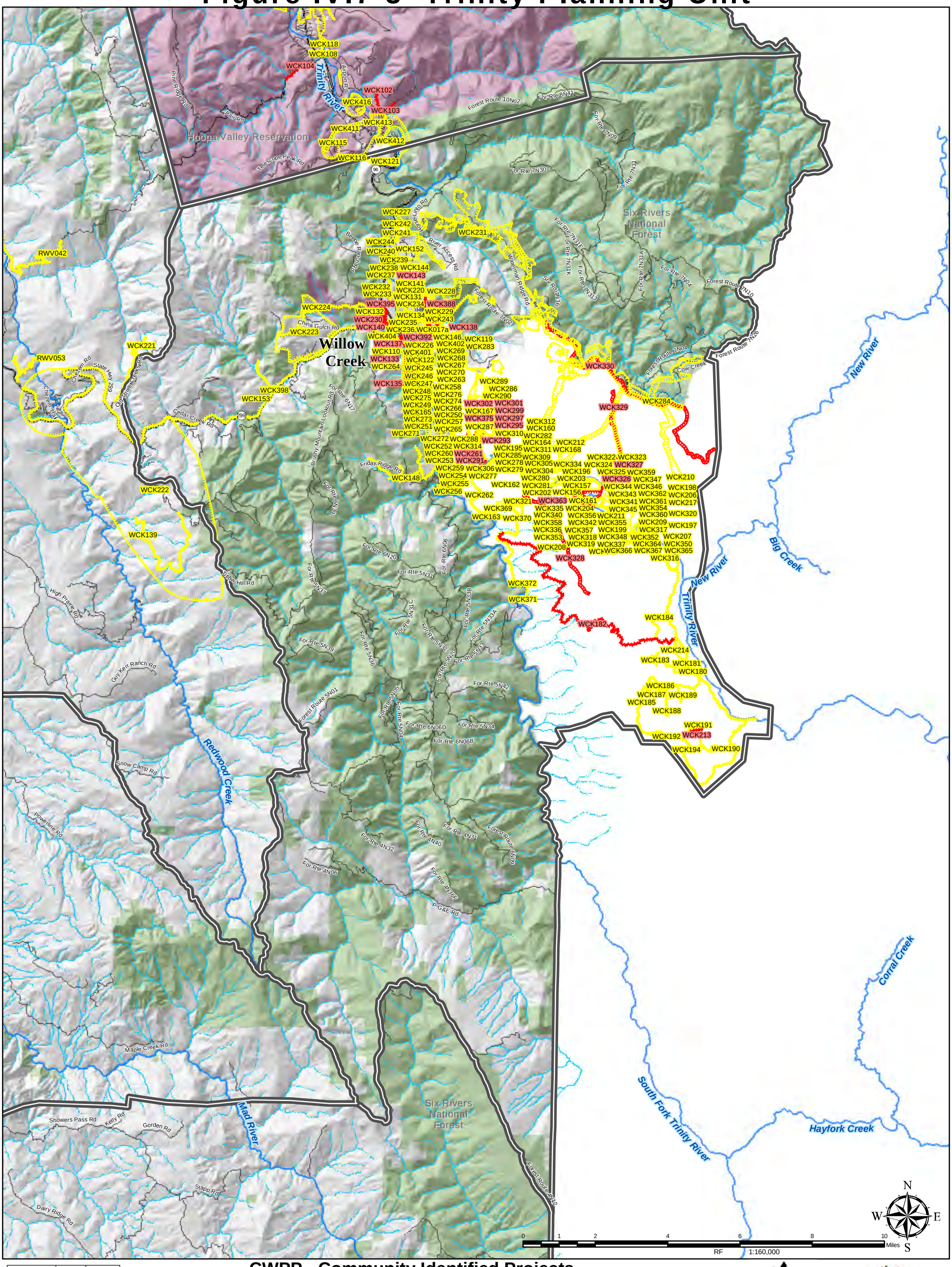
Hydrography
- Major River or Stream
- Perennial Stream
- Intermittent Stream

Land ownership and infrastructure data has been compiled by The County of Humboldt. Fire planning features identified at community workshops by residents; local, state, and federal fire service personnel; and Humboldt County staff. Other data sources were the 2006 Humboldt County Master Fire Protection Plan

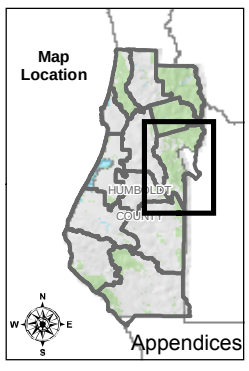
This map is intended for planning purposes and should not be used for precise measurement or navigation.

Map compiled by County of Humboldt, March 2013.
Online maps visit: http://gis.co.humboldt.ca.us/
Contact: cimmit@co.humboldt.ca.us or jvondohlen@co.humboldt.ca.us

Figure IV.7-3 Trinity Planning Unit



CWPP - Community Identified Projects



Legend

- CWPP Planning Unit Boundary
- **Community Identified Projects**
  - Proposed Project
  - Treated Project
- **Land Ownership**
  - Parks/Public Land
  - Reservation/Tribal Land
  - Cities
- **Highways and Roads**
  - HWY 101
  - State HWY
  - HWY or Secondary Road
  - Local Road or Street
- **Hydrography**
  - Major River or Stream
  - Perennial Stream
  - Intermittent Stream

Land ownership and infrastructure data has been compiled by The County of Humboldt. Fire planning features identified at community workshops by residents; local, state, and federal fire service personnel; and Humboldt County staff. Other data sources were the 2006 Humboldt County Master Fire Protection Plan

This map is intended for planning purposes and should not be used for precise measurement or navigation.

Map compiled by County of Humboldt, March 2013
Online maps visit: http://gis.co.humboldt.ca.us
Contact: cimmit@co.humboldt.ca.us or jvondohlen@co.humboldt.ca.us

IV.8. Eureka Plain Planning Unit Action Plan

IV.8.1. Eureka Plain Planning Unit Description

The Eureka Plain *Planning Unit* encompasses 143,780 acres situated along the central coast of Humboldt County and contains the most urbanized and populated areas within the county. The geography of the Unit is dominated by the Humboldt Bay, which spans approximately two-thirds of the Unit's coastline and is comprised of three sections: South Bay, Entrance Bay, and North Bay. Highway 101 serves as the primary transportation corridor through the Unit, bordering the bay and coastline with a north-to-south orientation. Highway 299 provides eastward access and joins Highway 101 in the northern portion of the Unit. The Eureka Plain *watershed* is comprised of four major waterways: Jacoby and Freshwater Creeks, which drain into the North Bay; Elk River, which flows into the Entrance Bay; and Salmon Creek, which meets the South Bay.

The cities of Eureka and Arcata surround Humboldt Bay and comprise the community population centers of this Planning Unit. The unincorporated town of McKinleyville to the north has experienced significant suburban growth in recent years and become a populous community as well. The lesser populated City of Blue Lake is located east of Arcata along Highway 299. Several other distinct, smaller communities are interspersed throughout the Unit as well, mainly surrounding the central cities. The Fields Landing and Ridgewood Heights communities are located south of Eureka. Inland, located between Eureka and Arcata, are the communities of Freshwater, Indianola, and Bayside. Bayside is just south of and adjacent to Sunny Brae, a community on the southeastern side of the City of Arcata. Fieldbrook is located inland from McKinleyville and north of the community of Glendale, which is off Highway 299, en route to Blue Lake. Communities clustered along the coastal side of the Humboldt Bay inlet include Fairhaven, Samoa and Manila. A map of this planning unit can be viewed in Figure IV.8-1. Eureka Plain Unit: CWPP Unit Map.

The characters of these numerous communities vary widely, from distinctly urban locales, to small-town neighborhoods, rural residential areas, and more remote homes located in the *wildland-urban interface* (WUI). It is these communities located in the hinterlands and in the WUI, on the outskirts of the more populated areas, which experience the greatest risk of loss from wildfire events.

Timber production is the dominant non-residential land use within this Planning Unit, and significant portions of land--especially in the southeastern portion--is managed by Humboldt Redwoods Company and, to a lesser extent, Green Diamond Resource Company (GDRCo). Agricultural land use is also common within the Unit, involving mainly pasturelands for livestock grazing and dairy production, as well as a few lily bulb farms in Arcata and McKinleyville.[1] Rural residential developments are scattered throughout the timber/grazing interface, which includes several parcels of ranchland, while urbanized development dominates the central population areas. Public lands including state and county parks make up a substantial proportion of the Unit. Areas of particular significance are:

- Headwaters Forest Reserve; managed by the Bureau of Land Management (BLM) and located southeast of Eureka amidst the timberlands;
- Humboldt Bay National Wildlife Refuge;
- Mad River Wildlife Area, also known as the Arcata Marshes;
- Elk River Wildlife Area;

[1] Dyett & Bhatia. (2002, September). Eureka Plain (Humboldt Bay) Watershed. *Humboldt 2025 General Plan Update: Natural Resources and Hazards; Vol. 2: Detailed Watershed Characteristics and Regulatory Framework Analysis.* Retrieved from http://www.co.humboldt.ca.us/gpu/documentsbackground.aspx.

- Lamphere Dunes; managed by the U.S. Fish and Wildlife Service.

IV.8.2. Eureka Plain Community Process Summary

Several open-house community workshops were held in various areas throughout the Planning Unit for the purpose of gathering local information and garnering public input regarding various factors contributing to the extent of wildfire risk and/or preparedness among the communities in this Unit, and to provide information about the countywide *community wildfire protection plan* (CWPP) update process. One workshop was held on May 14, 2012 at the Bayside Grange in Arcata, which included residents from Arcata, Bayside, and the Jacoby Creek neighborhood. A second workshop was held on June 21, 2012 at the Fieldbrook Elementary School for residents in the McKinleyville, Fieldbrook, Glendale, and Blue Lake communities. And a third workshop was held on June 25, 2012 at the Redwood Acres Fairgrounds in Eureka, involving residents in Eureka and its surrounding communities. A group exercise, which involved maps of the Planning Unit area, invited those attending each of these workshops to help identify and pinpoint on the map where particular *fire hazards* exist, the location of *protection resources*, such as fire water drafting sites, as well as values and *assets at risk* within the community that could be threatened by wildfire. These workshop processes also provided an opportunity for participating community members to ask questions and provide information based on their local knowledge.

Participants were also asked to review pre-existing information illustrated on the maps which had been added by community members during similar workshops that took place during the initial planning process in 2006. These workshops and mapping exercises also facilitated discussion among community members about potential actions that could be taken to reduce fire risk in their communities. Through discussion and collaborative processes, participants identified major hazard areas and compiled lists of project proposals for enhancing their communities' fire preparedness.

The community-identified fire hazards, protection resources, and values and assets at risk discussed throughout the following sections of this Planning Unit Action Plan reflect information generated by these community workshop mapping exercises, as well as information resulting from direct outreach to local fire departments and residents.

The project proposals resulting from community member discussions are contained in section IV.8.8. Community-Identified Projects in this Planning Unit Action Plan.

IV.8.3. Eureka Plain Wildfire Environment

The majority of the Eureka Plain Planning Unit (68%) is zoned "High *Fire Hazard Severity*," as determined by the California Department of Forestry and Fire Protection (CAL FIRE).[2] However, approximately 17% of the Unit area, including many of the central communities, are zoned "Moderate Fire Hazard Severity," with less than 1% of the Unit zoned "Very High Fire Hazard Severity." A substantial portion of the more populated areas are within the *Local Responsibility Area* (LRA) and are therefore not zoned by CAL FIRE. The terrain around the bay is primarily made up of flat lands consisting of urbanized areas and pasturelands. Further inland, where *wildfire risk* is greater, the terrain is mostly comprised of moderately steep forested areas.

The forestlands within this Unit are dominated by redwoods. To a much lesser extent, there are also fir and pine forests, as well as swaths of annual grasslands and areas of oak woodland. Wetlands and *riparian* areas are also distributed throughout the area. The Unit is characterized by cool, wet winters and mild summers. Weather patterns are heavily influenced by the Unit's

[2] CAL FIRE. (2007). *Fire Resources Assessment Program (FRAP).* [Map showing Fire Hazard Severity Zone ratings within various geographic areas, mapped by county]. Fire Hazard Severity Zones Map. Retrieved from http://frap.cdf.ca.gov/

proximity to the Pacific Coast, with regularly occurring fog blankets in the mornings that tend to break up by mid-afternoon, only to return again in the evenings.

Traditionally, fire was an integral part of the *ecosystems* in this region. Forest management by indigenous tribes often included low-intensity, intentional burns that helped enhance forest ecosystems and prevent the accumulation of high *fuel loads*. Some of the early settlers in the late 1800s also used intentional burning in order to clear and maintain grasslands for pasture animals. A heavy *fire suppression* campaign beginning in the 1940s has allowed the accumulation of dense, flammable vegetation in forest *understories*, which acts as *fuel* and increases the risk of high-intensity wildfires. Forest ecosystems, accustomed to low-intensity fires that would burn off *brush* and newer starts in the understory, become threatened by overcrowded forests and accumulated fuel. Intense timber harvests, which were common during the 20th century, had substantial impacts on the forest ecosystems in this region. Timber operations left behind heavy amounts of logging *slash*, and the replacement of old growths with second growth redwoods altered *stand compositions*, making them less resilient to *wildfires*.

In recent years, GDRCo has undertaken efforts to help reduce risk of wildfire occurrences within their territory. Firefighting equipment is maintained at logging operations and inside all vehicles; harvesting operations are suspended at specified levels of low *relative humidity*; and logging crews are required to make daily fire inspections after work is done during the *fire season*. Furthermore, the company maintains fire trucks and heavy equipment for wildland fire emergencies and GDRCo Forestry staff, logging and maintenance crews, and contractors are available to respond to fire emergencies on the company's timberlands and to assist CAL FIRE at their request. The company also treats logging fuels in a variety of ways to help reduce *fire hazards*. Their methods include piling and burning, *broadcast burning*, *mastication* and on-site chipping; they also employ *biomass recovery* for power generation with the vegetative debris produced by these activities.

Fortunately, fire occurrences in this Planning Unit have been minimal in recent decades, and CAL FIRE has no major fire events on record within this area since the Luffenholtz Fire in 1908, which burned over 690 acres in the northern region of the Unit.

Humans and human-related activities are the main wildfire *ignition sources* in this area. Potential human-related fire causes include: arson, equipment use, vehicle accidents, smoking, and unattended campfire and burn piles. Abandoned structures and vehicles are also ignition hazards because they present easy targets for arsonists. Lightning strikes and downed power lines are also potential fire-starters. This region is also seismically active, and the potential for earthquakes should always be considered in assessing fire risks.

Residences within this Planning Unit facing the greatest risk of *structural ignitability* are those located among communities in the remote hinterlands and within the WUI. These communities include Ridgewood Heights, Freshwater, Indianola, Fieldbrook, and neighborhoods located up along Jacoby Creek and Fickle Hill Roads. For these homes, there is an increased likelihood that wildland fires will become *structural fires* and vice versa.

Dead plant matter and vegetation with low *moisture levels* within 100-150 feet of homesteads pose some of the greatest threats to structural ignitability. Of particular concern are houses with needles and leaves accumulating on rooftops or in rain gutters. Houses with wooden rooftops and sidings add to this risk, as do the presence of wooden decks, particularly those with dead plant matter accumulated beneath them. Vegetation around structures in this Unit vary; some residences may support farms and gardens, while other parcels may be largely forested or contain pastures in small to medium openings in the forest. Although private properties tend to be located on more gentle terrain, some homes are surrounded by steep slopes that can limit their defensible areas and put structures in the line of up-hill spreading wildfires. Figure IV.8-2 found at the end of this Unit Action Plan illustrates risks and hazards identified by community members at public workshops and can be used as a key to access detailed descriptions of community-identified fire

planning features on the Humboldt County Web GIS Portal, "Fire Planning" section: http://gis.co.humboldt.ca.us/.

Highway 101 is the central *ingress and egress* route, followed by Highway 299, with numerous other primary roads, neighborhood streets, and backwoods roads splintering off of the main highway. Poor or complete lack of *signage* at roads and addresses in some neighborhoods pose potential problems for emergency ingress and egress; this is especially true for more remote residences that are further away from the main towns. The narrowness of smaller roads leading to these remote residences could create serious complications for emergency vehicle responses trying to gain access during simultaneous home evacuations. Some of these smaller routes are *one-way-in, one-way-out roads*, with no alternative route. Routes may also be grown over with heavy brush and tree limbs, and many properties have inadequate vehicle *turn around spaces*. The potential for landslides in these upslope areas could also inhibit access.

All of the cities and communities within this Planning Unit are provided with potable water and *fire protection water* by the Humboldt Bay Municipal Water District (HBMWD), which was formed in 1956 under the California Municipal Water Act of 1911. The HBMWD's facilities and operations include: the R.W. Matthews Dam and the associated Gosselin Hydro-Electric Power House; diversion, pumping and control facilities adjacent to the Mad River; storage and treatment facilities; and two separate pipeline systems for delivering drinking water and untreated, raw water to customers. [3] Numerous hydrants as well as city- and privately-owned water tanks are located throughout the cities of Eureka and Arcata. Additional fire protection water may be drawn from the following locations:

- Baywood Golf Course ponds (drafting)
- Doug's Pond (helicopters-yes; draft-no)
- Sampson's Pond (helicopter)
- Manila CSD ponds
- Morai's Pond
- Kernan Pond
- Mad River
- Morrison Gulch drafting sites
- Essex Dipping Pond
- Guynup's Pond
- Davenport Pond
- Blue Lake waste water ponds (helicopter)
- Fraser Pond
- Lane Pond
- Quarry Rd. drafting site

The map in Figure IV.8-2 found at the end of this Unit Action Plan illustrates these *drafting sites* as well as other community-identified wildfire *protection resources*. The map can be used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt Web GIS Portal, Fire Planning section: http://gis.co.humboldt.ca.us/.

IV.8.4. Eureka Plain Values and Assets at Risk

Assets at risk can be defined as those things that are important to quality of life that can be threatened with destruction or loss from wildfire. These may include community assets such as homes and businesses, as well as environmental values such as wildlife habitat, natural resources, and air quality, along with any other important attribute that individual communities rely on for their well being. Loss or damage to community assets as a result of wildfire can have short- or long-term impacts of varying severity, depending on the asset. Short-term loss caused by a wildfire can include the destruction of residences, commercial assets, timber, wildlife habitat, scenic vistas, and *watersheds*. Long-term effects may include displaced persons, smaller timber

[3] Humboldt Bay Municipal Water District. (2012). *About Us.* Retrieved from http://www.hbmwd.com/about.

harvests, reduced access to affected recreational areas, and destruction of cultural, ecological, and economic resources, and community infrastructure.

The *assets at risk* in this Unit are numerous and diverse. The majority of assets include residential homes, communities, and farmsteads, along with a variety of commercial and service industries, community centers, schools, fire stations, medical and dental centers, churches, post offices, along with infrastructure components such as water treatment facilities, and cell towers. Some particularly noteworthy assets within this Planning Unit include: California State University Humboldt, College of the Redwoods, the Arcata/Eureka Airport, the Mad River Community Hospital, the Blue Lake Casino, the Arcata Plaza, Redwood Acres Fairgrounds, and the Bayside Mall. Agricultural lands, timber stands, and industrial facilities are also valuable assets at risk. An extensive oyster industry operates out of Humboldt Bay, and the harbor there is a major shipping center for the North Coast. Commercial and recreational fishing is common throughout the coastal region as well; sites and facilities that support these industries are valuable assets as well.

The map in Figure IV.8-2 found at the end of this Unit Action Plan illustrates values and assets at risk to wildfire identified by community members at public workshops. The map can be used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt County Web GIS[4] Portal, "Fire Planning" section: http://gis.co.humboldt.ca.us/. Some of the community-identified assets at risk within this Unit include:

- Bayside Grange, Old Community Hall, Post Office, Mistwood School
- Samoa Cookhouse
- Humboldt Hill Communications Complex
- Blue Lake Industrial Area
- Manila CSD and Tanks
- Biomass Plant
- Two Feathers Health Center
- Boy Scout Camp
- Apple Orchard/farm –Fieldbrook Apple Farm
- Fairhaven Power Company
- Coast Guard Station
- Simpson Mill Site

This Unit also contains an abundance of environmentally and culturally significant areas, with a range of recreational opportunities available as well, such as hiking, kayaking, surfing, and rock climbing, In addition to the principal public lands aforementioned (e.g. the Headwaters Reserve and wildlife areas) there are numerous state/county parks and beaches throughout the Planning Unit, including:

- Mad River and Clam Beach County Parks
- Sequoia Park, Eureka
- Arcata Community Forest
- Hiller Park, McKinleyville

These environmentally significant areas hold great value for the communities that appreciate them and the wildlife that depends on them.

IV.8.5. Eureka Plain Community Preparedness

Fire preparedness in these communities is abetted by the Humboldt County *Fire Safe Council* (HCFSC), which was formed in 2002 by the County Board of Supervisors. The HCFSC's goals, in addition to implementing measured outlined in the countywide Master Fire Protection Plan, include: sharing fire-safety information, assessing fire risk, promoting community fire-safe planning and coordination, linking fire-prevention programs and providing support to local fire

[4] Geographic Information Systems (GIS).

services and fire safe councils (FSC).[5] The HCFSC has helped several community groups in the county establish their own FSCs, and has assisted many more communities in achieving national *Firewise* recognition, as well as helping these groups obtain grant funding for *fire hazard* mitigation activities such as *fuel reduction* projects.

Residents of the Jacoby Creek Road neighborhood—a community at risk of wildfire—formed the Upper Jacoby Creek Firewise Group after seeing a neighbor's home burn to the ground as the result of a chimney fire. At the end of 2012, this group produced a Community Assessment and an Action Plan, and successfully achieved national recognition as a Firewise Community. Some successful Firewise modifications include: implementing the "*Blue Dog Program*," where water tanks are clearly labeled and outfitted with reflective blue dots, improving signage by replacing old markers with reflective address signs, and raising fire-safe awareness by hosting a Firewise event and producing an informational brochure.

IV.8.6. Eureka Plain Wildfire Protection Capabilities

A host of *volunteer fire departments* (VFDs) provide fire protection, medical, and rescue services to communities within the many *fire protection districts* (FPDs) in this Planning Unit. The following fire protection services exist for the Eureka Plain Planning Unit:[6]

- **Humboldt Bay Fire (a joint operation between Humboldt #1 Fire Protection District and City of Eureka Fire Department)** has 25 volunteers out of 83 members. They serve 56,000 residents in approximately 56 square miles. They are equipped with three type-1 engines, with two additional type-1 engines on reserve, two vehicles for responding to hazardous emergencies, a type-2 search and rescue trailer, and one technical rescue equipment trailer. Humboldt Bay Fire can be reached by calling (707) 445-41900, or (707) 441-4000, or by visiting their website at: www.humboldtbayfire.org.
- **Arcata Fire Protection District** has 25 volunteers and a total of 54 members. They serve over 37,000 citizens in an area of 62 square miles that encompasses Arcata, McKinleyville, Manila, Jacoby Creek, Glendale, Indianola, and provides automatic aid, Fairhaven, Fieldbrook, Blue Lake, Eureka, Eureka / Arcata Airport, and Humboldt State University. The Arcata FPD can be reached by calling (707) 825-2000, or by visiting their website at: www.arcatafire.org.
- **Samoa Peninsula Fire District** has 14 volunteers who serve 350 residents in approximately 3.4 square miles. Their apparatuses include: two type-1 engines—E8611 and E8614, which hold 500 gallons and 1000 gallons, respectively, as well as E8646, a type-4 quick attack engine. The Samoa Peninsula Fire District can be reached by calling (707) 443-9042 or by visiting their website at: www.samoapeninsualfire.org.
- **Blue Lake Fire Protection District** has 26 volunteers. Their district area includes 14 square miles with a total response area of approximately 200 square miles. Their apparatuses include: two type-1 engines, 1 type-2 engine, one type-4 quick attack engine, a utility truck, a 2,200 gallon *water tender*, and a 1,750 gallon water tender. The Blue Lake FPD can be reached by calling (707) 668-5765, by email at: admin@bluelakefire.net, or by visiting their website at: www.bluelakefire.net.

[5] County of Humboldt, Natural Resources Planning. (2012). *Humboldt County Fire Safe Council.* Retrieved from www.co.humboldt.ca.us/natural-resources/fire_safe_council/fireserviceannualreport.aspx

[6] County of Humboldt, Natural Resources Planning. (2012). *Humboldt County Fire Chiefs Association Annual Report, 2010*. Humboldt County Fire Safe Council. Retrieved from http://www.co.humboldt.ca.us/natural-resources/fire_safe_council/fireserviceannualreport.aspx.

- **Fieldbrook Volunteer Fire Department** has 22 volunteers who serve approximately 1,200 residents in 10 square miles. Their apparatuses include: WT8756, an international Van Pelt water tender; E8715, a type-1 International Becker pumper; E8717, a type-1 Spartan Beck pumper; and E8747,,a type-4 quick attack truck. The Fieldbrook VFD can be reached by calling (707) 839-0931, by email at: info@fieldbrookfire.org, or by visiting their website at: www.fieldbrookfire.org.

Both the Blue Lake and Fieldbrook FPDs are in the process of exploring the possibility of annexing properties to which they frequently provide fire protection services but are not currently included within their district boundaries. The Korbel Volunteer Fire Brigade is not included within any FPD, but rather is maintained by Green Diamond Resource Company to help protect its mill site.

Emergency *response times* to the further removed communities in this Planning Unit can be lengthy due to poor road access that requires emergency vehicles to traverse the roads slowly and with extreme caution. There is also a need to improve access to fire protection water in several of the more remote communities.

IV.8.7. Eureka Plain Evacuation

Evacuation from the Eureka Plain Planning Unit will either travel north or south along Highway 101, or east on Highway 299, depending on law enforcement recommendation based on *fire behavior*, wind patterns, traffic, and ingress of emergency vehicles. There are numerous smaller roads connecting residences and neighborhoods to Highway 101. Adequate ingress and egress along these roads is vital to a large portion of the population that may need to access the main highway evacuation route and for firefighters who will be using the roads to access wildfires burning in upslope, remote areas.

Highway 255 (Samoa Blvd.) is crucial for accessing communities on the west side of the bay, although it can be accessed via both Eureka and Arcata. Access along Fieldbrook Rd. and Murray Rd. is necessary for reaching the community of Fieldbrook. Similarly, Walnut Dr. and West Gate Dr. are the only roads leading to the Ridgewood Heights community; and the community that exists up Elk River Rd. may only be accessed via that route. Maintaining proper clearance on these roads is extremely important for ensuring the safety of residents within these far-removed neighborhoods; overgrown vegetation can create hazardous conditions for firefighting *apparatuses* seeking access to these areas and can also hinder evacuation of residents in emergency situations.

Other evacuation impediments may include: landslides, fallen trees, downed power lines, poorly marked streets and intersections, and one-way-in, one-way-out roads that could inhibit evacuation and emergency response vehicles, or leave residents stranded should the roads become blocked.

Alternative evacuation routes within this Unit include:

- Old Arcata Rd./Myrtle Avenue in between Arcata and Eureka;
- Central Avenue into McKinleyville;
- Essex Ln. from 299 into McKinleyville;
- Janes Rd., Spear Ave., and Alliance Rd. through Arcata;
- Jackson Ranch Rd leading from Highway 255 into the Arcata bottoms;
- Walnut Dr., Ridgewood Dr., and Elk River Rd., to communities on the eastern outskirts of Eureka.

During wildfire events that have the potential to threaten personal safety, community evacuation sites may be established where residents can go to survive a wildfire. Evacuation sites will be established in different locations depending on the anticipated path of the wildfire. The

determination for the location of these sites is normally made by Humboldt County Emergency Operations Center Incident Commander in cooperation with an *Incident Management Team*. The Humboldt County Sheriffs and Emergency Officials will use mass communication and door-to-door methods to inform residents about the threat and where residents should go to take shelter.

If a catastrophic event occurs, residents may not be able to reach designated evacuation sites. In such cases, residents may need to make decisions on their own about seeking shelter where they can survive the passage of the wildfire until they can reach an evacuation site. It can be very difficult to determine the right thing to do as the fire approaches. Before a wildfire threatens, community members should talk to their local fire department about evacuation procedures in their neighborhood.

See section V.2.3 in Part V. Fire-Safe Communities for more information on preparing for safe evacuation and evacuation planning for pets and livestock. Also see section II.3.5 Evacuation Routes and Vulnerability in Part II. Risk Assessment for information about evacuation procedures and challenges in Humboldt County.

IV.8.8. Eureka Plain Community Identified Potential Projects

The following list and matrix includes community identified proposed projects based on input from the community processes discussed above. A detailed description of each heading in the matrix can be found in Appendix G: Descriptive Characteristics for Community Identified Projects Matrix. These projects are illustrated on the community-identified projects map found at the end of this Unit Action Plan (Figure IV.8-3). Projects include those carried over from the 2006 fire-planning process and those identified and refined during the 2012 CWPP update process. This information can also be viewed on the fire planning GIS Portal. The GIS Portal allows users to search for and view specific fire planning features by location or to zoom into a desired area from an aerial view. To access the Portal, go to: http://gis.co.humboldt.ca.us/ and choose "Fire Planning" from the list of mapping applications. The data collected through this Planning process are included in the GIS layers within the Portal.

No vegetation *treatments* recommended in this plan will be carried out without the consent and involvement of the property owner and all applicable local, state and federal regulations must be observed.

Non-geographic community identified proposed projects based on community workshop notes:

Greater Eureka

- Conduct *defensible space* education in interface areas.
- Close loop on dead-end/access roads where possible, and clear brush along roads. Areas with steep brushy slopes should be the top priority.
- Enhance water systems; especially Freshwater and Ridgewood for new developments.
- Implement a *Blue Dot Program* to identify water that is available for firefighting with a reflective blue dot. The program will also provide information about the importance of making firefighting water available and how to set it up properly. The Bottom Line: Water tanks must be full of water, accessible, and labeled.
- Create and distribute public education flyers where needed.
- Countywide project: Use creative ideas to maintain fuels reduction treatments. Eagle Scouts might want to maintain project.

Samoa

- Recruit more volunteers for fire department.
- Obtain more funding for fire department.

- Make emergency radios available.
- Install sirens for fire and tsunami alerts.
- Make emergency supplies (especially first aid) available for Manila residents.
- Improve mapping and communication with how CAL FIRE calls them out on incidents.
- Need better response maps for firefighters.
- Evacuation plan for assisting disabled children from Samoa Peninsula School.

Bayside

- Raise/obtain sufficient funding for adequate fire protection.
- Hog fuel *biomass utilization* support
- Defensible space incentives for Upper Jacoby Creek neighborhoods
- Community fire safety education
- Explore back access evacuation route from Jacoby Creek.—There is a need to punch roads through to connect with other nearby roads so that there is more than one-way-in and one-way-out for evacuation and emergency response. This will also facilitate getting full buildout of land zoned for more development. Right now, even though it is properly zoned, the rules about roads (width, length of dead-end road, turnouts, etc.) are an obstacle to more development. Priority areas of need are connecting Jacoby Creek Rd. with Baywood Lane and connecting Jacoby Creek Rd. to Kneeland Rd.
- Need for education about on-site water supply and visibly marking water available for fire protection.

Blue Lake

- Obtain permission to access ponds on private lands.
- Create more fire stations.
- Conduct community fire-safe education regularly (annually or every six months); dovetail fire-safe education with other community events.
- Start a fire safe council.
- Recruit more volunteer firefighters.
- Conduct door-to-door fire-safe education in high risk areas.

Fieldbrook

- Implement *Red Truck Program*, with community defensible space education.
- Allow no new development without year-round water supply and good road grading.
- Improve address signs (house #s) in the community.
- Design a fuels reduction demonstration project and follow it up with a fun educational event to showcase the project.
- Conduct community education on defensible space and dovetail these efforts with community events and fire department fundraisers – provide handouts and localized wildfire mitigation information.

McKinleyville

- Improve road sign and home address sign visibility throughout the community.
- Work towards obtaining sufficient funding for fire protection services.

Green Diamond

- Prioritize interface areas and high trespass areas for fuels reduction work – biomass as much of the residue as possible because burning is difficult in these areas (air quality and escape risks).
- Enhance wildfire detection and prevention program – teach people to call 911 if they see smoke.

Humboldt County Community Wildfire Protection Plan

LOCATION		Treatment/Project Information Eel Fire Planning Unit							
Number Corresponds with location on map	Community, Structure, or Area (Value at Risk)	Description	Status	Year	Type	Acres	Veg Type	Maintenance (actual or proposed)	Funding source (actual or proposed)
ARC035	Perimeter of forest Sunnybrae to Fickle Hill Rd	Sunnybrae shaded fuelbreak & protection zone	Treat-Med	2012	Landscape				grant-landowner-Assn.
ARC037	Eastern boundary of Woodland Heights	Woodland Heights: create shaded fuelbreak	Treat-Med	2012	Landscape				grant-landowner-Assn.
ARC038	All of Arcata east of Hwy 101	Arcata east of Hwy 101, ALL: encourage defensible space	Treat-Med	2012	Defensible Space				grant -landowner
BAY029	Upper Jacoby Creek	Upper Jacoby Creek water tank network	Action Need	2012	Other - Water				grant - fire dept.
BAY032	Fickle Hill Road	Fickle Hill: create shaded fuelbreak.	Treat-Med	2012	Landscape				grant-landowner-Assn.
BAY033	Garden Lane and Jacoby Creek Rd.	Develop safe zone at old quarry site	Treat-Med	2012	Other - Safe Zone	6.69			grant-landowner-Assn.
BAY045	Roberts Height Ln, off Jacoby Creek Rd	Roadside brush clearing for ingress and egress	Treat-Med	2012	Roadside Clearance and Other - Access				grant-landowner-Assn.
BAY046	Roberts Height Ln, off Jacoby Creek Rd	Pool could be developed as a water site	Action Needed	2012	Other - water				grant-landowner-Assn.
BAY047	Roberts Height Ln	Good site for the water id blue dot program	Action Needed	2012	Other - Water				grant-landowner-Assn.

Humboldt County Community Wildfire Protection Plan

LOCATION		Treatment/Project Information Eel Fire Planning Unit							
Number Corresponds with location on map	Community, Structure, or Area (Value at Risk)	Description	Status	Year	Type	Acres	Veg Type	Maintenance (actual or proposed)	Funding source (actual or proposed)
BAY048	Jacoby Creek Forest	Fuel reduction to create buffer between residential area and forest land in Jacoby Creek Forest	Treat-High	2012	Landscape				grant-landowner-Assn.
BAY049	Garden Ln, THREE SITES, off Jacoby Creek Rd	Need vegetation clearance around existing water tanks (protect H2O source)	Treat-High	2012	Defensible Space				grant-landowner-Assn.
BAY050	Garden Ln, off Jacoby Creek Rd	Understory clearing along Garden Lane	Treat-High	2012	Roadside Clearance				grant-landowner-Assn. (FLASH)
BAY052	Glory Lane, off Garden Lane	Understory clearing along Garden Lane	Treat-High	2012	Roadside Clearance				grant-landowner-Assn.
BAY053	Mtn Bike Trail, South Quarry Rd off Jacoby Cr Rd	Clearance along public recreation and fire access trail	Treat-Low	2012	Landscape and Other - Trails				grant-landowner-Assn.
BAY054	Abbey Ln, off Jacoby Creek Rd	Understory clearing along Abbey Lane	Treat-Med	2012	Roadside Clearance				grant-landowner-Assn.
BAY055	Upper Creek Rd	Understory clearing along Upper Creek Rd	Treat-Med	2012	Roadside Clearance				grant-landowner-Assn.
BLU050	Green Hill Rd Neighborhood	Fuel reduction above freeway below Green Hill Rd	Treat-Med		Roadside Clearance	5.36			grant-landowner-Assn.
BLU051	Community of Blue Lake	Brush clearance along walking paths	Treat-Med		Other - Trails	36.09			grant-landowner-Assn.

Humboldt County Community Wildfire Protection Plan

LOCATION		Treatment/Project Information Eel Fire Planning Unit							
Number Corresponds with location on map	Community, Structure, or Area (Value at Risk)	Description	Status	Year	Type	Acres	Veg Type	Maintenance (actual or proposed)	Funding source (actual or proposed)
BLU052	Liscomb Hill Neighborhood	Liscomb Hill Rd. - 2.5K gal. water source/tank for all area residents	Action Need	2010	Other - Water				
BLU057	Liscomb Hill Rd off Glendale Dr, E of Glendale	Liscomb Hill Neighborhood: maintain defensible space, improve road access	Treat - Med	2012	Defensible Space and Other - Acccess				
BLU059	West End Rd/Warren Creek Area, W of Blue Lake	West End/Warren Creek - connect Elizabeth to Cedar Hill; plan turnouts spaces for better access	Treat - Med	2012	Other - Access				
BLU061	Upper Blue Lake Blvd, Hwy 299, E of Blue Lake	Upper Blue Lake Blvd: roadside clearance, water tank development, and maintain defensible space	Treat - Med	2012	Roadside Clearance; Defensible Space; and Other - Water				Address access issues for the Elk River Court bridge, Headwaters haul bridge, and McKay Tract Bridge
BLU063	West End Rd, W of Blue Lake	West End Rd.: roadside brush clearing	Treat - Med	2012	Roadside Clearance				
EUR036	Freshwater Park	Freshwater Park: create a summer dam	Action need	2010	Other - Water				

Humboldt County Community Wildfire Protection Plan

LOCATION		Treatment/Project Information Eel Fire Planning Unit							
Number Corresponds with location on map	Community, Structure, or Area (Value at Risk)	Description	Status	Year	Type	Acres	Veg Type	Maintenance (actual or proposed)	Funding source (actual or proposed)
EUR037	Pine Hill neighborhood	Pine Hill Ave: drafting location @ Martin Slough	Action need	2010	Other - Water				
EUR047	Elk River Community	Elk River Court bridge: fix/ engineer bridge to improve access.	Action need	2010	Other - Access				
EUR048	McKay Tract	Fix McKay Tract Bridge	Action need	2010	Other - Access				
EUR049	Headwaters	Fix Headwaters haul bridge to improve access.	Action need	2010	Other - Access				
EUR051	Berta Rd and off shoot roads	Post address and street signs (esp. on private roads); roadside clearance; improve access and water availability.	Treat - Med	2012	Roadside Clearance and Other - Signage and Other - Water				
EUR053	Vista Rd and dead-end off shoot roods	Post address and street signs (esp. on private roads); roadside clearance; improve access and water availability.	Treat - Med	2012	Roadside Clearance and Other - Signage and Other - Water				

LOCATION		Treatment/Project Information Eel Fire Planning Unit							
Number Corresponds with location on map	**Community, Structure, or Area (Value at Risk)**	**Description**	**Status**	**Year**	**Type**	**Acres**	**Veg Type**	**Maintenance (actual or proposed)**	**Funding source (actual or proposed)**
EUR056	Neighborhoods north of Myrtle Ave, Ryan-Freshwater Creeks	Post address and street signs (esp. on private roads); roadside clearance; improve access and water availability.	Treat - Med	2012	Roadside Clearance Other - Access and Other - Signage and Other - Water				
EUR058	Indianola neighborhoods	Post address and street signs (esp. on private roads); roadside clearance; improve access and water availability.	Treat - Med	2012	Landscape and Other - Access and Other - Water				
EUR060	Redmond Rd and off shoots and dead-end roads	Post address and street signs (esp. on private roads); roadside clearance; improve access and water availability. Paint hydrants to improve visibility.	Treat - Med	2012	Landscape and Other - Access and Other - Water				
FIE039	Community of Fieldbrook	County brush clearance along Fieldbrook Rd	Treat-Med		Roadside Clearance				County Rds.

Humboldt County Community Wildfire Protection Plan

LOCATION		Treatment/Project Information Eel Fire Planning Unit							
Number Corresponds with location on map	Community, Structure, or Area (Value at Risk)	Description	Status	Year	Type	Acres	Veg Type	Maintenance (actual or proposed)	Funding source (actual or proposed)
FIE040	Van Eck Neighborhood	North Line of Fieldbrook / Van Eck unit: shaded fuelbreak	Treat-Med		Landscape	1.31			grant-landowner-Assn.
FIE041	Van Eck / Lindsey Creek & Mather Estates Neighborhood	Shaded fuelbreak between Van Eck / Lindsey Crk & Mather Estates	Treat-Med		Landscape	7.84			grant-landowner-Assn.
FIE042	Community of Fieldbrook	Sawdust Trail: brush clearance for shaded fuelbreak.	Treat-Med		Roadside Clearance	0			grant-landowner-Assn.
FIE045	Community of Fieldbrook	Old Railroad Grade North: brush clearance along roadsides.	Treat-Med		Roadside Clearance	0			grant-landowner-Assn.
FIE046	Rock Pit Rd, north of Fieldbrook	Rock Pit Quarry - roadside clearing for access/hazard reduction	Treat - Med	2012	Roadside Clearace and Other - Access	0			grant-landowner-Assn.
FIE047	Old Railroad Grade North. north of Fieldbrook	Old Railroad Grade North: roadside clearing for access; maintain defensible space	Treat - Med	2012	Roadside Clearance and Defensible Space				grant-landowner-Assn.

Humboldt County Community Wildfire Protection Plan

LOCATION		Treatment/Project Information Eel Fire Planning Unit							
Number Corresponds with location on map	Community, Structure, or Area (Value at Risk)	Description	Status	Year	Type	Acres	Veg Type	Maintenance (actual or proposed)	Funding source (actual or proposed)
FIE051	Hwy 299, Timmons Ln - Essex Ln, W of Glendale	Essex Gulch - improve access, , turnouts; conduct roadside brush clearing	Treat - Med	2012	Roadside Clearance and Other - Access				grant-landowner-Assn.
FIE053	Cloudwood Rd, E of Fieldbrook	Cloudwood Rd - understory clearance	Treat - Med	2012	Landscape				grant-landowner Assn.
FIE054	Buckman Trail Ln, Murray Rd, W of Fieldbrook	Buckman Tr Ln - understory clearance	Treat - Med	2012	Landscape				grant-landowner Assn.
FIE056	Hughes Way, Murray Rd, W of Fieldbrook	Hughes Way - fuel reduction, 3 hydrants, pump station, 15000gal tank	Treat - Med	2012	Landscape and Other - Water				? green diamond ?
KNE047	Greenwood Heights Drive	Greenwood Hts Dr./Freshwater Rd: maintain defensible space and road buffers and improve access clearance.	Treat-Med	2012	Landscape and Roadside Clearance				grant-landowner-Assn.
KNE056	Barry and Tim Mullen's Road, Kneeland	Clear brush and mow grass along roads (buffers), people's driveways, homes	Treat - Med		Roadside Clearance and Defensible Space				

Humboldt County Community Wildfire Protection Plan

LOCATION		Treatment/Project Information Eel Fire Planning Unit							
Number Corresponds with location on map	Community, Structure, or Area (Value at Risk)	Description	Status	Year	Type	Acres	Veg Type	Maintenance (actual or proposed)	Funding source (actual or proposed)
MCK006	McKinleyville Community	Create a buffer between area east of town and interface zones	Treat-Med	2012	Landscape				grant-landowner-Assn.
MCK008	Arthur and Elizabeth Road area	Clearly mark houses and roads (street names and numbers)	Action Need		Other - Signage				grant-landowner-Assn.
PAC001	Northern boundary Humboldt Redwood Company; Freshwater-Kneeland area	Fuel reduction in WUI areas.	Treat-Med		Landscape				grant-landowner-Assn.
PAC002	04N 01E SEC's 21,22,26,25 & 04N 02E SEC 19	Fuel reduction to improve breaks on fire suppression ridges; targeted for additional treatment	Treat-Med		Landscape				grant-landowner-Assn.
SAM061	W of Lincoln Ave, Fairhaven	Regularly clear fuels in empty lots	Treat - Med	2012	Landscape				

IV.8.9. Eureka Plain Action Plan

The following items are the initial priorities for community action for the Eureka Plain Planning Unit as recommended by this Humboldt County CWPP (not listed in order of priority). In an ideal world, everything recommended here would be implemented. However, it must be understood that implementation will be subject to the availability of funds and other resources and the willingness/ability of community members and Plan Partners to take action. This Action Plan can be cited in grant applications to leverage needed implementation funds and used to guide and inspire action.

Enhancing Fire Protection

- **Sustainable Fire Departments:** Community members within this Planning Unit should support their local fire department[7] through activities such as volunteering as firefighters or auxiliary members, making donations, supporting fundraisers, writing grants, and/or helping with administrative tasks. With community support, local fire departments can continue to provide a wide variety of vital emergency services. Focus initial efforts on the following priorities:
  - Develop a recruitment strategy for adding more volunteers to the local fire departments; particularly Samoa Peninsula and Blue Lake Fire Departments.
  - Explore possibilities for expanding the boundaries of the Blue Lake Fire Protection District to provide service to the Maple Creek and Redwood Creek areas. These efforts will likely necessitate the approval of a special tax or benefit assessment to support service in the expanded jurisdiction.
- **Road Improvements:** Address road conditions that inhibit effective evacuation and access by emergency responders. Begin by systematically identifying and mitigating such access impediments. The following priority access issues were identified at community workshops and are recommended for initial action in this plan:
  - Address the issue of dead-end roads by exploring the possibility of connecting excising roads to create a secondary access point. This is particularly important for the Upper Jacoby Creek Community and several roads in the community of Fieldbrook as well as greater Eureka area neighborhoods.
  - Address access issues for the Elk River Court bridge, Headwaters haul bridge, and McKay Tract Bridge
- **Signage:** To aid emergency responders, residents and road associations should improve road and address signage throughout their communities. Make signs larger and reflective to increase visibility and install road and address signs where they are missing. Less noticeable but more sentimental address signs may remain but it is important to also post reflective signs with lettering at least three inches in height. Focus initial efforts in the following areas:
  - McKinleyville: Arthur and Elizabeth Road area
  - Greater Eureka Area: Berta, Vista, Redmond Roads and their dead-end off shoots
  - Neighborhoods north of Myrtle Ave, Ryan-Freshwater Creeks, Redmond Road
- **Firefighting Water:** Increase the availability of water for fire protection by making water access locations known to fire departments and investing in more community water tanks. Neighborhood and road associations and/or Firewise Communities work with local fire departments to develop a "Blue Dot" program, which identifies the location of firefighting water sources by marking them with a blue reflective dot. It is also helpful to

[7] *All local fire departments within this unit are listed above with their contact information in the "Wildfire Protection Capabilities" section.*

Paint hydrants to improve visibility. This program also ensures that tanks and water systems are outfitted with fittings compatible with firefighting equipment. Begin by identifying where such a program is most needed.

- The Humboldt Bar Fire Chiefs Association should coordinate to develop a Blue Dot program for priority areas within the Planning Unit. Priority areas will include neighborhoods not served by a community water system.
- Blue Lake: Ensure that all residents in the Liscomb Hill Road area have a 2,500 gallon water tank.
- Enhance water systems to ensure sufficient emergency water supply for future development in the Freshwater and Ridgewood areas.

Creating Fire Safe Communities

- **Firewise Communities:** Pursue participation in the Firewise Communities/USA recognition program with neighborhood groups in developed areas adjacent to the wildland, particularly where there are many residences located along dead-end roads. Actively implement and maintain the Firewise action plan on an annual schedule. Target the following neighborhoods on edges of communities in the higher risk interface areas, possibly through an affiliation with a road association:
  - Upper Jacoby Creek
  - Blue Lake
  - Fieldbrook

Ensuring Safe and Effective Evacuation

- Encourage fire department representatives from each department within this Planning Unit to work with the Humboldt County Office of Emergency Services and local law enforcement to conduct local evacuation preparedness planning and outreach. Efforts should be made to ensure that local gates are open or accessible during Red Flag conditions. Focus evacuation planning efforts in neighborhoods located along the following single access roads:
  - Upper Jacoby Creek
  - Liscomb Hill
  - Dead-end roads to WUI neighborhoods in the Greater Eureka Area

Promoting Fire Safe Education

- Conduct public education and outreach efforts regarding strategies for fire safety, maintaining defensible space, and evacuation planning. Send out informational material in mailers throughout the communities. Consider involving Boy Scouts and Girl Scouts of America in outreach efforts. Focus initial educational efforts in all of the WUI neighborhoods on the outskirts of the more urbanized areas.
  - Provide education on fire protection and preparedness for community members. Inform people about how to call 911 more effectively and familiarize residents with fire protection service jurisdictional areas and response times.
  - Utilize the Bayside Grange as an information resource with a kiosk or bulletin board.

Reducing Wildfire Fuels (Flammable Vegetation)

  - **Defensible Space:** Those residents living in areas within this Planning Unit that are at risk to wildfire should manage the flammable vegetation within their home ignition zone. Maintaining *defensible space* through vegetation treatments should be a routine and ongoing practice for all homes and *landscapes.* Community *Chipper Days* can facilitate this process by helping landowners get rid of slash

and brush piles so that they do not become an additional hazard. Begin by identifying where defensible space is most needed within the planning unit. Priority neighborhoods in this Unit are those adjacent to forested wildland particularly where there is a predominance of older pre-WUI building code construction. Work with local fire departments to identify initial priorities for targeted outreach.

- **Roadside Clearance:** Manage roadside vegetation in order to improve and maintain access for emergency vehicles and ensure safe evacuation. Consider working with the California Conservation Corps or County Public Works Roads Division. Many roads in the Unit were identified at community workshops as needing vegetation treatment. The highest priority should be those with the largest populations, highest fuel loads, and most remote locations. Coordinate with local fire officials to identify target roads.
- **Landscape Fuels Reduction:** Construct *shaded fuelbreaks* as buffers between residential areas and wildlands to slow the progress of wildfires. This allows firefighters a higher probability of successfully protecting communities from wildfire damage. These buffers may also protect the wildlands from the spread of fires originating within communities. The following areas are recommended for priority treatment in this plan:
    - Create a buffer between the forested area east of McKinleyville and the interface zones.
    - Regularly clear fuels in empty lots in Fairhaven

Figure IV.8-1 Eureka Plain Planning Unit

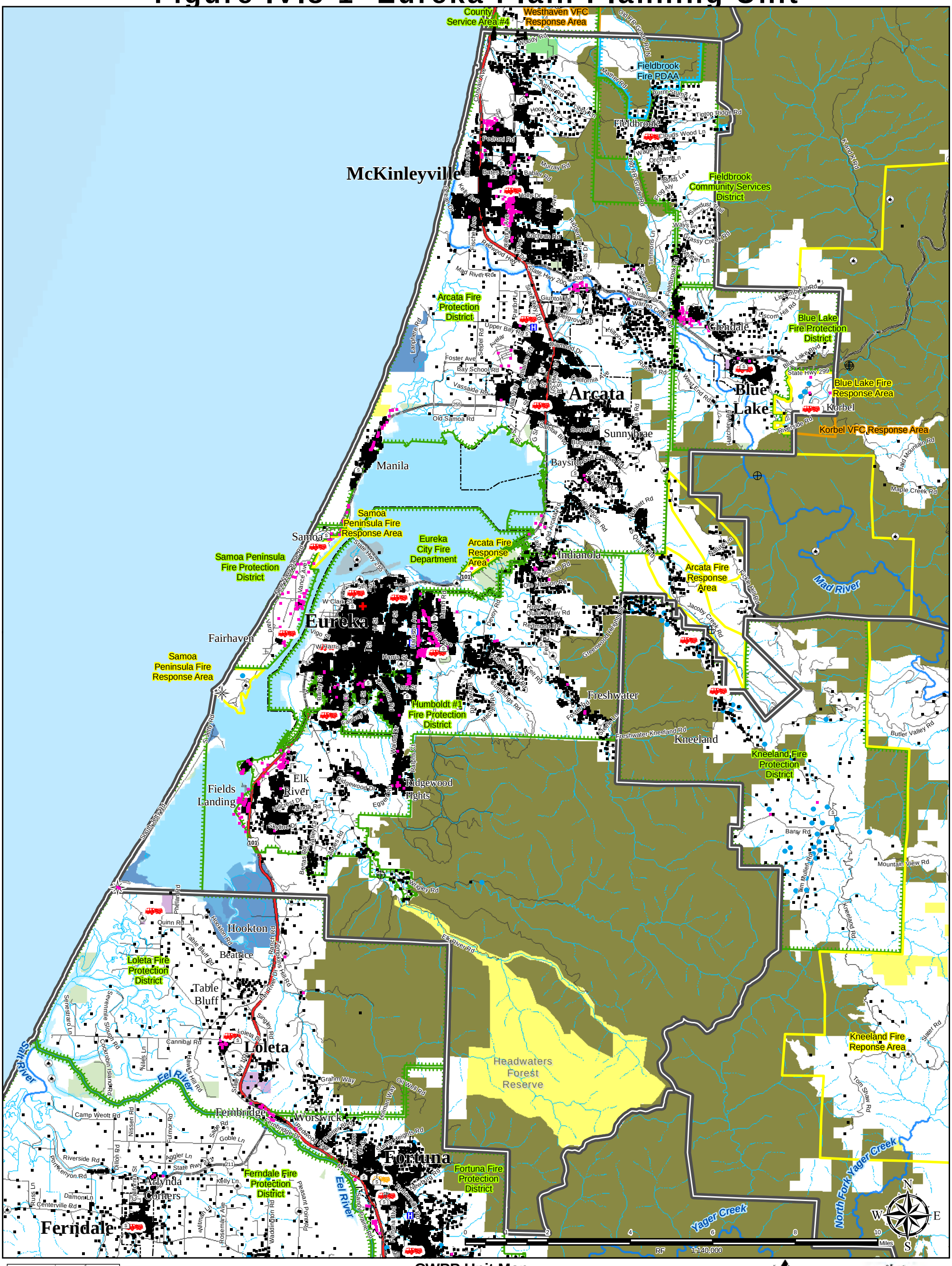
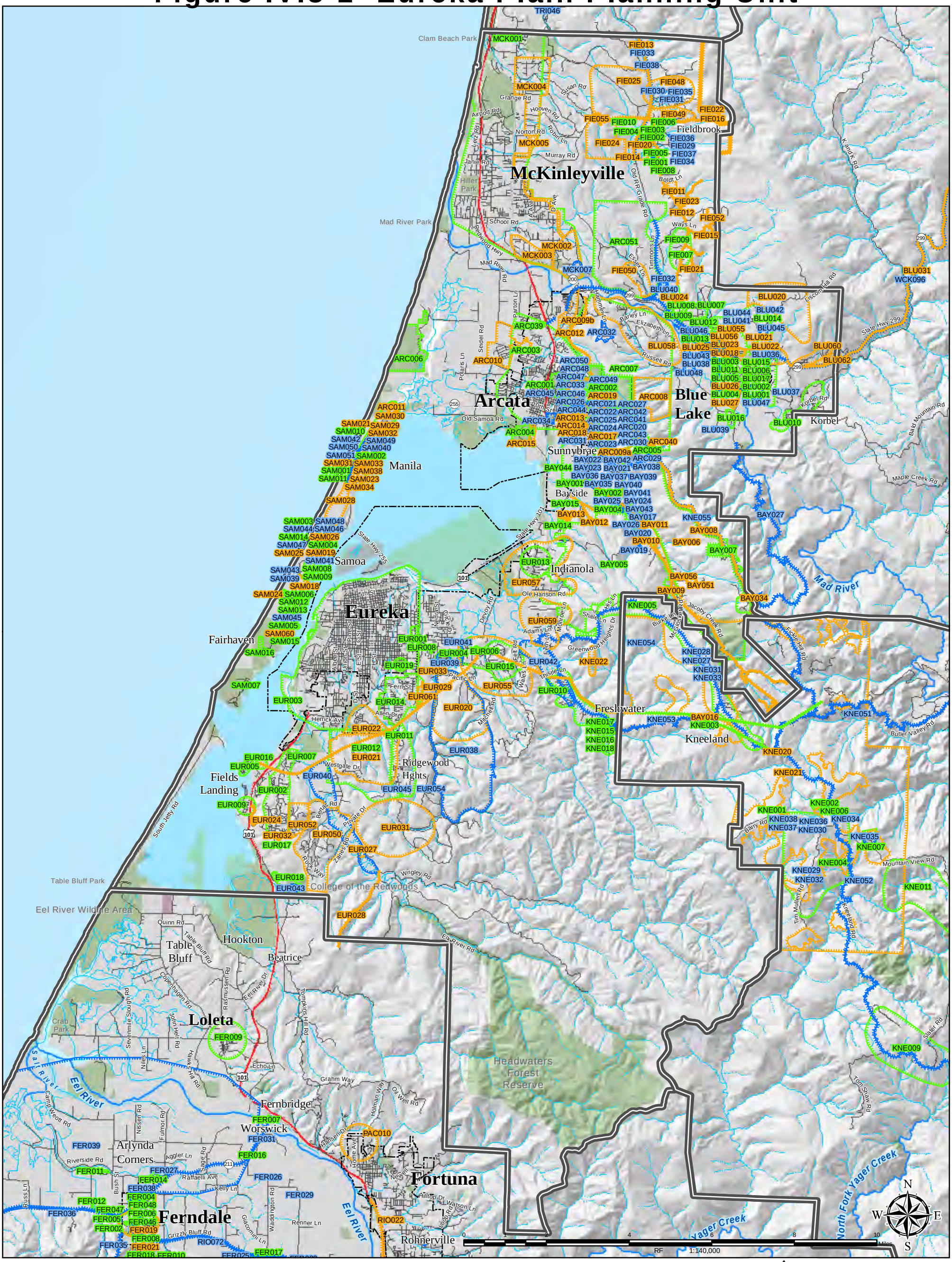
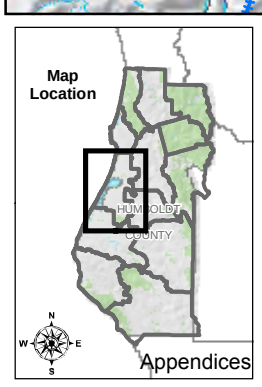

McKinleyville
Arcata
Blue Lake
Eureka
Fortuna
Ferndale
Manila
Samoa
Fairhaven
Fields Landing
Elk River
Ridgewood Hghts
Bayside
Sunnybrae
Glendale
Indianola
Freshwater
Kneeland
Hookton
Beatrice
Table Bluff
Loleta
Fernbridge
Ferndale
Cannibal Rd
Quinn Rd
Phelan Rd
Hookton Rd
Table Bluff Rd
Eel River Dr
Ranch Rd
Hawks Hill Rd
Singley Rd
Loleta Dr
Cannibal Rd
Niles Ln
Sevenmile Slough Rd
Cookcobin Island Rd
Senestraro Ln
Camp Weott Rd
Nissen Rd
Fulmor Rd
Sale Rd
Goble Ln
Riverside Rd
Dillon Rd
Aggler Ln
State Hwy 211
Porky Kenyon Rd
Kelly Ln
Damon Ln
Fruss Ln
Centerville Rd
Cochran Rd
Holly Dr
Babler Rd
Bates Rd
Pedroni Rd
Murray Rd
Mad River Rd
Redwood Hwy
State Hwy 200
Giuntoli Ln
Upper Bay Rd
Avelar
Foster Ave
Bay School Rd
Vassaide Rd
Old Samoa Rd
Diamond Dr
Hillcrest Dr
Lindsay Rd
Skyline Dr
Ridgewood Dr
Eggert Rd
Elk River Rd
Wrigley Rd
Grahm Way
Oil Well Rd
Holman Way
Redwood Hwy
Palmer Blvd
Rohnerville Rd
Newburg Rd
Main St
Sandy Prairie Rd
Eel River
Yager Creek
North Fork Yager Creek
Mad River
Freshwater-Kneeland Rd
Butler Valley Rd
Barry Rd
Mountain View Rd
Kneeland Rd
Slater Rd
Tom Shaw Rd
Jim Mullen Rd
Maple Creek Rd
Korbel
Korbel VFC Response Area
Blue Lake Fire Response Area
Kneeland Fire Reponse Area
Arcata Fire Response Area
Eureka City Fire Department
Samoa Peninsula Fire Response Area
Samoa Peninsula Fire Protection District
Humboldt #1 Fire Protection District
Fortuna Fire Protection District
Ferndale Fire Protection District
Loleta Fire Protection District
Kneeland Fire Protection District
Blue Lake Fire Protection District
Arcata Fire Protection District
Fieldbrook Fire PDAA
Fieldbrook Community Services District
County Service Area #4
Westhaven VFC Response Area
Headwaters Forest Reserve
Old RR Grade RUN
Old RR Grade Rd
Fieldbrook
Tipton Ridge Rd
Clouds Wood Ln
Orchard Ln
Weasel Ln
Burnt Stump Ln
Nather Rd
Arthur Rd
Hooven Rd
Upp Ln
Conrad Ave
Boiler Ave
Kelly Ave
Fischer Ave
Central Ave
A Ave
B Ave
Hidden Trail Dr
Timmons Ln
Boldt Ln
Frog Aly
Sawdust Trail
Ways Ln
Grassy Creek Rd
Whitlow Ln
Essery Ln
Fieldbrook Rd
Glendale Dr
Warren Creek Rd
Liscom Hill Rd
Blue Lake Blvd
State Hwy 299
Riverside Rd
Hatchery Rd
Bald Mountain Rd
Kane K Rd
Tuttle Ln
Hiller Ln
Hillcrest Ln
Partone Ln
Ridgewood Rd
Langhere Rd
Foster Ave
Sedger Rd
Avelar
Diamond Dr
Russell Rd
West End Rd
California Ave
Samoa Blvd
Buttermilk Ln
Golf Course Rd
Hiller Ln
Hillcrest Rd
Old Arcata Rd
Tuttle Ln
Hiller Ln
Hemlett Rd
S Quarry Rd
Nature Ln
Forde Hill Rd
Jacoby Creek Rd
Greenwood Heights Dr
Redmond Rd
Quail Valley Rd
Devoy Rd
Robinson Rd
Ole Hanson Rd
Tobacco Rd
Old Arcata Rd
Lake Ln
Vance Ave
New Navy Base Rd
State Hwy 255
Vigo St
W Clark St
Bill St
W Harris St
Harris St
Fern St
I St
J St
P St
Union St
Broadway
Myrtle Ave
Marsh Rd
Harrison Ave
Fairway Dr
Alto Ct
Bailey St
Carlton Rd
Walnut Dr
Ralphs Ct
Shelly Rd
South Bay Rd
Vista Rd
Bertas Rd
Zanes Rd
Wildwood Rd
Pleasant Point Rd
Waddington Rd
Rosemary Ave
Wyllman Ln
Cedar St
Kelly Ln
Lindsay Ln
Mitchell Heights Dr
Fickle Hill Rd
Foster Rd
Steele Ln
Freil Rd
Jennings Rd
Pierson Rd
Fickle Hill

Figure IV.8-2 Eureka Plain Planning Unit



CWPP - Community Identified Protection, Values/Assets, & Risks/Hazards



Legend

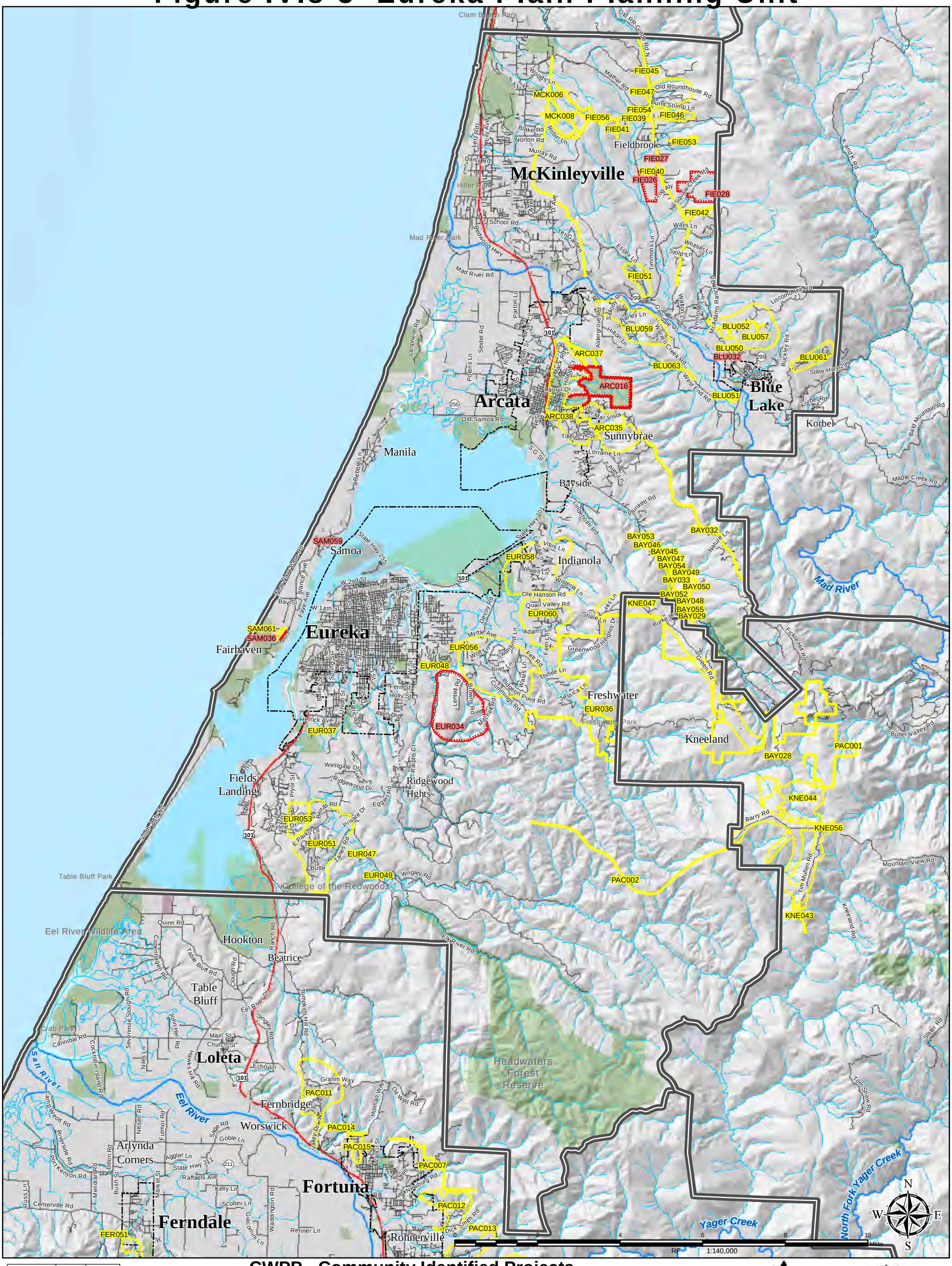
- CWPP PlanningUnit Boundary
- **Community Identified Features**
  - Protection/Evacuation
  - Value/Asset
  - Risk/Hazard
- **Land Ownership**
  - Parks/Public Land
  - Reservation/Tribal Land
  - Cities
- **Highways and Roads**
  - HWY 101
  - State HWY
  - HWY or Secondary Road
  - Local Road or Street
- **Hydrography**
  - Major River or Stream
  - Perennial Stream
  - Intermittent Stream

Land ownership and infrastructure data has been compiled by The County of Humboldt. Fire planning features identified at community workshops by residents; local, state, and federal fire service personnel; and Humboldt County staff. Other data sources were the 2006 Humboldt County Master Fire Protection Plan

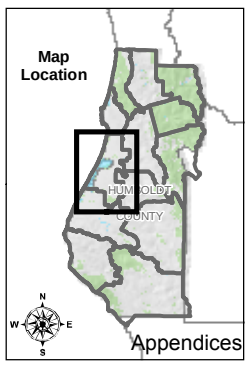
This map is intended for planning purposes and should not be used for precise measurement or navigation.

Map compiled by County of Humboldt, March 2013
Online maps visit: http://gis.humboldt.ca.us
Contact: cimmit@co.humboldt.ca.us or jvondohlen@co.humboldt.ca.us

Figure IV.8-3 Eureka Plain Planning Unit



CWPP - Community Identified Projects



Legend

- CWPP Planning Unit Boundary
- **Community Identified Projects**
  - Proposed Project
  - Treated Project
- **Land Ownership**
  - Parks/Public Land
  - Reservation/Tribal Land
  - Cities
- **Highways and Roads**
  - HWY 101
  - State HWY
  - HWY or Secondary Road
  - Local Road or Street
- **Hydrography**
  - Major River or Stream
  - Perennial Stream
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Map compiled by County of Humboldt, March 2013.
Online maps visit: http://gis.ncrmboldt.ca.us
Contact: cimmit@co.humboldt.ca.us or jvondohlen@co.humboldt.ca.us

IV.9. Kneeland-Maple Creek Planning Unit Action Plan

IV.9.1. Kneeland-Maple Creek Planning Unit Description

The Kneeland-Maple Creek *Planning Unit* encompasses 123,233 acres situated in the geographic center of Humboldt County. The Unit lies east of Eureka and the Headwaters Forest Reserve, west of Six Rivers National Forest, with the City of Blue Lake located to the north, and Highway 36 to the south. Kneeland Road, Greenwood Heights Drive, and Fickle Hill Road are the primary transportation routes within this Unit, although Maple Creek and Butler Roads are important routes as well. The Mad River is the central waterway, entering the Unit from the southwest and flowing north towards Arcata, where it meets the Pacific Ocean. Other water bodies include: Maple Creek in the northern Unit area, Lawrence Creek in the southwestern portion, and the North Fork of Yager Creek in the southern region.

All residences in this Unit exist within the *wildland-urban interface* (WUI). Kneeland and Maple Creek comprise the main communities in this Unit, however, residential properties are also scattered throughout the entire region. The majority of these rural homesteads and neighborhoods are located near Maple Creek, along Kneeland Road, and densely clustered along Greenwood Heights Drive. A small but dense neighborhood also exists along Tim Mullen Road, which branches off of Kneeland Road., en route to Bridgeville. Private land is the dominant ownership pattern; the Unit largely contains residential parcels, a few tracts of ranchland, and industrially owned timberlands to the north and south. A few parcels of Bureau of Land Management (BLM) land are distributed throughout the area, and a large section of the eastern portion of the Unit falls within Six Rivers National Forest territory. A map of this planning unit can be viewed in Figure IV.9-1. Kneeland-Maple Creek Unit: CWPP Unit Map.

IV.9.2. Kneeland-Maple Creek Community Process Summary

An open-house community workshop was held on June 4, 2012 at Kneeland Elementary School for the purpose of gathering local information and garnering public input regarding various factors contributing to the extent of wildfire risk and/or preparedness among the communities in this Unit, and to provide information about the countywide *community wildfire protection plan* (CWPP) update process. Target communities were Kneeland and Maple Creek, but only Kneeland residents were present at the meeting. Although the meeting was lightly attended, some key players participated. Among them were the Fire Chief of Kneeland Volunteer Fire Department, as well as active volunteer firefighters, and one retired volunteer firefighter. The principal of Kneeland School was also in attendance. A group exercise, which involved maps of the Planning Unit area, invited those present to help identify and pinpoint on the map where particular *fire hazards* exist, the location of *protection resources*, such as fire water drafting sites, as well as values and *assets at risk* within the community that could be threatened by wildfire.

Participants were also asked to review pre-existing information illustrated on the maps which had been added by community members during similar workshops that took place during the initial planning process in 2006. This workshop and mapping exercise also facilitated discussion among community members about potential actions that could be taken to reduce fire risk in their community. Through discussion and collaborative processes, participants identified major hazard areas and compiled lists of project proposals for enhancing their community's fire preparedness.

The community-identified fire hazards, protection resources, and values and assets at risk discussed throughout the following sections of this Planning Unit Action Plan reflect information generated by these community workshop mapping exercises, as well as information resulting from direct outreach to local fire departments and residents.

The project proposals resulting from community member discussions are contained in section IV.9.8. Community-Identified Projects in this Planning Unit Action Plan.

IV.9.3. Kneeland-Maple Creek Wildfire Environment

The majority (65%) of the Kneeland-Maple Creek Planning Unit is zoned "Very High *Fire Hazard Severity*," with 35% of the Unit area, particularly in the southern region of the Unit, zoned "High Fire Hazard Severity," as determined by the California Department of Forestry and Fire Protection (CAL FIRE). [1] The terrain in this Unit is mostly mountainous, with steep canyons and elevations ranging from. The Unit is characterized by warm summers with periodic rainfall and cool, wet winters. Most of the Unit area is heavily forested, with *stand compositions* including Douglas fir, redwoods, oak varieties, willows, big leaf maple, and white and red alders.

Traditionally, fire was an integral part of the *ecosystems* in this region. Forest management by indigenous tribes often included low-intensity, intentional burns that helped enhance forest ecosystems and prevent the accumulation of high *fuel loads*. Some of the early agricultural settlers in the late 1800s used intentional burning to clear and maintain grasslands for pasture animals. A heavy *fire suppression* campaign beginning in the 1930s has allowed the accumulation of dense, flammable vegetation in forest *understories*, which acts as *fuel* and increases the risk of high-intensity wildfires. Forest ecosystems, accustomed to low-intensity fires that would burn off *brush* and newer starts in the understory, become threatened by overcrowded forests and accumulated fuels. Intense timber harvests during the 20th century further exacerbated damages to forest ecosystem health. The extent that the *landscape* has been altered as a result of fire suppression is reflected in the *condition class* of the Unit area. Condition class describes the degree of departure from the historical *natural fire regime*. Where the condition class indicates that fire has been absent for an unnaturally long time, the hazard and potential damages are high to both the environment and human developments in the area. Approximately 49% of the Kneeland-Maple Creek Planning Unit is condition class 3, meaning the fire regime is significantly altered from the historical range; and approximately 20% of the area is condition class 2, or moderately altered from the historical range.

Despite its high fire hazard rating, recent fire events have been limited to a few blazes and contained to a small range. Major fires between the years 2000-2010 included only the Kneeland Fire in 2009, which burned 26 acres, and the Iaqua Fire in October 2009, which burned 170 acres.

Humans are the most likely *ignition source* for fires in this Planning Unit. Vehicle accidents, poorly maintained burn piles and campfires, equipment use, and incendiary burning are all potential causes. There has been a recurring problem of stolen or abandoned vehicles being torched in areas along Kneeland Road during the time school graduations happen, which often correlates with the beginning of *fire season*. Lightning and downed power lines are other potential ignition sources within this Unit.

Homes in this Planning Unit exist within the WUI, which increases the likelihood that *wildland fires* will become *structural fires*, and vice versa. *Dead plant matter* and vegetation with low *moisture levels* within 100-150 feet of homesteads pose some of the greatest threats to *structural ignitability*. Of particular concern are houses with needles and leaves accumulating on rooftops or in rain gutters. Houses with wooden rooftops and siding add to this risk, as do the presence of wooden decks, particularly those with dead plant matter accumulated beneath them. Although residential properties tend to be located on more gentle terrain, some homes are surrounded by steep slopes that can limit their defensible space and put structures in the line of up-hill spreading wildfires. Figure IV.9-2 found at the end of this Unit Action Plan illustrates risks and hazards identified by community members at public workshops and can be used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt County Web GIS Portal, "Fire Planning" section: http://gis.co.humboldt.ca.us/.

[1] CAL FIRE. (2007). *Fire Resources Assessment Program (FRAP).* [Map showing Fire Hazard Severity Zone ratings within various geographic areas, mapped by county]. Fire Hazard Severity Zones Map. Retrieved from http://frap.cdf.ca.gov/

Kneeland Road, Greenwood Heights Drive, Fickle Hill Road, and Maple Creek Road, are the primary *ingress and egress* routes, with a few smaller roads connecting residences and neighborhoods to the main roads. The main roads are somewhat interconnected, though remote, and all of them are windy and narrow in parts. The narrowness of these roads could create serious complications for emergency vehicle response trying to gain access during simultaneous home evacuations. Overgrowth of vegetation along roads and driveway and inadequate vehicle *turn around spaces* could create problems as well. Poor or complete lack of *signage* at roads and intersections pose potential problems for emergency ingress and egress. The potential for landslides could also inhibit access throughout the Unit.

Communities in this Planning Unit are not served by any community service districts, so residents obtain water through other means, such as drawing from nearby creeks and holding tanks. A number of water tanks located throughout the community are available for *fire protection water*. Community members identified four 2,500-3,000 gallon tanks, a 15,000 gallon tank, a 20,000 gallon tank, and a 30,000 gallon tank that could be made available for use by firefighters. Fire protection water may also be drawn from the following sites:

- A ½-acre pond – helicopter accessible
- Barry Road pond "B" – helicopter accessible
- A 1/4-acre pond - helicopter accessible
- Barry Road pond "C" – helicopter accessible

The map in Figure IV.9-2 at the end of this Unit Action Plan illustrates these *drafting sites* as well as other community-identified wildfire *protection resources*. The map can be used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt County Web GIS Portal, "Fire Planning" section: http://gis.co.humboldt.ca.us/.

IV.9.4. Kneeland-Maple Creek Values and Assets at Risk

Assets at risk can be defined as those things that are important to quality of life that can be threatened with destruction or loss from wildfire. These may include community assets such as homes and businesses, as well as environmental values such as wildlife habitat, natural resources, and air quality, along with any other important attribute that individual communities rely on for their well being. Loss or damage to community assets as a result of wildfire can have short- or long-term impacts of varying severity, depending on the asset. Short-term loss caused by a wildfire can include the destruction of residences, commercial assets, timber, wildlife habitat, scenic vistas, and *watersheds*. Long-term effects may include displaced persons, smaller timber harvests, reduced access to affected recreational areas, and destruction of cultural, ecological, and economic resources, and community infrastructure.

Assets at risk in this Planning Unit mainly include residential homes and neighborhood areas, as well as infrastructure components such as communication towers, power lines, and *access roads*. Many residents in these communities possess large farm animals and these, along with their associated structures, such as barns and stables, are considered assets at risk as well.

The map in Figure IV.9-2 found at the end of this Unit Action Plan illustrates values and assets at risk to wildfire identified by community members at public workshops. The map can be used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt County Web GIS[2] Portal, "Fire Planning" section: http://gis.co.humboldt.ca.us/. Some of the community-identified assets at risk within this Unit include:

- Kneeland School
- CDF Station/Airport/Heliport/rare
- Maple Creek School/Fire Station
- Maple Creek swimming

[2] Geographic Information Systems (GIS).

plant species
- Greenwood Heights/old Post Office building
- hole/recreation
- Blue Slide Church Camp

Environmentally significant assets at risk within this Planning Unit include the Iaqua Buttes, a *viewshed* with great ecological importance to the community, as well as timber resources located between Old Arcata Road and Fickle Hill Road.

IV.9.5. Kneeland-Maple Creek Community Preparedness

No local *fire safe councils* (FSC) exist in this Planning Unit and none of the communities has yet achieved national *Firewise* recognition. However, during the community outreach process, there was notable interest expressed among several Kneeland residents in the possibility of forming a local FSC and pursuing Firewise recognition for their community.

IV.9.6. Kneeland-Maple Creek Wildfire Protection Capabilities

Community fire protection within the Unit is provided by the Kneeland *Fire Protection District* (KFPD), which was established in 1990 and is served by the Kneeland *Volunteer Fire Department* (KVFD). The KVFD serves approximately 42 square miles; the out of district *response area* consists of buffer zones surrounding Freshwater, Maple Creek, Butler Valley Road, Fickle Hill Road, Bridgeville, and Showers Pass.[3] The KVFD has eight volunteer firefighters who provide fire protection and medical services to these communities. Their *apparatuses* include: one 800 gallon type-1 engine, one 300 gallon type-4 quick attack engine, and one 2,200 gallon *water tender*. [4] The KVFD can be reached by calling (707) 442-3252, or by visiting their website at: www.kneelandfire.org.

CAL FIRE is responsible for responding to wildland fires in the Unit. However, the KFPD has formal *mutual aid agreements* with CAL FIRE, Humboldt Fire District and Arcata Fire Protection Districts for giving and receiving additional assistance. Due to the remoteness of the area, the KVFD is often the first to respond to wildfires; however, volunteers' equipment and training experience limits their ability to contain large wildfires. In these instances, volunteer firefighters prioritize the protection of lives and structures while doing what they can to address the fire until assistance from CAL FIRE arrives.

The volunteer fire department in Maple Creek recently had to close due to insufficient funding. Now the community relies on seasonal wildfire response from CAL FIRE and the *goodwill service* of fire protection resources in neighboring communities, such as the Kneeland and Blue Lake.

Many communities in this Unit have various needs associated with improving the availability of emergency water for wildfire protection. Many existing water sources are in need of maintenance, protection, or improvements. There is also a need to make the location of existing water sources more apparent to firefighters with visible markers, and for community members to ensure that their water sources are properly outfitted for firefighting equipment. The KFPD is also in the process of building a new fire station which will also serve as the Kneeland Community Center. There is always a need for additional funding to support this endeavor.

[3] Kneeland Fire Protection District. (2011). *About Us.* Retrieved from http://www.kneelandfire.org/about-us.html

[4]County of Humboldt, Natural Resources Planning. (2012). *Humboldt County Fire Chiefs Association Annual Report, 2010*. Humboldt County Fire Safe Council. Retrieved from http://www.co.humboldt.ca.us/natural-resources/fire_safe_council/fireserviceannualreport.aspx

IV.9.7. Kneeland-Maple Creek Evacuation

Evacuation from the Kneeland-Maple Creek Planning Unit will travel northwest along either Kneeland Road, Greenwood Heights drive, or Fickle Hill Road towards Arcata, or it will travel south along Kneeland Road towards Bridgeville, depending on law enforcement recommendations based on *fire behavior*, wind pattern, traffic, and ingress of emergency vehicles. There are a number of smaller roads connecting residences and neighborhoods to these primary transportation routes. Barry, Paddock, and Tim Mullen Roads connect several neighborhoods to Kneeland Road, while Mountain View Road provides an alternative route south from Kneeland Road. Butler Valley Road is necessary for connecting Maple Creek to the main roads leading west, while Maple Creek Road provides northern access to Blue Lake, approximately nine miles away. Powerline Road could potentially enable eastern access, with assistance and permission from the U.S. Forest Service.

Evacuation impediments may include: landslides, fallen trees, downed power lines, overgrown vegetation, poorly marked streets and intersections, and narrow roads with few turnouts that could cause difficulty for evacuation and emergency response vehicles operating simultaneously.

During wildfire events that have the potential to threaten personal safety, community evacuation sites may be established where residents can go to survive a wildfire. Evacuation sites will be established in different locations depending on the anticipated path of the wildfire. The determination for the location of these sites is normally made by Humboldt County Emergency Operations Center Incident Commander in cooperation with an *Incident Management Team*. The Humboldt County Sheriffs and Emergency Officials will use mass communication and door-to-door methods to inform residents about the threat and where residents should go to take shelter.

If a catastrophic event occurs, residents may not be able to reach designated evacuation sites. In such cases, residents may need to make decisions on their own about seeking shelter where they can survive the passage of the wildfire until they can reach an evacuation site. It can be very difficult to determine the right thing to do as the fire approaches. Before a wildfire threatens, community members should talk to their local fire department about evacuation procedures in their neighborhood.

See section V.2.3 in Part V. Fire-Safe Communities for more information on preparing for safe evacuation and evacuation planning for pets and livestock. Also see section II.3.5 Evacuation Routes and Vulnerability in Part II. Risk Assessment for information about evacuation procedures and challenges in Humboldt County.

IV.9.8. Kneeland-Maple Creek Community Identified Potential Projects

The following list and matrix includes community identified proposed projects based on input from the community processes discussed above. A detailed description of each heading in the matrix can be found in Appendix G: Descriptive Characteristics for Community Identified Projects Matrix. These projects are illustrated on the community-identified projects map found at the end of this Unit Action Plan (Figure IV.9-3). Projects include those carried over from the 2006 fire-planning process and those identified and refined during the 2012 CWPP update process. This information can also be viewed on the fire planning GIS Portal. The GIS Portal allows users to search for and view specific fire planning features by location or to zoom into a desired area from an aerial view. To access the Portal, go to: http://gis.co.humboldt.ca.us/ and choose “Fire Planning” from the list of mapping applications. The data collected through this Planning process are included in the GIS layers within the Portal.

No vegetation *treatments* recommended in this plan will be carried out without the consent and involvement of the property owner and all applicable local, state and federal regulations must be observed.

Non-geographic community identified proposed projects based on community workshop notes:

- Improve signage—home addresses and road names.
- Build a Fire House/Community Center for Kneeland.
- Start a local Fire Safe Council or Firewise Board.
- Hold a "Firewise Recognition Workshop"; conjoin Firewise Day with community's annual music festival.
- Conduct a *Fuel Reduction* AND *Slash* Collection weekend event; inquire into Humboldt Redwood Company as a possible funding source.
- Translate the fire department's hand-written maps of area into a more sophisticated, bound and laminated map book for emergency responders.
- Implement the *Blue Dot Program*; collaborate with and educate community members regarding this.

Humboldt County Community Wildfire Protection Plan

LOCATION		Treatment/Project Information Eel Fire Planning Unit							
Number Corresponds with location on map	Community, Structure, or Area (Value at Risk)	Description	Status	Year	Type	Acres	Veg Type	Maintenance (actual or proposed)	Funding source (actual or proposed)
BAY028	Kneeland Rd & Butler Valley Rd	Water tanks at Kneeland Rd & Butler Valley Rd; 20-30k gal	Action Need	2010	Other - Water				grant - fire dept.
BAY029	Upper Jacoby Creek	Upper Jacoby Creek: water tank network	Action Need	2012	Other - Water				grant - fire dept.
BAY032	Fickle Hill Road	Fickle Hill shaded fuelbreak	Treat-Med	2012	Landscape				grant-landowner-Assn.
KNE043	Community of Kneeland	Tim Mullen Rd/Foss Rd shaded fuelbreak	Treat-High		Roadside Clearance				grant - landowner
KNE044	Community of Kneeland	ID shaded fuelbreak in upper Freshwater area and fuel reduction	Treat-High		Landscape				grant-landowner-Assn.
KNE047	Greenwood Heights Drive	Greenwood Heights Dr./Freshwater Rd: maintain defensible spaces, maintain buffers near roads and between grass and tree lines, and improve access clearance.	Treat-Med	2012	Defensible Space and Roadside Clearance and Other - Access				grant-landowner-Assn.

Humboldt County Community Wildfire Protection Plan

LOCATION		Treatment/Project Information Eel Fire Planning Unit							
Number Corresponds with location on map	**Community, Structure, or Area (Value at Risk)**	**Description**	**Status**	**Year**	**Type**	**Acres**	**Veg Type**	**Maintenance (actual or proposed)**	**Funding source (actual or proposed)**
KNE056	Barry and Tim Mullen's Road, Kneeland	Clear brush and mow grass along roads (buffers), people's driveways, homes			Defensible Space and Roadside Clearance				
PAC001	Northern boundary Humboldt Redwood company lands; Freshwater-Kneeland area	WUI; possible shaded fuelbreak	Treat-Med		Landscape				grant-landowner-Assn.
PAC002	04N 01E SEC's 21,22,26,25 & 04N 02E SEC 19	Fire Suppression Ridges on Humboldt Redwood Company Property; some natural break; targeted for additional treatment	Treat-Med		Landscape				grant-landowner-Assn.

IV.9.9. Kneeland-Maple Creek Action Plan

The following items are the initial priorities for community action for the Kneeland-Maple Creek Planning Unit as recommended by this Humboldt County CWPP (not listed in order of priority). In an ideal world, everything recommended here would be implemented. However, it must be understood that implementation will be subject to the availability of funds and other resources and the willingness/ability of community members and Plan Partners to take action. This Action Plan can be cited in grant applications to leverage needed implementation funds and used to guide and inspire action.

Enhancing Fire Protection

- **Sustainable Fire Departments:** Community members within this Planning Unit should support their local fire department[5] through activities such as volunteering as firefighters or auxiliary members, making donations, supporting fundraisers, writing grants, and/or helping with administrative tasks. With community support, local fire departments can continue to provide a wide variety of vital emergency services.
    - Complete construction of the new Kneeland Fire Hall and Community Center.
    - Explore potential options for providing local fire protection to the community of Maple Creek. This may include expanding the Kneeland Fire Protection district Boundary to include the community of Maple Creek. This Plan recommends that voter approval of a special tax or assessment accompany any expansion so that the fire service is financially supported.
- **Signage:** To aid emergency responders, residents and road associations should improve road and address signage throughout their communities. Make signs larger and reflective to increase visibility and install road and address signs where they are missing. Less noticeable but more sentimental address signs may remain but it is important to also post reflective signs with lettering at least three inches in height.
- **Firefighting Water:** Increase the availability of water for fire protection by making water access locations known to fire departments and investing in more community water tanks. Neighborhood and road associations and/or Firewise Communities work with local fire departments to develop a "Blue Dot" program, which identifies the location of firefighting water sources by marking them with a blue reflective dot. This program also ensures that tanks and water systems are outfitted with fittings compatible with firefighting equipment. Begin by identifying where such a program is most needed. Focus initial efforts in the following neighborhood areas:
    - Kneeland Road
    - Butler Valley Road
    - Upper Jacoby Creek Road

Creating Fire Safe Communities

- **Firewise Communities:** Pursue participation in the Firewise Communities/USA recognition program for the community of Kneeland within the Kneeland Fire Protection District boundaries. Focus particular attention on neighborhoods located along dead-end roads. Actively implement and maintain the Firewise action plan on an annual schedule.

Preparing for Emergencies

- **Community Emergency Response Teams:** Organize a *Community Emergency Response Teams* (CERT) training session for residents interested in improving the community's emergency preparedness. These training opportunities equip community members with basic disaster response skills for dealing with a variety of emergency situations. Such skills become extremely valuable in situations where professional responders cannot act immediately. CERT participants gain experience implementing collaborative problem solving and develop a greater sense of community cohesion. It is particularly important to build

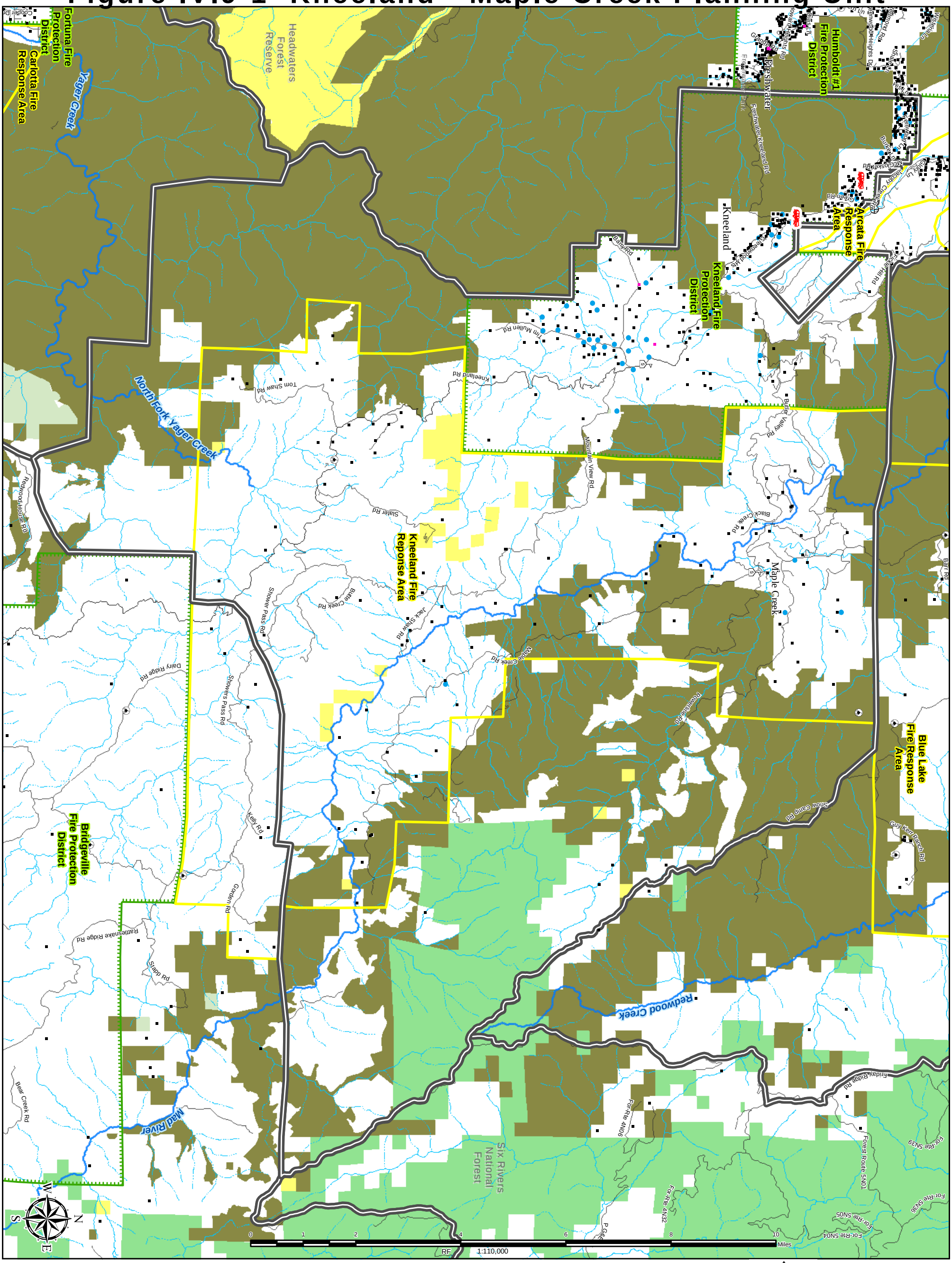
[5] *All local fire departments within this unit are listed above with their contact information in the "Wildfire Protection Capabilities" section.*

this community capacity because Kneeland has the potential for being cut off from larger community centers during an extreme wildfire or earthquake event.

Reducing Wildfire Fuels (Flammable Vegetation)

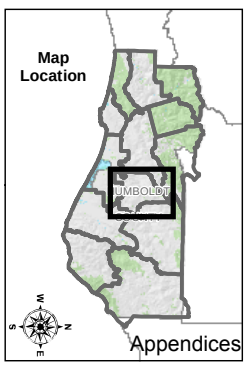
- **Defensible Space:** All residents in this Planning Unit live within the WUI and are at risk to wildfire; therefore, residents should manage the flammable vegetation within their *home ignition zone*. Maintaining *defensible space* through vegetation treatments should be a routine and ongoing practice for all homes and landscapes. Community *Chipper Days* can facilitate this process by helping landowners get rid of slash and brush piles so that they do not become an additional hazard. Begin by identifying where defensible space is most needed within the planning unit. The following priority areas were identified at community meetings and are recommended for treatment in this plan:
  - Greenwood Heights Drive
  - Barry Road
  - Tim Mullens Road
- **Roadside Clearance:** Manage roadside vegetation in order to improve and maintain access for emergency vehicles and ensure safe evacuation. Consider working with the California Conservation Corps or County Public Works Roads Division. Focus initial efforts along the following roads:
  - Tim Mullens Road
  - Foss Road
  - Shaded fuelbreak where needed on upper Fickle Hill Road.
  - Shaded fuelbreak in upper Freshwater area, along Kneeland Road.
- **Landscape Fuels Reduction:** Construct *shaded fuelbreaks* as buffers between residential areas and wildlands to slow the progress of wildfires. This allows firefighters a higher probability of successfully protecting communities from wildfire damage. These buffers may also protect the wildlands from the spread of fires originating within communities. The following areas are recommended for priority treatment in this plan:
  - Vegetation treatment on fire suppression ridges.
  - Shaded fuelbreak near northern Humboldt Redwood Lumber Company boundary, near Freshwater and Kneeland Road.

Figure IV.9-1 Kneeland - Maple Creek Planning Unit



CWPP Unit Map

Map Location



Legend

CWPP Planning Unit Boundary

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

Local Fire Organization Response Area
- District
- Out of District
- Non-Tax (Volunteer Fire Company (VFC))
- Proposed District Annexation Area (PDAA)

Improved Parcels
- Improved Parcel (not actual location of improvement)
- Commercial or Industrial Lot (not actual location)

Airports
- Landing Strip

Highways and Roads
- HWY 101
- State HWY
- HWY or Secondary Road
- Local Road or Street

Hydrography
- Major River or Stream

Infrastructure
- Gauging Station
- Water Tank or Source
- Historic Locations

Land Ownership

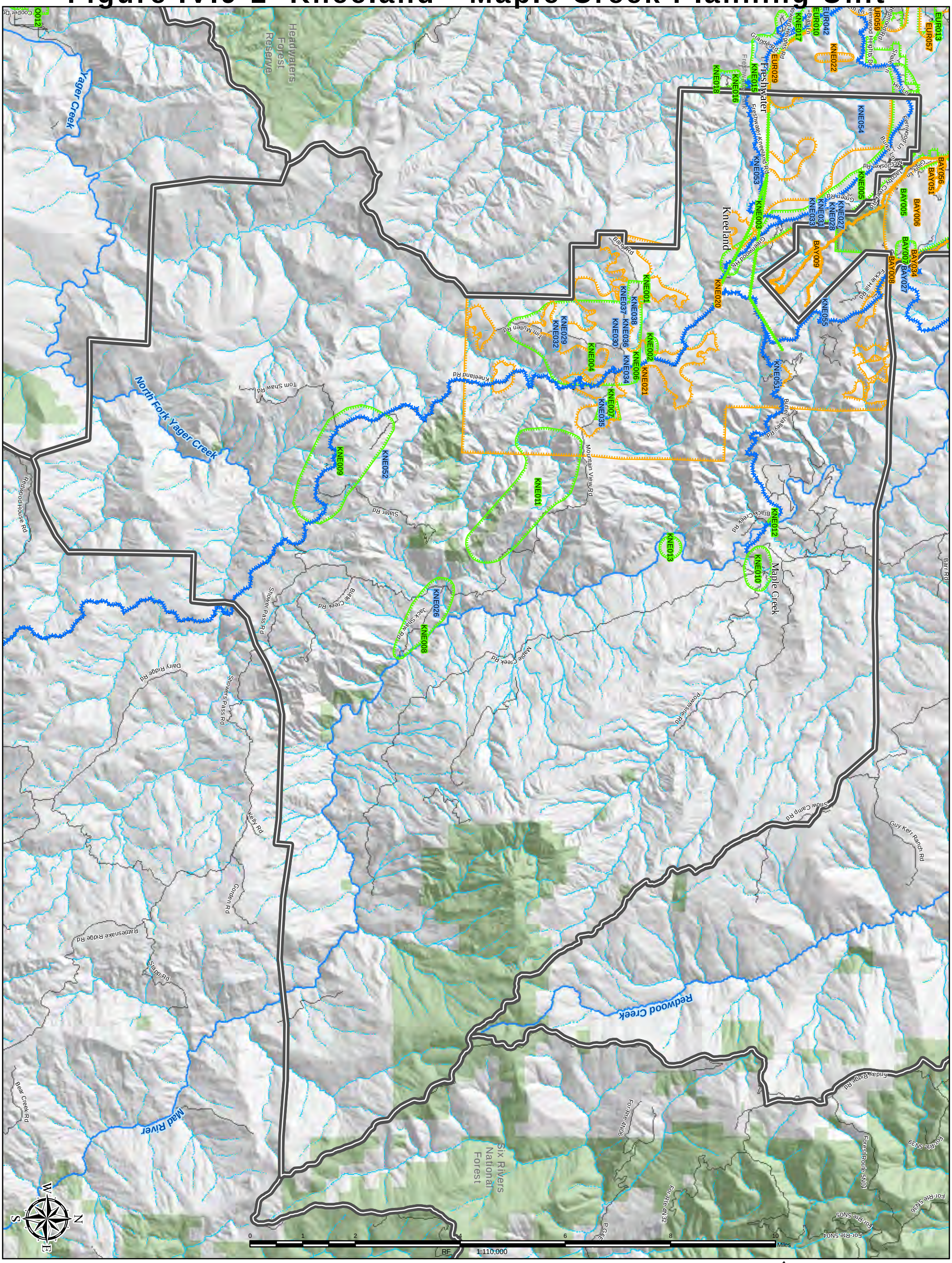
AGENCY
- Bureau of Land Management
- National Park Service
- State Park or Other State Lands
- Six Rivers National Forest
- U.S. Fish and Wildlife Service
- Tribal Lands
- Private
- Industrial Timber
- Cities

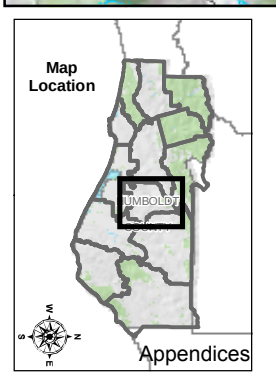
Land ownership and infrastructure data has been compiled by The County of Humboldt. Fire planning features identified at community workshops by residents; local, state, and federal fire service personnel; and Humboldt County staff. Other data sources were the 2006 Humboldt County Master Fire Protection Plan

This map is intended for planning purposes and should not be used for precise measurement or navigation.

Map compiled by County of Humboldt, March 2013.
Online maps visit: http://gis.ccpfirehumboldt.ca.us
Contact: cimmit@co.humboldt.ca.us or jvondohlen@co.humboldt.ca.us

Figure IV.9-2 Kneeland - Maple Creek Planning Unit





CWPP - Community Identified Protection, Values/Assets, & Risks/Hazards

Legend

- CWPP Planning Unit Boundary
- Parks/Public Land
- Cities

Community Identified Features

- Protection/Evacuation
- Value/Asset
- Risk/Hazard

Highways and Roads

- HWY 101
- State HWY
- HWY or Secondary Road
- Local Road or Street

Hydrography

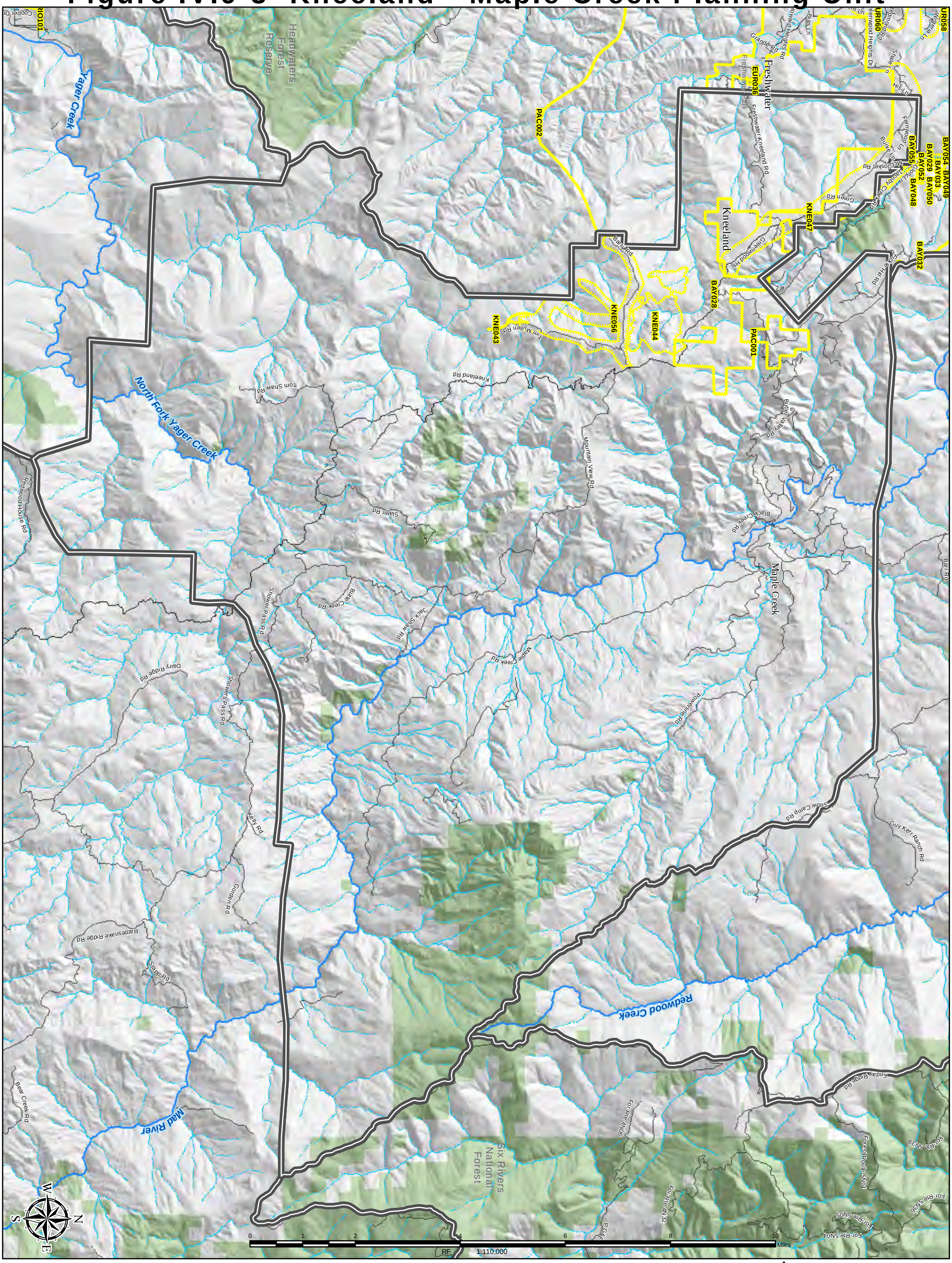
- Major River or Stream
- Perennial Stream
- Intermittent Stream

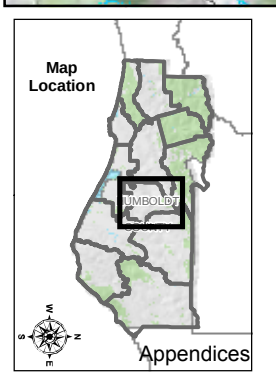
Land ownership and infrastructure data has been compiled by The County of Humboldt. Fire planning features identified at community workshops by residents; local, state, and federal fire service personnel; and Humboldt County staff. Other data sources were the 2006 Humboldt County Master Fire Protection Plan

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Contact: cimmit@co.humboldt.ca.us or jvondohlen@co.humboldt.ca.us

Figure IV.9-3 Kneeland - Maple Creek Planning Unit





CWPP - Community Identified Projects

Legend

- CWPP Planning Unit Boundary
- Parks/Public Land
- Cities

Community Identified Projects

- Proposed Project
- Treated Project

Highways and Roads

- HWY 101
- State HWY
- HWY or Secondary Road
- Local Road or Street

Hydrography

- Major River or Stream
- Perennial Stream
- Intermittent Stream

Land ownership and infrastructure data has been compiled by The County of Humboldt. Fire planning features identified at community workshops by residents; local, state, and federal fire service personnel; and Humboldt County staff. Other data sources were the 2006 Humboldt County Master Fire Protection Plan

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Map compiled by County of Humboldt, March 2013
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Contact: cimmit@co.humboldt.ca.us or jvondohlen@co.humboldt.ca.us

IV.10. Eel Planning Unit Action Plan

IV.10.1. Eel Planning Unit Description

The Eel *Planning Unit* encompasses 222,623 acres situated in the south-western portion of Humboldt County; it is located south of Humboldt Bay and the Headwaters Forest Reserve, and west of the town of Bridgeville, with the southern edge of the Unit bordering Humboldt Redwoods State Park. This Unit contains some of the more populated areas of Humboldt County, apart from the Greater Eureka Area. Highway 101 is the central transportation route, entering from the south-east corner and traveling in a north-westerly direction through the Planning Unit. Highway 36 is another major route that heads east out of the Unit towards Trinity County. The geography of the Unit is dominated by the lower portion of the Eel River *basin* and its *tributary watersheds*. A major confluence of primary waterways and transportation routes takes place just south of Fortuna near the community of Alton: the Eel River, which is paralleled by Highway 101, is joined by the Van Duzen River, which is paralleled by Highway 36. Major Eel River tributaries within the Unit include: Yager Creek, Home Creek, Price Creek, and Strongs Creek.

The City of Fortuna, known as the "Friendly City," and the City of Rio Dell comprise the community population centers of this Planning Unit. The rural City of Ferndale is another yet smaller population center within this Unit. Located directly west of Fortuna, Ferndale is accessed via Highway 211, which leads into the heart of Ferndale, where numerous smaller roads branch out into various neighborhoods. Several other towns and communities are clustered along Highway 101, including the town of Loleta to the north, and the town of Alton, in between Fortuna and Rio Dell, as well as Carlotta and Hydesville located to the east along Highway 36. The communities of Scotia, Stafford, Holmes, Pepperwood and Redcrest are located south of Rio Dell.

Private land is the prevailing ownership pattern within this Planning Unit. Rural-residential parcels dominate the areas surrounding Fortuna and Ferndale, with dense clusters development amassed around the main roads and community centers, while most of the southwestern Unit area is comprised of large ranchlands, with properties dispersed more widely. Rio Dell and the communities to the south are surrounded by land managed primarily by Humboldt Redwood Company, along with some parcels owned by Green Diamond Resource Company and other timber industries. Agriculture and timber production are the primary industries within this Planning Unit. A small portion of the famous Avenue of the Giants (also known as Highway 254) lies between the towns of Redcrest and Pepperwood, featuring some of the most breathtaking old growth redwoods still in existence today. A map of this planning unit can be viewed in Figure IV.10-1: Eel Unit: CWPP Unit Map at the end of this document.

IV.10.2. Eel Community Process Summary

Two community workshops were held within this Planning Unit for the purpose of gathering local information and garnering public input regarding various factors contributing to the extent of wildfire risk and/or preparedness among the communities in this Unit, and to provide information about the countywide *community wildfire protection plan* (CWPP) update process. One meeting took place on April 17, 2012 in Loleta, and the other was held on June 28, 2012 in Fortuna. These meetings were sparsely attended. A group exercise, which involved maps of the Planning Unit area, invited those present to help identify and pinpoint on the map where particular *fire hazards* exist, the location of *protection resources*, such as fire water drafting sites, as well as values and *assets at risk* within the community that could be threatened by wildfire. These workshop processes also provided an opportunity for participating community members to ask questions and provide information based on their local knowledge.

Participants were also asked to review pre-existing information illustrated on the maps which had been added by community members during similar workshops that took place during the

initial planning process in 2006. These workshops and mapping exercises also facilitated discussion among community members about potential actions that could be taken to reduce fire risk in their communities. Through discussion and collaborative processes, participants identified major hazard areas and compiled lists of project proposals for enhancing their communities' fire preparedness.

The community-identified fire hazards, protection resources, and values and assets at risk discussed throughout the following sections of this Planning Unit Action Plan reflect information generated by these community workshop mapping exercises, as well as information resulting from direct outreach to local fire departments and residents.

The project proposals resulting from community member discussions are contained in section IV.10.8. Community-Identified Projects in this Planning Unit Action Plan.

IV.10.3. Eel Wildfire Environment

The majority of the Eel Planning Unit (72%) is zoned "High *Fire Hazard Severity*," as determined by CAL FIRE.[1] However, approximately 13% of the Unit area is zoned "Moderate Fire Hazard Severity," including the more populated areas surrounding towns and the main transportation corridors. A portion of the Unit, primarily land to the west of Fortuna and surrounding Ferndale, falls within *Local Responsibility Area* (LRA), which is outside of CAL FIRE's jurisdiction and is therefore not zoned for Fire Hazard Severity; this accounts for 15% of the Unit acreage. Much of the inland portion of this Unit is moderately steep and heavily forested. Areas of tidal marshland are located closer to the coast. Many flat land areas near the bay contain a mix of agricultural production and pastureland.

The Unit is characterized by a Mediterranean climate. Summer weather further inland is typically dry and hot, while the coastal areas are tempered by cool fog. Winter months feature frequent precipitation and although snowfall is a rare occurrence near the coast, it is likely at elevations of 2,500 feet and above. Local *vegetation types* include: forested areas, which are largely comprised of redwoods, mixed conifer, hardwoods, and oak woodlands; *riparian* areas, where red alder, willow, and coastal shrub species are common; and annual grasslands.[2] Agricultural crops also comprise a significant portion of vegetation within this Unit.

Traditionally, fire was an integral part of the *ecosystems* in this region. Forest management by indigenous tribes often included low-intensity, intentional burns that helped enhance forest ecosystems and prevent the accumulation of high *fuel loads*. Communities in this Planning Unit are known for having a long history of ranching and agricultural practices; some of the early settlers in the late 1800s used intentional burning to clear and then maintain grasslands for pasture animals. A heavy *fire suppression* campaign beginning in the 1940s has allowed the accumulation of dense, flammable vegetation in forest *understories*, which acts as *fuel* and increases the risk of high-intensity wildfires. Forest ecosystems, accustomed to low-intensity fires that would burn off *brush* and newer starts in the understory, become threatened by overcrowded forests and accumulated fuel. Intense timber harvests during the 20th century further exacerbated damages to forest ecosystem health.

Humans are the most likely *ignition source* for fires in this Planning Unit. Vehicle accidents, smoking, playing with fire, poorly maintained brush pile burns, and incendiary burning are just a few potential causes. Various types of equipment use and downed power lines can also be potential ignition sources. Lightning is the most probable natural cause of fire starts within this Unit.

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[1] CAL FIRE. (2007). *Fire Resources Assessment Program (FRAP).* [Map showing Fire Hazard Severity Zone ratings within various geographic areas, mapped by county]. Fire Hazard Severity Zones Map. Retrieved from http://frap.cdf.ca.gov/.

[2] Dyett & Bhatia. (2002, September). Lower Eel River Watershed..(p. 14.)

Although the majority of communities in this Unit reside within the "fog belt" and experience an abundance of precipitation, residents must not be lured into a false sense of security regarding their risk of wildfire. Many homes exist within the *wildland-urban interface* (WUI) in which *wildland fires* can easily become *structural fires*, and vice versa. *Dead plant matter* and vegetation with low *moisture levels* within 100-150 feet of homesteads pose some of the greatest threats to *structural ignitability*. Of particular concern are houses with needles and leaves accumulating on rooftops or in rain gutters. Houses with wooden rooftops and sidings add to this risk, as do the presence of wooden decks, particularly those with dead plant matter accumulated beneath them. Figure IV.10-2 found at the end of this Unit Action Plan illustrates risks and hazards identified by community members at public workshops and can be used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt Web GIS Portal, Fire Planning section: http://gis.co.humboldt.ca.us/.

Highway 101 and Highway 36 are the central *ingress and egress* routes, with numerous smaller roads connecting residences and neighborhoods to these central corridors. Poor or complete lack of *signage* at roads and intersections pose potential problems for ingress and egress; this is especially true for more remote residences that are further away from the main towns. The narrowness of smaller roads leading to remote residences could create serious complications for firefighting *apparatuses* trying to gain access during simultaneous home evacuations. Routes may also be overgrown with vegetation, and many properties have inadequate *turn around spaces*. The potential for landslides in the area could also inhibit access.

The central cities of Ferndale, Fortuna, and Rio Dell provide potable water and *fire protection water* to the majority of the population within this Unit. The City of Ferndale serves a population of approximately 1,400; The City of Fortuna serves a population of approximately 11,200; and the City of Rio Dell serves a population of approximately 3,250. The Scotia and Carlotta Community Service Districts also provide their communities with water. Residents outside of the cities and service districts obtain water through other means, such as drawing from nearby creeks and holding tanks. Fire protection water may also be drawn from the following locations:

- Bear River drafting area
- Blue Slide Road river drafting
- Dyerville river drafting
- Eel River tributaries drafting locations
- Three drafting locations on Palco Log Pond
- Elinor Flat river drafting
- Holmes river drafting area
- Price Creek drafting areas
- Shively river drafting areas
- Yager Creek
- Carlotta Mill

The map in Figure IV.10-2 found at the end of this Unit Action Plan illustrates these *drafting sites* as well as other community-identified wildfire *protection resources*. The map can be used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt Web GIS Portal, Fire Planning section: http://gis.co.humboldt.ca.us/.

IV.10.4. Eel Values and Assets at Risk

Assets at risk can be defined as those things that are important to quality of life that can be threatened with destruction or loss from wildfire. These may include community assets such as homes and businesses, as well as environmental values such as wildlife habitat, natural resources, and air quality, along with any other important attribute that individual communities rely on for their well being. Loss or damage to community assets as a result of wildfire can have short- or long-term impacts of varying severity, depending on the asset. Short-term loss caused by a wildfire can include the destruction of residences, commercial assets, timber, wildlife habitat, scenic vistas, and *watersheds*. Long-term effects may include displaced persons, smaller timber

harvests, reduced access to affected recreational areas, and destruction of cultural, ecological, and economic resources, and community infrastructure.

The majority of *assets at risk* in this Planning Unit are residential homes and communities, along with a variety of commercial and service industries, community centers, medical and dental clinics, schools, churches, museums, as well as infrastructure components, such as water treatment plants. The Bear River Casino and Rohnerville Airport are noteworthy assets as well. The ranching, agricultural, dairy, and timber industries within the Unit are also considered assets at risk. The Unit also contains a few city parks, an industrial park, and RV parks, which are scattered among the various communities.

The map in Figure IV.10-2 found at the end of this Unit Action Plan illustrates values and assets at risk to wildfire identified by community members at public workshops. The map can be used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt Web GIS[3] Portal, Fire Planning section: http://gis.co.humboldt.ca.us/. Some of the community-identified assets at risk within this Unit include:

- Mount Pierce Communications Site
- Eel River Sawmills
- Capetown Hotel
- Russ Park
- Cookhouse Ranch - historical site
- Humboldt Creamery Association

The Eel River itself is a an environmentally significant asset; it "supports the largest remaining native coho salmon population in California, as well as fall-run Chinook salmon, steelhead trout, coastal cutthroat trout, green sturgeon, and Pacific Lamprey."[4] Table Bluff County Park, located at the southwestern edge of Humboldt Bay, and Crab Park are areas of environmental importance as well. The Eel River Wildlife Area has significant ecological value, with a diverse array of *habitats* that support a bounty of wildlife, such as, "river otters, harbor seals, tundra swans, bald eagles, egrets, herons, salmon and steel head trout."[5] Other notable wildlife species within the Unit include: black tailed deer, beaver, mink, gray fox, ring tailed cats, weasels, coyote, and bobcats.[6] Just east of Table Bluff Park lies the Wiyot Reservation, a small bit of land that holds great cultural significance for many residents in this Unit.

IV.10.5. Eel Community Preparedness

No local *fire safe councils* (FSC) exist in this Planning Unit and none of these communities has achieved national *Firewise* recognition. Efforts to educate community members about fire safety and to improve emergency preparedness within this Unit are guided by the local fire protection services with some support from Humboldt County FSC. *Community Emergency Response Teams* (CERT) training took place within this Unit to equip community members with basic disaster response skills for dealing with a variety of emergency situations. Such skills become extremely valuable in situations where professional responders cannot act immediately. CERT participants gain experience implementing collaborative problem solving and develop a greater sense of community cohesion.

The Fortuna Volunteer Fire Department (VFD) provides fire prevention and safety services through their Fire Prevention Division and Public Education Division. Their efforts include implementing and maintaining community outreach programs that educate and inform the public

[3] Geographic Information Systems (GIS).

[4] Dyett & Bhatia. (2002, September). Lower Eel River Watershed. *Humboldt 2025 General Plan Update: Natural Resources and Hazards; Vol. 2: Detailed Watershed Characteristics and Regulatory Framework Analysis.* Retrieved from http://www.co.humboldt.ca.us/gpu/documentsbackground.aspx.

[5] The Wildlands Conservancy. (2012). *Eel River Estuary Preserve*. Retrieved from http://www.wildlandsconservancy.org/preserve_eelriver.html.

[6] Dyett & Bhatia. (2002, September). Lower Eel River Watershed. (p.17.)

about fire prevention; in addition to giving safety presentations on a range of topics, the Fortuna VFD also distributes informational materials at local community events. The Fortuna VFD is also committed to enhancing public safety by conducting fire safety inspections at businesses, residences, schools, as well as children's day cares and senior residential care units.

IV.10.6. Eel Wildfire Protection Capabilities

Seven *volunteer fire departments* (VFDs) and *volunteer fire companies* (VFCs) collaborate to provide fire protection to the communities within the various *fire protection districts* (FPD) and *community services districts* (CSD) that exist within this Planning Unit. The seven fire chiefs from these fire departments and companies comprise the Eel River Valley Fire Chiefs group. This group meets on a quarterly basis to discuss and coordinate issues in the Eel River Valley and along Highway 36.

Tax- or fee-supported fire protection services within this Unit include: [7] [8]

- **The Loleta VFD** was formed in 1900 and has 30 volunteer firefighters who provide service to approximately 1,500 community members in 30 square miles. Their apparatuses include: a 4,000 gallon water tender, three type-2 engines, one type-3 engine, one type-4 quick-attack engine, and a rescue truck. The Loleta VFD can be reached by calling (707) 733-5407, by email at: loletafire@suddenlink.net, or by visiting their webpage at: www.loletafire.com.
- **The Ferndale VFD** was founded in 1897 and supports 34 members who provide service to approximately 2,605 community members within the district, which encompasses over 28 square miles. They also provide service to about 130 residents outside the district. Their apparatuses include: one type-1 engine, two type-2 engines, one type-4 quick-attack truck, one rescue truck, and two 5,000 gallon water tenders. The Ferndale VFD can be reached by calling (707) 786-9909, or by visiting their website at: http://www.ferndalefire.org/.
- **The Fortuna VFD** was founded in 1904 and supports 68 volunteer firefighters out of three stations. Volunteers provide service to 15,000 community members in approximately 26 square miles, including the City of Fortuna and outlying areas including Hydesville and Alton. Their apparatuses include: a 2,000 gallon water tender, a 3,000 gallon water tender, two aerial fire trucks, two type-1 engines, two type-2 engines, plus one reserve type-2 engine, a type-3 engine, and two rescue trucks. The Fortuna VFD can be reached by calling (707) 725-5021, or by visiting their website at: www.fortunafire.com.
- **The Rio Dell VFD** was founded in 1941 under the name of "Wildwood FPD," and became the "Rio Dell FPD" in 1961.[9] It supports a total of 30 members who provide service to approximately 3,300 community members within over 40 square miles. Their apparatuses include: one type-1 engine, one type-2 engine, one type-3 engine, one type-4 rescue truck, one 3,800 gallon water tender, and a Ford Expedition Incident Command vehicle. The Rio Dell VFD can be reached by calling (707) 764-3329, or by visiting their website at: www.riodellfire.com.
- **The Carlotta VFD** was formally established in 1965 and supports 12 members. Their apparatuses include: a Rapid Response 1986 GMC ¾-ton, which responds to all medical calls; a 1977 Ford Van Pelt Pumper with 850 gallons of water; a 1983 Chevy

[7] County of Humboldt, Natural Resources Planning. (2012). *Humboldt County Fire Chiefs Association Annual Report, 2010*. Humboldt County Fire Safe Council. Retrieved from http://www.co.humboldt.ca.us/natural-resources/fire_safe_council/fireserviceannualreport.aspx.

[8] Humboldt County Fire Chiefs Association. (2012). 2012 Local Fire Protection Survey.

[9] Rio Dell Volunteer Fire Department. (2012). *Homepage*. Retrieved from http://www.riodellfire.com/.

Utility Truck that carries 150 gallons of water, has foam, and carries rope rescue gear; a 1980 Ford F600 Pumper with a 550 gallon capacity; a 1977 Ford Van Pelt Pumper/Tender Combo with 2,500 gallons; and a 1971 International Tender with 3,500 gallons. The Carlotta VFD can be reached by calling (707) 768-1714 or (707) 768-1724.

There are two *volunteer fire companies* (VFC) operating in this Unit, which receive no tax-based support but rather rely solely on donations and fundraising. They include: [10]

- **The Redcrest VFC**, supports 6 volunteers who provide services to the areas of Redcrest, Holmes, Larabee, Shively, and Stafford. Their apparatuses include: one type-1 engine with a 500 gallon capacity and a 4WD Utility Truck with medical equipment. The Redcrest VFC can be reached by calling (707) 722-1967.
- **The Scotia VFC** supports 22 members who provide service to approximately 800 community members. Their apparatuses include: one type-1 engine, one type-2 engine, a medical response vehicle,, and a Chief Command Vehicle (Pickup). The Scotia VFC can be reached by calling (707) 764-4322, by email at svfdfire@gmail.com, or by visiting their website at: http://svfdfire.com/.

The fire protection service entities in this Planning Unit respond to structural fires as well as wildfires. A substantial portion of the Unit, particularly the area west of Highway 101 surrounding Ferndale, falls under the jurisdiction of LRA. The remaining area is State Responsibility Area (SRA) and is the responsibility of CAL FIRE. The CAL FIRE – Humboldt-Del Norte Unit (CAL FIRE-HUU) Administrative Headquarters is located in Fortuna and houses the primary dispatch center in Humboldt: the Fortuna Interagency Command Center. Staffing at the Fortuna CAL FIRE station varies throughout the year, but remains adequate for emergency response most of the year. CAL-FIRE HUU can be reached by calling (707) 725-4413.

Many communities in this Unit have various needs associated with improving the availability of emergency water for wildfire protection. There are some locations where firefighting water is not available or where emergency water storage is needed to supplement the potentially over taxed municipal water supply. Many existing water sources are in need of maintenance, protection, or improvements. There is also a need to make the location of existing water sources more apparent to firefighters, and for community members to ensure that their water sources are properly outfitted for fire fighting equipment.

Emergency responders in this Unit are also challenged by a lack of proper signage throughout some of the more remote neighborhoods. Poorly visible or missing signage can make it difficult for firefighters to locate incident sites and can also hinder emergency *response times*. Difficulty accessing residences is exacerbated in areas where narrow roads are grown over with vegetation and have insufficient width to accommodate firefighting apparatuses.

The fire protection entities within this Planning Unit do their best to provide their communities with fire protection as well as medical and rescue services. However, individually, these departments struggle with the man-power, time and funding to support the more specialized goal of rescue services. This is why the fire chiefs of the Van Duzen and lower Eel River Valley areas came together to form the Eel River Valley Technical Resource Team (ERVTRT), to address the many risks that these departments face (water rescue, collapse rescue, confined space rescue and more). Participating fire departments include: Bridgeville, Carlotta, Ferndale, Fortuna, Loleta, Rio Dell, and Scotia. The ultimate goal of the ERVTRT is, through the pooling of resources, to have the ability to provide a higher level of rescue operations to their communities. These operations include low angle rope rescue, hazardous materials operations level training, confined space training, rescue systems training (collapse rescue) and swift water rescue training along

[10] County of Humboldt, Natural Resources Planning. (2012). *Humboldt County Fire Chiefs Association Annual Report, 2010*.

with the acquisition of appropriate equipment to address collapse, confined space and water rescue events. The ERVTRT has approximately 15 members who train together twice monthly and have an assigned Team Leader and Squad Leaders who are in charge of members from each fire department. In November 2011, the Fire Chief's determined that the level of training and procedures for the ERVTRT were adequate and authorized the team to respond to calls.

IV.10.7. Eel Evacuation

Evacuation from the Eel Planning Unit will travel either southeast or northwest along Highway 101, or east on Highway 36, depending on law enforcement recommendations based on *fire behavior*, wind pattern, traffic, and ingress of emergency vehicles. Ferndale residents will connect to Highway 101 either by traveling north on Highway 211 or southeast on Grizzly Bluff Rd, which becomes Blue Slide Road. There are numerous small roads connecting communities and residences to main roads and highways. Adequate ingress and egress along these roads is vital to a large portion of the community that may need to access primary *evacuation routes* and for firefighters who will be using the roads to access wildfire incidents.

Evacuation impediments may include: landslides, fallen trees, overgrown vegetation, poorly marked streets and intersections, and *one-way-in, one-way-out roads* that could inhibit evacuation and emergency response vehicles, or leave residents stranded should the roads become blocked.

During wildfire events that have the potential to threaten personal safety, community evacuation sites may be established where residents can go to survive a wildfire. Evacuation sites will be established in different locations depending on the anticipated path of the wildfire. The determination for the location of these sites is normally made by Humboldt County Emergency Operations Center Incident Commander in cooperation with an *Incident Management Team*. The Humboldt County Sheriffs and Emergency Officials will use mass communication and door-to-door methods to inform residents about the threat and where residents should go to take shelter.

If a catastrophic event occurs, residents may not be able to reach designated evacuation sites. In such cases, residents may need to make decisions on their own about seeking shelter where they can survive the passage of the wildfire until they can reach an evacuation site. It can be very difficult to determine the right thing to do as the fire approaches. Before a wildfire threatens, community members should talk to their local fire department about evacuation procedures in their neighborhood.

See section V.2.3 in Part V. Fire-Safe Communities for more information on preparing for safe evacuation and evacuation planning for pets and livestock. Also see section II.3.5 Evacuation Routes and Vulnerability in Part II. Risk Assessment for information about evacuation procedures and challenges in Humboldt County.

IV.10.8. Community Identified Potential Projects

The following list and matrix includes community identified proposed projects based on input from the community processes discussed above. A detailed description of each heading in the matrix can be found in Appendix G: *Descriptive Characteristics for Community Identified Projects Matrix*. These projects are illustrated on the community-identified projects map found at the end of this Unit Action Plan (Figure IV.10-3). Projects include those carried over from the 2006 fire-planning process and those identified and refined during the 2012 CWPP update process. This information can also be viewed on the fire planning GIS Portal. The GIS Portal allows users to search for and view specific fire planning features by location or to zoom into a desired area from an aerial view. To access the Portal, go to: http://gis.co.humboldt.ca.us/ and choose "Fire Planning" from the list of mapping applications. The data collected through this Planning process are included in the GIS layers within the Portal.

No vegetation *treatments* recommended in this plan will be carried out without the consent and involvement of the property owner and all applicable local, state and federal regulations must be observed.

Non-geographic community identified proposed projects based on community workshop notes:

- Provide education and outreach about living in an area vulnerable to wildfires. Include compelling stories about past coastal wildfire events. Send this information out with various already occurring mailers.
- Post more address and road signs in some areas.
- Identify roads that are impassable with fire trucks. Ferndale is considering posting a red reflective strip at the bottom of roads that can not accommodate their fire trucks.
- Include a link to the County Fire Safe Council and State Fire Safe Council websites on all fire department websites.
- Use Facebook and other popular social networking tools to get the fire safe message out to more people.
- Encourage Boy Scouts of America to perform community service activities including delivering literature to homeowners or clearing around and painting fire hydrants.
- Partner with the California Conservation Corps to treat hazardous vegetation in priority locations.

LOCATION		Community Identified Treatment/Project Information Eel Fire Planning Unit							
Number Corresponds with location on map	Community, Structure, or Area (Value at Risk)	Description	Status	Year	Type	Acres	Veg. Type	Maintenance (actual or proposed)	Funding source (actual or proposed)
BRD020	HWY 36 east to Trinity CO line	Fuel reduction	Treat-Med	2010	Roadside Clearance				grant-landowner, neighborhood or road association
BRD035	H-Line (old PL haul road)	Fuel reduction	Treat-Med	2010	Roadside Clearance				grant-landowner, neighborhood or road association
BRD076	Cummings Creek Road	Fuel reduction	Funded	2010	Landscape				
BRD078	Fox Creek Road	Fuel reduction	Funded	2010	Landscape				
BRD082	Carlota - Church Ln (Private road) & Hwy 36	Neighborhood -combo driveway clearing, defensible space, and buffer to protect from wildland fire - Thinning Chipping	Treat-High	2009	Landscape Defensible Space				grant-landowner, neighborhood or road association
BRD089	Fox Creek Rd.	Roadside Shaded Canopy. 50 ft each side of Rd. for 2 miles -Thinning Chipping	Funded	2009	Roadside Clearance	24.00		Check re-growth every 3 years	USDA 2009 grant
BRD091	Cummings Creek Road	Roadside Shaded Canopy. 50 ft each side of Rd. for 1 mile - Thinning Chipping	Funded	2009	Roadside Clearance	12.00			USDA 2009 grant

Humboldt County Community Wildfire Protection Plan

LOCATION		Community Identified Treatment/Project Information Eel Fire Planning Unit							
Number Corresponds with location on map	Community, Structure, or Area (Value at Risk)	Description	Status	Year	Type	Acres	Veg. Type	Maintenance (actual or proposed)	Funding source (actual or proposed)
BRD107	Carlotta interface areas North hwy 36	Public outreach re defensible space and fire safety	Action-Needed	2012	Other-Ed				
FER050	Williams Ck Rd (single access), and surrounding	Roadside vegetation Management, Public outreach re defensible space, evacuation plan	Treat-Med	2012	Roadside clearance & Other Education				
FER051	Eugene St (single access), Ferndale	Public outreach re defensible space and address signage	Action-Needed	2012	Other-Education				
PAC003	from 2N1E sec 34, SE ~14mi to 1N3E sec 27	Fire Suppression Ridges; some natural break; targeted for additional treatment	Treat-Med	2012	Landscape				grant-landowner, neighborhood or road association
PAC004	from 1N1W sec 36, SE ~6mi to 1S1E sec 14	Fire Suppression Ridges; some natural break; targeted for additional treatment	Treat-Med	2012	Landscape				grant-landowner, neighborhood or road association
PAC006	01S 02E SEC 14 ~6mi East to 01S 03E sec 23	Fire Suppression Ridges; some natural break; targeted for additional treatment	Treat-Med	2012	Landscape				grant-landowner, neighborhood or road association
PAC007	NE boundary Fortuna/timber lands	WUI; fuel treatment buffer between residence and wildland	Treat-Med	2012	Landscape				grant-landowner, neighborhood or road association

Humboldt County Community Wildfire Protection Plan

LOCATION		Community Identified Treatment/Project Information Eel Fire Planning Unit							
Number Corresponds with location on map	Community, Structure, or Area (Value at Risk)	Description	Status	Year	Type	Acres	Veg. Type	Maintenance (actual or proposed)	Funding source (actual or proposed)
PAC011	Tompkins Hill Rd, Fortuna	Install address and Rd signs. Public education and outreach	Action-Needed	2012	Other-Access and Education				
PAC012	Loop Rd and off-shoots, Fortuna	Install address and Rd signs. Public education and outreach	Action-Needed	2012	Other-Access and Education				
PAC013	Mill St (single access), Fortuna	Install address and Rd signs. Public education and outreach	Action-Needed	2012	Other-Access				
PAC014	North of neighborhoods in Palmer Ck, near Fortuna	Shaded fuelbreak as a buffer between residents and wildlands	Treat-Med	2012	Landscape				
PAC015	Neighborhood at the top of Home Ave (single access), Fortuna	Improve defensible space where needed (evacuation planning)	Treat-High	2012	Defensible Space Other - Education				
RIO076	Price Creek Neighborhood – Rio Dell	Improve Price Creek Community Water Source (Blue Dot Program)	Update	2012	Other – Water and Education				grant-landowner, neighborhood or road association
RIO077	Pepper Tree Lane – Rio Dell	Improve Pepper Tree Lane area Water Source (Blue Dot Program)	Update	2012	Other - Water				grant-landowner, neighborhood or road association

LOCATION		Community Identified Treatment/Project Information Eel Fire Planning Unit							
Number Corresponds with location on map	Community, Structure, or Area (Value at Risk)	Description	Status	Year	Type	Acres	Veg. Type	Maintenance (actual or proposed)	Funding source (actual or proposed)
RIO083	Redwood Avenue – Rio Dell	Widen Redwood Avenue & improve bridge crossing for fire truck access	Action Need	2010	Other - Rd. Access				grant-landowner, neighborhood or road association
RIO084	Demo Left & Stafford to Happy Valley – Rio Dell	Slash Treatment/Vegetation Management along timber roads	Treat-Med	2012	Roadside Clearance				grant-landowner, neighborhood or road association
RIO095	Shively Rd (single access)	Vegetation management along road. Prioritize county roadside clearing	Treat-Med	2012	Roadside Clearance	14.43			
RIO096	Shively Rd (single access)	Public Outreach re defensible space and evacuation planning	Action-Needed	2012	Other-Education				
RIO097	Residences near Larabee Ck Rd/Johnson Ln (single acc)	Public outreach about defensible space and evacuation planning	Action-Needed	2012	Other-Education and Evacuation				
RIO099	Monument Rd, Rio Dell	Education outreach about defensible space and roadside fuel reduction. Improve signage and water availability	Action-Needed	2012	Roadside Clearance Other-Education and Water				
RIO100	Rio Vista Ln (single access) – Rio Dell	Public outreach re defensible space, fire safety, evacuation planning	Action-Needed	2012	Other-Education				

Humboldt County Community Wildfire Protection Plan

LOCATION		Community Identified Treatment/Project Information Eel Fire Planning Unit							
Number Corresponds with location on map	**Community, Structure, or Area (Value at Risk)**	**Description**	**Status**	**Year**	**Type**	**Acres**	**Veg. Type**	**Maintenance (actual or proposed)**	**Funding source (actual or proposed)**
RIO101	Hydesville neighborhoods interface areas	Public outreach re defensible space and fire safety	Action-Needed	2012	Other-Ed				

IV.10.9. Eel Action Plan

The following items are the initial priorities for community action for the Eel Planning Unit as recommended by this Humboldt County CWPP (not listed in order of priority). In an ideal world, everything recommended here would be implemented. However, it must be understood that implementation will be subject to the availability of funds and other resources and the willingness/ability of community members and Plan Partners to take action. This Action Plan can be cited in grant applications to leverage needed implementation funds and used to guide and inspire action.

Enhancing Fire Protection

- **Sustainable Fire Departments:** Community members within this Planning Unit should support their local fire department[11] through activities such as volunteering as firefighters or auxiliary members, making donations, supporting fundraisers, writing grants, and/or helping with administrative tasks. With community support, local fire departments can continue to provide a wide variety of vital emergency services.
- **Road Improvements:** Upgrade and/or repair roads that hinder access by emergency responders. Begin by systematically identifying and mitigating such access impediments. The following priority access issue was identified at a community workshop and is recommended for initial action in this plan:
    - Widen Redwood Avenue near Rio Dell and improve the bridge crossing for fire truck access.
- **Signage:** To aid emergency responders, residents and road associations should improve road and address signage throughout their communities. Make signs larger and reflective to increase visibility and install road and address signs where they are missing. Less noticeable but more sentimental address signs may remain but it is important to also post reflective signs with lettering at least three inches in height. Focus initial efforts in the following areas:
    - Fortuna: Tompkins Hill Road, Loop Road and offshoots, and Mill Street
    - Ferndale: Eugene Street
    - Rio Dell: Monument Road
- **Firefighting Water:** Increase the availability of water for fire protection by making water access locations known to fire departments and investing in more community water tanks. Neighborhood and road associations and/or Firewise Communities work with local fire departments to develop a *"Blue Dot" program*, which identifies the location of firefighting water sources by marking them with a blue reflective dot. This program also ensures that tanks and water systems are outfitted with fittings compatible with firefighting equipment. Begin by identifying where such a program is most needed. Focus initial efforts in the following neighborhoods:
    - Pepper Tree Lane, North of Rio Dell and West of Highway 101.
    - Price Creek, North of Rio Dell and West of Highway 101.
    - Monument Road, Southwest of Rio Dell

Creating Fire Safe Communities

- **Firewise Communities:** Pursue participation in the Firewise Communities/USA recognition program with neighborhood groups in developed areas adjacent to the

[11] *All local fire departments within this unit are listed above with their contact information in the "Wildfire Protection Capabilities" section.*

wildland, particularly where there are many residences located along dead-end roads. Actively implement and maintain the Firewise action plan on an annual schedule. Target the following neighborhoods on edges of communities in the higher risk interface areas, possibly through an affiliation with a road association:

- Near Fortuna: Tompkins Hill and loop roads, top of Home Avenue, and Mill Street
- Near Ferndale: William Creek Road and Eugene Street
- Near Rio Dell: Monument Road
- Near Carlotta: Cummings Creek and Fox Creek roads
- Holmes and Shively

Ensuring Safe and Effective Evacuation

- Encourage fire department representatives from each department within this Planning Unit to work with local law enforcement and the Humboldt County Office of Emergency Services to engage community members in evacuation preparedness. Efforts should be made to ensure that local gates are open or accessible during Red Flag conditions. Focus evacuation planning efforts in neighborhoods located along the following single access roads:
    - Fortuna: Tompkins Hill Road, Home Avenue, Mill Street
    - Ferndale: Eugene Street, Williams Creek Road
    - Carlotta: Cummings Creek Road, Fox Creek Road
    - Rio Dell: Monument Road, Rio Vista Lane
    - Shively/Holmes: Shively Road, Larabee Creek Road and Johnson Lane

Promoting Fire Safe Education

- Conduct public education and outreach efforts regarding strategies for fire safety, maintaining defensible space, and evacuation planning. Send out informational material in mailers throughout the communities. Consider involving Boy Scouts and Girl Scouts of America in outreach efforts. Focus initial educational efforts in the following neighborhoods:
    - Fortuna: Tompkins Hill Road, Home Avenue, Mill Street
    - Ferndale: Eugene Street, Williams Creek Road
    - Hydesville neighborhoods interface areas
    - Carlotta interface areas north of Highway 36
    - Rio Dell: Price Creek, Monument Road, Rio Vista Lane
    - Shively/Holmes: Shively Road, Larabee Creek Road, and Johnson Lane

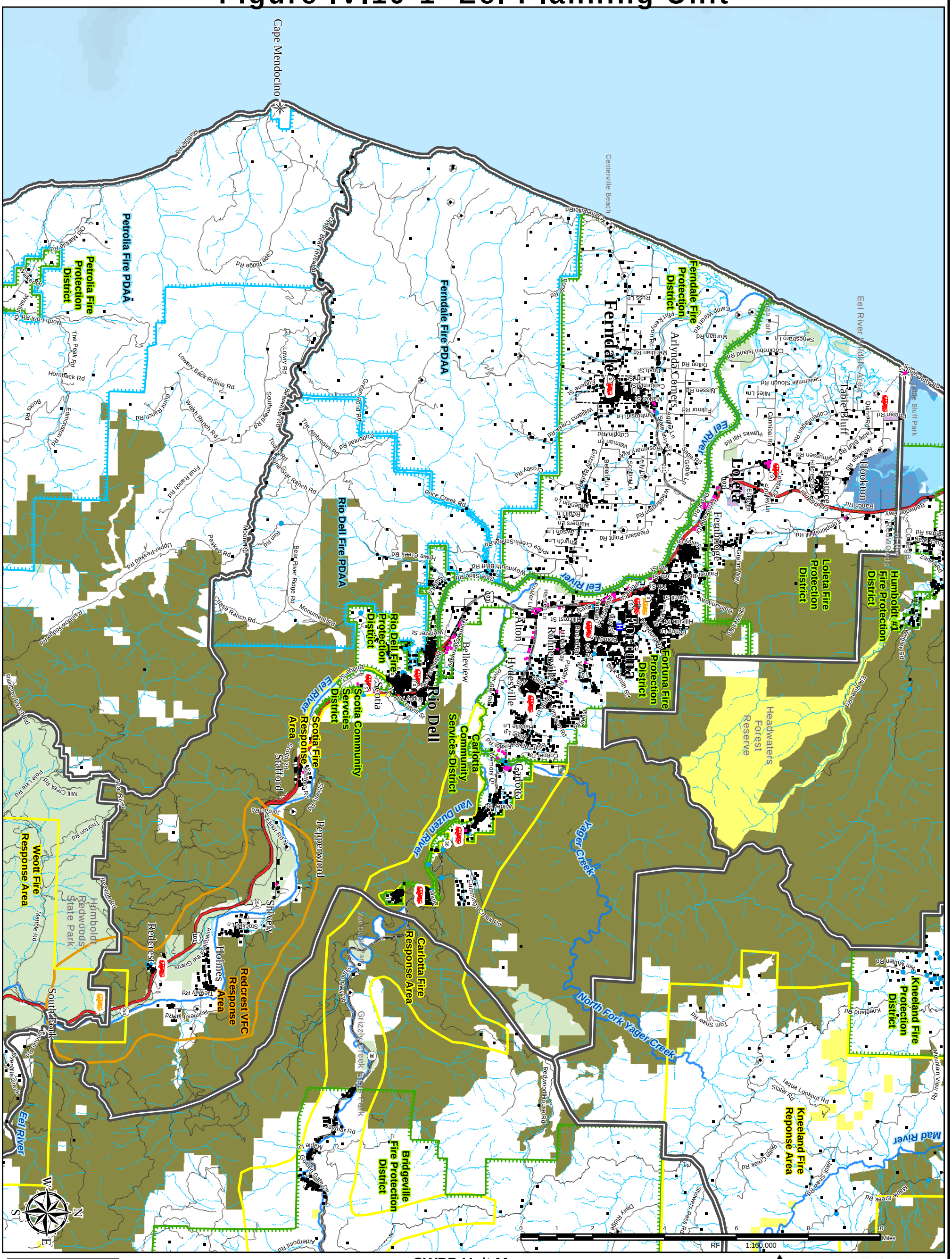
Reducing Wildfire Fuels (Flammable Vegetation)

- **Defensible Space:** Those residents living in areas within this Planning Unit that are at risk to wildfire should manage the flammable vegetation within their home ignition zone. Maintaining *defensible space* through vegetation treatments should be a routine and ongoing practice for all homes and *landscapes.* Community *Chipper Days* can facilitate this process by helping landowners get rid of slash and brush piles so that they do not become an additional hazard. Begin by identifying where defensible space is most needed within the planning unit. The following priority areas were identified at community meetings and are recommended for treatment in this plan:
    - The neighborhood at the top of Home Avenue in Fortuna
    - The neighborhood along Church Lane, Southeast of Carlotta

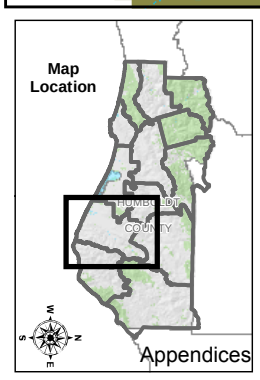
- **Roadside Clearance:** Manage roadside vegetation in order to improve and maintain access for emergency vehicles and ensure safe evacuation. Consider working with the California Conservation Corps or County Public Works Roads Division. Focus initial efforts along the following roads:
  - Williams Creek Road
  - Cummings Creek Road
  - Church Lane
  - Fox Creek Road
  - Highway 36 where needed
  - H-Line (Old lumber company haul road)
  - Monument Road
  - Shively Road

- **Landscape Fuels Reduction:** Construct *shaded fuelbreaks* as buffers between residential areas and wildlands to slow the progress of wildfires. This allows firefighters a higher probability of successfully protecting communities from wildfire damage. These buffers may also protect the wildlands from the spread of fires originating within communities. The following areas are recommended for priority treatment in this plan:
  - A shaded fuelbreak buffering WUI neighborhoods along the Northeast side of Fortuna, between the city and timberlands.
  - A shaded fuelbreak North of neighborhoods in Palmer Creek (North Fortuna)
  - A buffer between the neighborhoods along Church Lane and the wildlands (Southeast of Carlotta)

Figure IV.10-1 Eel Planning Unit



CWPP Unit Map



Legend

- CWPP Planning Unit Boundary

Emergency Response
- Local Fire Station
- CAL Fire Station \ Camp
- Six Rivers Fire Station

Hospitals and Clinics
- Hospital/Medical Center
- Red Cross

Lookout, Lights, Radio
- Lighthouse
- School

Local Fire Organization Response Area
- District
- Out of District
- Non-Tax (Volunteer Fire Company (VFC))
- Proposed District Annexation Area (PDAA)

Improved Parcels
- Improved Parcel (not actual location of improvement)
- Commercial or Industrial Lot (not actual location)

Airports
- Landing Strip

Highways and Roads
- HWY 101
- State HWY
- HWY or Secondary Road
- Local Road or Street

Hydrography
- Major River or Stream

Infrastructure
- Gauging Station
- Water Tank or Source
- Historic Locations

Land Ownership

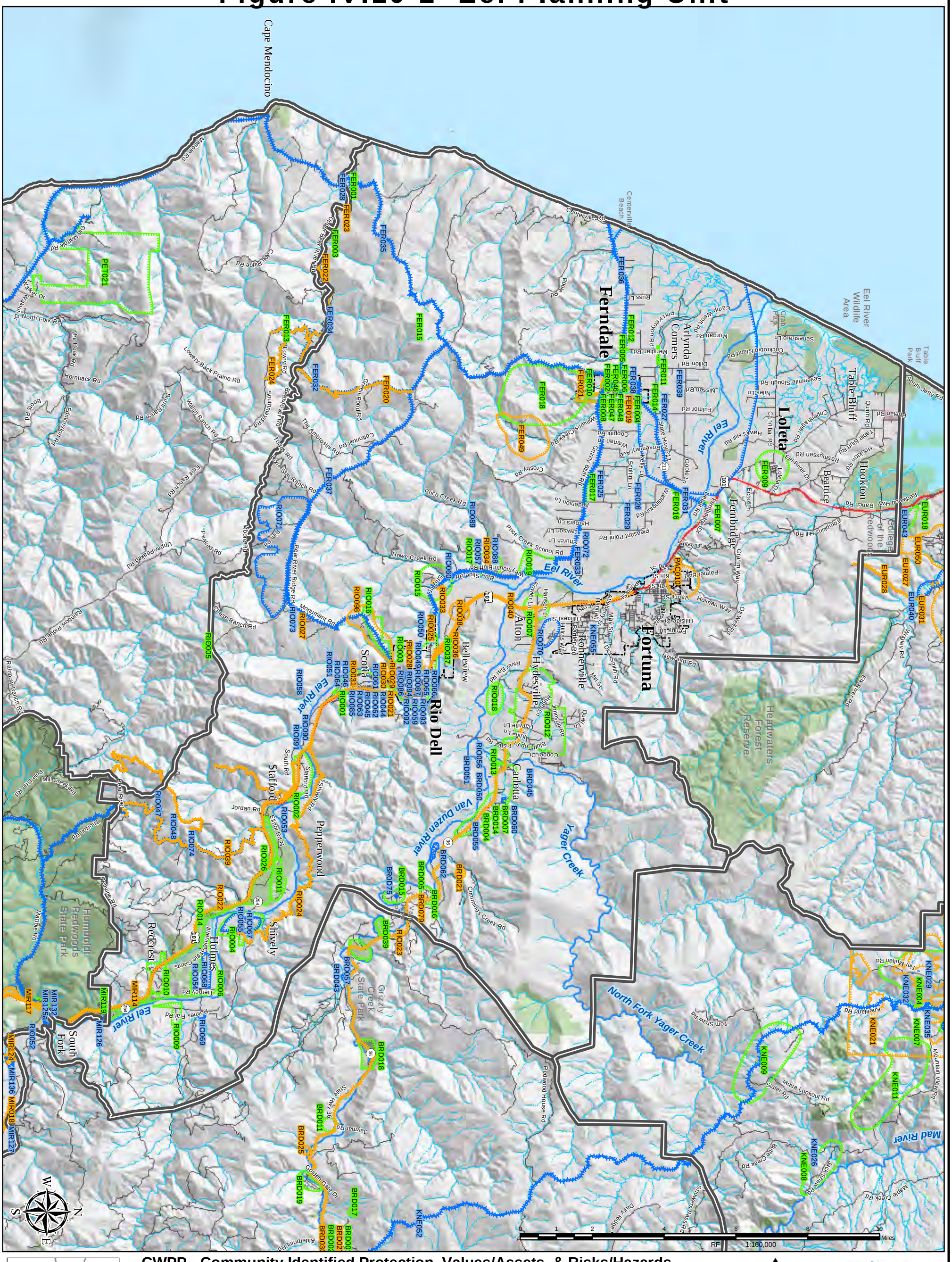
AGENCY
- Bureau of Land Management
- National Park Service
- State Park or Other State Lands
- Six Rivers National Forest
- U.S. Fish and Wildlife Service
- Tribal Lands
- Private
- Industrial Timber
- Cities

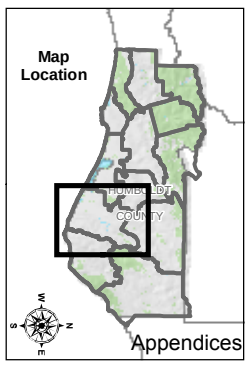
Land ownership and infrastructure data has been compiled by The County of Humboldt. Fire planning features identified at community workshops by residents; local, state, and federal fire service personnel; and Humboldt County staff. Other data sources were the 2006 Humboldt County Master Fire Protection Plan

This map is intended for planning purposes and should not be used for precise measurement or navigation.

Map compiled by County of Humboldt, March 2013.
Online maps visit: http://gis.co.humboldt.ca.us/
Contact: cimmit@co.humboldt.ca.us or jvondohlen@co.humboldt.ca.us

Figure IV.10-2 Eel Planning Unit





CWPP - Community Identified Protection, Values/Assets, & Risks/Hazards

Legend

- CWPP Planning Unit Boundary

Community Identified Features

- Protection/Evacuation
- Value/Asset
- Risk/Hazard

Land Ownership

- Parks/Public Land
- Reservation/Tribal Land
- Cities

Highways and Roads

- HWY 101
- State HWY
- HWY or Secondary Road
- Local Road or Street

Hydrography

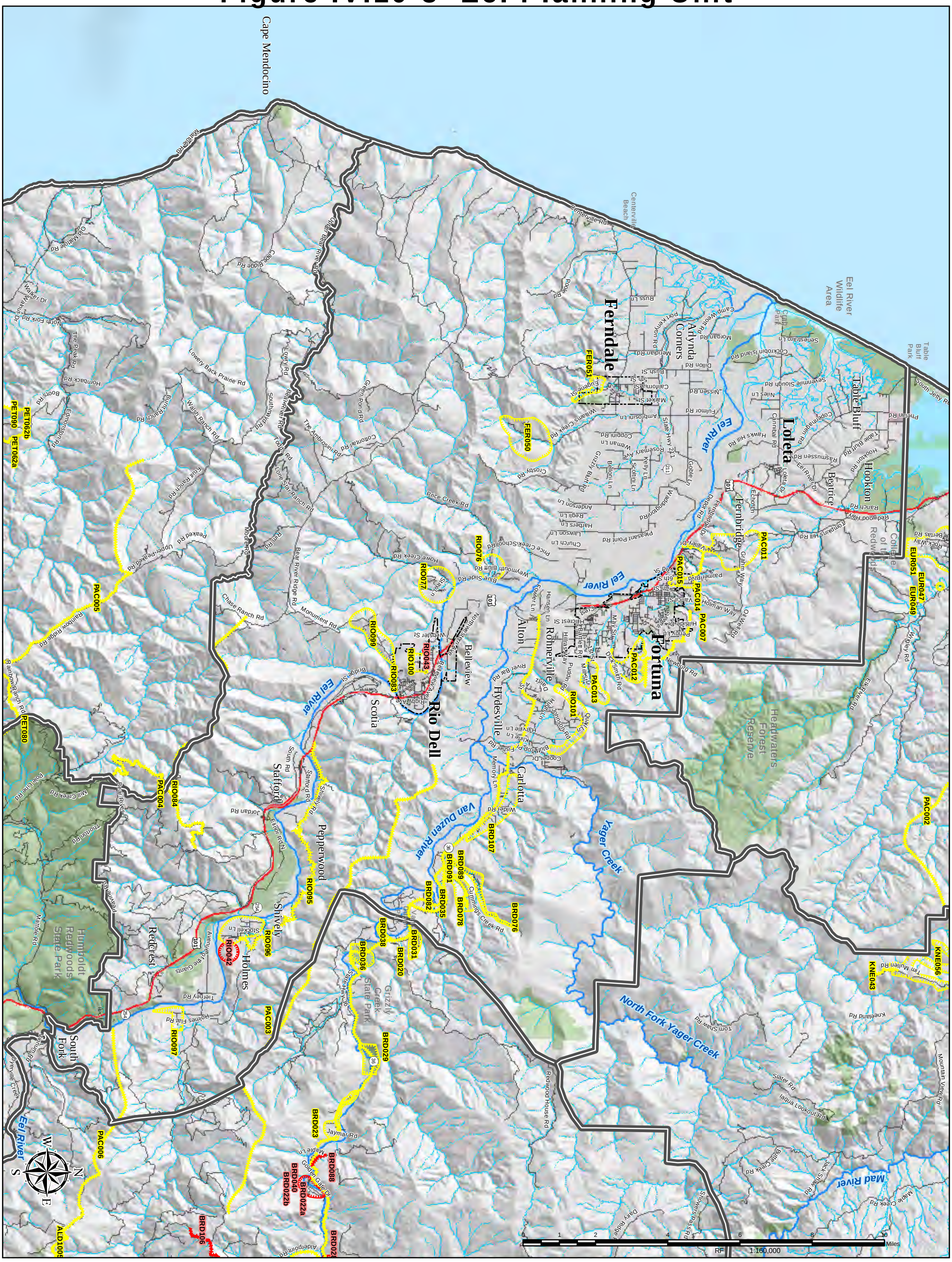
- Major River or Stream
- Perennial Stream
- Intermittent Stream

Land ownership and infrastructure data has been compiled by The County of Humboldt. Fire planning features identified at community workshops by residents; local, state, and federal fire service personnel; and Humboldt County staff. Other data sources were the 2006 Humboldt County Master Fire Protection Plan

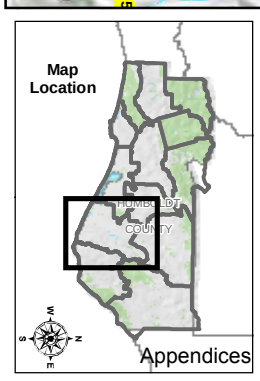
This map is intended for planning purposes and should not be used for precise measurement or navigation.

Map compiled by County of Humboldt, March 2013.
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Figure IV.10-3 Eel Planning Unit



CWPP - Community Identified Projects



Legend

- CWPP Planning Unit Boundary
- **Community Identified Projects**
  - Proposed Project
  - Treated Project
- **Land Ownership**
  - Parks/Public Land
  - Reservation/Tribal Land
  - Cities
- **Highways and Roads**
  - HWY 101
  - State HWY
  - HWY or Secondary Road
  - Local Road or Street
- **Hydrography**
  - Major River or Stream
  - Perennial Stream
  - Intermittent Stream

Land ownership and infrastructure data has been compiled by The County of Humboldt. Fire planning features identified at community workshops by residents; local, state, and federal fire service personnel; and Humboldt County staff. Other data sources were the 2006 Humboldt County Master Fire Protection Plan

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Map compiled by County of Humboldt, March 2013
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IV.11. Mad-Van Duzen Planning Unit Action Plan

IV.11.1. Mad-Van Duzen Planning Unit Description

The Mad-Van Duzen *Planning Unit* encompasses 300,661 acres situated in the southeastern region of Humboldt County. The Cities of Fortuna and Rio Dell and Humboldt Redwoods State Park are located to the west, while Trinity County and Six Rivers National Forest border the eastern side of the Unit. Highway 36 is the primary transportation route through the Unit; it is paralleled by the main waterway, the Van Duzen River, which is one of the last remaining free-flowing rivers in California. The river and highway travel across the center of the Unit in a westward direction. Kneeland and Alderpoint Roads provide access to the north and south, respectively. The Unit contains portions of both the Van Duzen River *watershed* and the Mad River watershed, with the Mad River flowing through the northeastern portion of the Unit. The topography includes steep canyons formed by the rivers and their *tributaries*, which include: Indian Creek, Larabee Creek, the Little Van Duzen River, Butte Creek, East Creek and Pilot Creek, to name a few.

The privately-owned town site of Bridgeville comprises the main community center within this Planning Unit, and it is located at the point where the three primary transportation routes—Highway 36, Kneeland Road and Alderpoint Road intersect. Other communities within the Unit include Dinsmore in the east, and Blocksburg in the southern region. Other distinct neighborhood groupings exist near Coyote Flat and Homestead Roads, and in the Golden Gate and Deerfield Ranch subdivisions as well. The communities within this Planning Unit were established upon a resource-based lifestyle; and agriculture, along with timber and non-timber forest products, continue to play an important role in the local economies. The area supports a variety of cottage industries, fine art trade, and social services as well.[1]

Private land is the dominant ownership pattern in this Unit. The composition of land uses include: farms and rural residences in the lower floodplain and near the river; large- and medium-sized swaths of ranchland; residential parcels bunched along the main roads; and a few parcels managed by various timber industries. The majority of residential properties lie along Highway 36, and around and in between Bridgeville and Dinsmore. Several clusters of residential property are also located to the south along Alderpoint Road and near Blocksburg. Residential parcel sizes span a wide range, "from standard house lots, 40- to 100-acres parcels, ranches with 1,000 acres or more, to small trailer parks."[2] Large portions of land along the eastern edge of the Unit fall within Six Rivers National Forest and are managed by the U.S. Forest Service. A few small areas of Bureau of Land Management Land (BLM) exist to the south of Highway 36 as well. A map of this planning unit can be viewed in Figure IV.11-1. Mad-Van Duzen Unit: CWPP Unit Map.

IV.11.2. Mad-Van Duzen Community Process Summary

Multiple community workshops were held, and several residents' homes were visited, in an effort to gather community input for the development of a local CWPP for this Planning Unit. Workshops were advertised on the radio, in the Bridgeville Community Center's newsletter, and flyers were sent home with students from the Bridgeville Elementary School. In 2012, at the Bridgeville Annual Firewise event, a group exercise was implemented, which involved maps of the Planning Unit area and invited those present to help identify and pinpoint on the maps where

[1] Humboldt County Department of Community Development Services. (2003, July). *Bridgeville Area Community Action Plan*. (pp.5-6.) Retrieved from http://www.co.humboldt.ca.us/planning/planning/documents/action_plans/2003_plans/brdg_web.pdf

[2] Firewise Communities/USA Recognition Program. (2010). *Bridgeville Community Assessment.* (p.4.)

particular *fire hazards* exist, the location of *protection resources*, such as fire water drafting sites, as well as values and *assets at risk* within the community that could be threatened by wildfire.

Participants were also asked to review pre-existing information illustrated on the maps which had been added by community members during community workshops that took place during the initial countywide planning process in 2006. These workshops and mapping exercise also facilitated discussion among community members about potential actions that could be taken to reduce fire risk in their communities. Through discussion and collaborative processes, participants identified major hazard areas and compiled lists of project proposals for enhancing their communities' fire preparedness.

The community-identified fire hazards, protection resources, and values and assets at risk discussed throughout the following sections of this Planning Unit Action Plan reflect information generated by these community workshops and mapping exercise, as well as information resulting from direct outreach to local fire departments and residents.

The project proposals resulting from community member discussions are contained in section IV.11.8. Community-Identified Projects in this Planning Unit Action Plan.

IV.11.3. Mad-Van Duzen Wildfire Environment

Approximately 63% of the Mad-Van Duzen Planning Unit is zoned "Very High *Fire Hazard Severity*," as determined by the California Department of Forestry and Fire Protection (CAL FIRE).[3] Thirty-seven percent of the Unit, including a substantial portion of the western area, is zoned "High Fire Hazard Severity," while one very small patch of land near Indian Creek (which encompasses less than 1% of the entire Unit area) is zoned "Moderate Fire Hazard Severity."

Summer weather in this Unit is consistently hot and dry. Steep, wooded slopes with thick underbrush are characteristic of this region. These features, accompanied by high wind speeds and low *moisture levels*, have the potential to spread fire very rapidly. Local vegetation is mainly comprised of forested areas, which contain redwoods as well as mixed *conifer forests* with fir and pine trees, oak woodlands, and large swaths of open grasslands.[4]

Traditionally, fire was an integral part of the *ecosystems* in this region. Forest management by indigenous tribes often included low-intensity, intentional burns that helped enhance forest ecosystems and prevent the accumulation of high *fuel loads*. Some of the early agricultural settlers in the late 1800s used intentional burning to clear and maintain grasslands for pasture animals. A heavy *fire suppression* campaign beginning in the 1930s has allowed the accumulation of dense, flammable vegetation in forest *understories*, which acts as *fuel* and increases the risk of high-intensity wildfires. Forest ecosystems accustomed to low-intensity fires that would burn off *brush* and newer starts in the understory become threatened by overcrowded forests and accumulated fuels. Intense timber harvests during the 20th century further exacerbated damages to forest ecosystem health.

The extent that the *landscape* has been altered as a result of fire suppression is reflected in the *condition class* of the Unit area. Condition class describes the degree of departure from the historical *natural fire regime*. Where the condition class indicates that fire has been absent for an unnaturally long time, the hazard and potential damages are high to both the environment and human developments in the area. Approximately 52% of the Mad-Van Duzen Planning Unit is

[3] CAL FIRE. (2007). *Fire Resources Assessment Program (FRAP).* [Map showing Fire Hazard Severity Zone ratings within various geographic areas, mapped by county]. Fire Hazard Severity Zones Map. Retrieved from http://frap.cdf.ca.gov/

[4] County of Humboldt, Natural Resources Planning & Humboldt County Fire Safe Council. (2012). *Humboldt County Hazardous Fuels Reduction Plan Update 2009-2010.* (p.105.) Retrieved from http://www.co.humboldt.ca.us/natural-resources/fire_safe_council/

condition class 3, meaning the fire regime is significantly altered from the historical range; and approximately 20% of the area is condition class 2, or moderately altered from the historical range.

Fortunately, there have been few major fire events in this Unit within the last decade. Those fires that did occur were relatively small and widely dispersed across the Unit; they include:

- The Pilot Fire, 2004: 283 acres.
- The Larabee 3 Fire, 2008: 29 acres.
- The Iaqua Fire, October 2009: 170 acres.

Fires in the previous decade, between the years 1980-1999 tended to be significantly larger; these fire events included:

- The Chalk Rock Fires, 1992: 203 acres; and 1993: 572 acres.
- The Fort Baker Fires, 1994: 815 acres; and 1995: 138 acres.
- The Charles Fire, 2007: 55 acres.

Vehicles and vehicular accidents on Highway 36 cause the majority of fire incidences in this Unit. *Ignitions* from vehicles have a variety of potential starts, such as: "hot mufflers or catalytic converters on vehicles parked over grasses by the side of the road, vandals torching abandoned vehicles on the roadside, or vehicles hitting the side of a bank or rolling down a ravine. Unfortunately, these are common occurrences on this highway."[5] Power lines have also been the cause of many fire starts in this Unit. Humans are another likely *ignition source*, and fire starts may be accidental or incendiary. Vacant or unmaintained structures throughout the communities in this Unit are potential *fire hazards*, as they present easy targets for arsonists and often have unmaintained *Home Ignition Zones*.

Neighborhoods in this Unit exist within the *wildland-urban interface* (WUI), which increases the risk of *wildland fires* becoming *structural fires*, and vice versa. This risk is exacerbated by the fact that "many homes have large amounts of dense vegetation growing in the Home Ignition Zone and flammable items in direct contact with the structure."[6] *Dead plant matter* with low moisture levels within 100-150 feet of the homesteads pose some of the greatest threats to *structural ignitability*. Of particular concern are houses with needles and leaves accumulating on rooftops or in rain gutters. Houses with wooden gates, fences, latticework and stacks of firewood located near or against structures add significantly to this risk, as does the presence of wooden decks, particularly those with dead plant matter accumulated beneath them. Figure IV.11-2 found at the end of this Planning Unit Action Plan illustrates risks and hazards identified by community members at public workshops and can be used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt County Web GIS Portal, "Fire Planning" section: http://gis.co.humboldt.ca.us/.

Highway 36 is the central *ingress and egress* route, with several smaller roads connecting residences and neighborhoods to it. Roadside fuels, which increase the risk of ignitions, are not uncommon along these access routes, and the topography of the region necessitates that the majority of roads in this Unit are windy and often narrow. The narrowness of smaller roads leading to remote residences could create serious complications for emergency vehicle response trying to gain access during simultaneous home evacuations. Routes may be overgrown with vegetation so as to make it difficult for fire engines to gain access, and some properties may have inadequate *turn around spaces*. The potential for landslides in the area could also inhibit access.

[5] Firewise Communities/USA Recognition Program. (2010). *Bridgeville Community Assessment.* (p. 9.)

[6] Firewise Communities/USA Recognition Program. (2010). *Bridgeville Community Assessment.* (p. 12.)

Water for fire protection is extremely limited in this Unit. There are no fire hydrants in these communities, and most residents' water tanks contain just 3,000 gallons or less, which often falls short of what is anticipated for fire suppression needs. Furthermore, these water tanks may lack the proper fittings for fire engines to be able to utilize this water. *Fire protection water* may be *drafted* from the following locations:

- Sweasey Lake (new name Forest Lake)
- Root Creek drafting site
- Little Larabee Creek - drafting
- McClellan Mountain Ranch pond
- Sanderson Pond (dry in the Fall)
- Murphy Pond
- McCann Eel River drafting
- Dyerville river drafting

The map in Figure IV.11-2 found at the end of this Unit Action Plan illustrates these *drafting sites* as well as other community-identified wildfire protection resources. The map can be used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt County Web GIS Portal, "Fire Planning" section: http://gis.co.humboldt.ca.us/.

IV.11.4. Mad-Van Duzen Values and Assets at Risk

Assets at risk can be defined as those things that are important to quality of life that can be threatened with destruction or loss from wildfire. These may include community assets such as homes and businesses, as well as environmental values such as wildlife habitat, natural resources, and air quality, along with any other important attribute that individual communities rely on for their well being. Loss or damage to community assets as a result of wildfire can have short- or long-term impacts of varying severity, depending on the asset. Short-term loss caused by a wildfire can include the destruction of residences, commercial assets, timber, wildlife habitat, scenic vistas, and *watersheds*. Long-term effects may include displaced persons, smaller timber harvests, reduced access to affected recreational areas, and destruction of cultural, ecological, and economic resources, and community infrastructure.

The majority of *assets at risk* in this Planning Unit are residential homes and communities, along with a variety of commercial and service industries, community centers, medical and dental clinics, schools, fire stations, churches, museums, as well as infrastructure components, such as cell phone towers and *access roads*. The ranching, agricultural, and timber industries within the Unit are also considered assets at risk.

The map in Figure IV.11-2 found at the end of this Unit Action Plan illustrates values and assets at risk to wildfire identified by community members at public workshops. The map can be used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt County Web GIS[7] Portal, "Fire Planning" section: http://gis.co.humboldt.ca.us/. Some of the community-identified assets at risk within this Unit include:

- Swimmer's Delight/Van Duzen Park
- Swain's Flat Houses/Market
- Golden Gate Subdivision
- Bridgeville downtown/Bridge for evacuation
- Dinsmore Airport
- Historic Blocksburg
- PG&E Substation/CalTrans yard
- Triumphant Life Camp

The Six Rivers National Forest, Grizzly Creek Campgrounds and State Park, and Robinson Rock comprise some of the environmentally significant areas within this Unit. These areas, along

[7] Geographic Information Systems (GIS).

with the wide swaths of undeveloped ranchlands throughout the region, provide breathtaking vistas and important *habitat* for wildlife species.

IV.11.5. Mad-Van Duzen Community Preparedness

Communities in this Unit are assisted by the efforts of the Van Duzen Watershed *Fire Safe Council* (FSC), which was founded in 2004, and has since garnered close to one million dollars in grant funding for projects to improve fire safety in these communities. The mission of the Van Duzen Watershed FSC is: "to protect and preserve our homes, forests and waterways from the dangers of wildfires by actively performing *fuel reduction* work, creating a working fire plan, educating and motivating residents to be *fire safe*, coordinating funding and action plans with government agencies, detailed mapping and risk assessment and creating an emergency response system for our community."[8] Successful projects have included constructing *fuelbreaks* in and around residential areas, creating *defensible space* around homes, conducting roadside clearance, and providing community members with educational materials to improve their fire awareness. The Van Duzen Watershed FSC can be reached by calling (707)-446-4530, or by visiting the Bridgeville Community Center website at: http://www.bridgevillecommunitycenter.org/

The Van Duzen Watershed FSC is also involved with the County in implementing the *Fire-adapted Landscapes and Safe Homes (FLASH) program*. FLASH is a rebate program that reimburses property owners for *hazardous vegetation management* completed around their homes, along access routes, and in particularly hazardous areas. Between 2010 and 2011, 51 acres were treated under the FLASH program and 22 site visits including a home risk assessment were conducted by FSC staff. The program has received additional funding for 2012-2013 and the goal is to treat approximately 38 acres.

The Van Duzen Watershed FSC is currently in the process of conducting outreach events and workshops to gather community input for the creation of a local *community wildfire protection plan* (CWPP). This Plan will help increase community awareness of fire safe practices and provide residents with resources for reducing *fire risk* in their homes and communities.

Bridgeville has been a nationally recognized Firewise Community since 2010 and holds an annual Fire Safety Day, which creates an opportunity to educate the community about fire emergency preparation and fire prevention while enjoying live music and festivities. Since gaining Firewise recognition, there have been several meaningful fire safety modifications throughout the community, including fuels reduction projects, such as hazardous vegetation clearance around vacant buildings and roadsides, creating defensible space around homes, and improving emergency vehicle access on roads and driveways.[9]

IV.11.6. Mad-Van Duzen Wildfire Protection Capabilities

The Bridgeville *Volunteer Fire Department* (BVFD) is comprised of ten volunteer firefighters who provide fire protection as well as rescue, and basic life support (BLS) emergency medical services to approximately 1,200 residents within 196 square miles in this Planning Unit. The BVFD's firefighting *apparatuses* include three 750 gallon pumpers and a rescue wagon.[10] The

[8] Van Duzen Watershed Fire Safe Council (2012). Van Duzen Watershed Council Facebook page. Retrieved from http://www.facebook.com/pages/Van-Duzen-Watershed-Fire-Safe-Council/382176151812405

[9] Firewise Communities/USA Recognition Program. (2010). *Bridgeville Community Assessment.* (pp. 13-17.)

[10] Bridgeville Fire Protection District. (2011, November). *Bridgeville Fire Protection District Municipal Service Review.* Prepared for Humboldt Local Agency Formation Commission. (p.9). Retrieved from http://www.humboldtlafco.org/sites/default/files/Fire%20District%20Protest%20Notice/Bridgeville%20FPD%20MSR_Adopted%20November%202011.pdf .

ability for the BVFD to provide effective emergency service is sometimes hampered by unmarked roads, missing addresses, inadequate water shortage, and outdated equipment. The BVFC can be reached by calling (707) 777-3424. The BVFD uses a vehicle storage barn as a fire apparatus garage. This has been deemed inadequate for the VFD's needs, and it has been difficult to secure funding to support construction of a fire station.

Up until recently, the BVFD relied solely on donations and fundraising efforts, was fiscally sponsored by The Bridgeville Community Center, and had no specific boundaries or access to tax revenue. However, in August 2012, the BVFD sought and was granted recognition as an official *fire protection district* (FPD). The decision was contingent on voter-approval of a special (parcel) tax to finance fire protection services. The results of the special mail in ballot election held on August 21st, 2012 determined that the formation of the Bridgeville Fire Protection District was approved by voters! The new Bridgeville Fire Protection District covers approximately 196 square miles of the area surrounding Bridgeville.

CAL FIRE is responsible for addressing wildland fires in this Unit. There is a CAL FIRE station in Bridgeville that is staffed only seasonally, during the declared *fire season*. CAL FIRE resources also frequently respond out of their fire station in Fortuna.

Communities in this Unit have various needs associated with improving the availability of emergency water for wildfire protection. Many existing water sources are in need of maintenance, protection, or improvements. There is also a need to make the location of existing water sources more apparent to firefighters, and for community members to ensure that their water sources are properly outfitted for firefighting equipment.

IV.11.7. Mad-Van Duzen Evacuation

Evacuation from the Mad-Van Duzen Planning Unit will travel either east or west along Highway 36, or it will travel north on Kneeland Rd., or south on Alderpoint Rd., depending on law enforcement recommendations based on *fire behavior*, wind pattern, traffic, and ingress of emergency vehicles. There are numerous smaller roads connecting residences and neighborhoods to Highway 36. Some neighborhoods in the Unit, like the one west of Blocksburg near Homestead Rd., depend on a closed network of smaller roads. Adequate ingress and egress along these roads is vital to a large portion of the community that may need to access the main highway *evacuation route* and for firefighters who will be using the roads to access wildfires burning in these areas.

Few alternative routes exist for accessing the communities in this Unit. The eastern town of Dinsmore may be reached via Bear Creek Rd. to the north. Egress from Blocksburg could potentially be achieved via a USFS road connected to Church St.; however, utilization of this route would likely necessitate permission and assistance from the U.S. Forest Service.

Evacuation impediments may include: landslides, fallen trees, overgrown vegetation, poorly marked streets and intersections, and *one-way-in, one-way-out roads* that could inhibit evacuation and emergency response vehicles, or leave residents stranded should the roads become blocked.

During wildfire events that have the potential to threaten personal safety, community evacuation sites may be established where residents can go to survive a wildfire. Evacuation sites will be established in different locations depending on the anticipated path of the wildfire. The determination for the location of these sites is normally made by Humboldt County Emergency Operations Center Incident Commander in cooperation with an *Incident Management Team*. The Humboldt County Sheriffs and Emergency Officials will use mass communication and door-to-door methods to inform residents about the threat and where residents should go to take shelter.

If a catastrophic event occurs, residents may not be able to reach designated evacuation sites. In such cases, residents may need to make decisions on their own about seeking shelter where they can survive the passage of the wildfire until they can reach an evacuation site. It can be very

difficult to determine the right thing to do as the fire approaches. Before a wildfire threatens, community members should talk to their local fire department about evacuation procedures in their neighborhood.

See section V.2.3 in Part V. Fire-Safe Communities for more information on preparing for safe evacuation and evacuation planning for pets and livestock. Also see section II.3.5 Evacuation Routes and Vulnerability in Part II. Risk Assessment for information about evacuation procedures and challenges in Humboldt County.

IV.11.8. Mad-Van Duzen Community Identified Potential Projects

The following matrix includes community identified proposed projects based on input from the community processes discussed above. A detailed description of each heading in the matrix can be found in Appendix G: Descriptive Characteristics for Community Identified Projects Matrix. These projects are illustrated on the community-identified projects map found at the end of this Unit Action Plan (Figure IV.11-3). Projects include those carried over from the 2006 fire-planning process and those identified and refined during the 2012 CWPP update process. This information can also be viewed on the fire planning GIS Portal. The GIS Portal allows users to search for and view specific fire planning features by location or to zoom into a desired area from an aerial view. To access the Portal, go to: http://gis.co.humboldt.ca.us/ and choose "Fire Planning" from the list of mapping applications. The data collected through this Planning process are included in the GIS layers within the Portal.

No vegetation *treatments* recommended in this plan will be carried out without the consent and involvement of the property owner and all applicable local, state and federal regulations must be observed.

Humboldt County Community Wildfire Protection Plan

LOCATION		Treatment/Project Information Eel Fire Planning Unit							
Number Corresponds with location on map	**Community, Structure, or Area (Value at Risk)**	**Description**	**Status**	**Year**	**Type**	**Acres**	**Veg Type**	**Maintenance (actual or proposed)**	**Funding source (actual or proposed)**
ALD028	Alderpoint Rd	Hazardous fuels reduction on Alderpoint Road in brushy or forested sections	Treat-High	2010	Roadside Clearance				grant-landowner-Assn.
ALD033	Sunset Ridge Road	Hazardous fuels reduction on Larabee Creek Ranch / Sunset Ridge Road	Treat-Med	2010	Roadside Clearance				grant-landowner-Assn.
ALD034	Homestead Road	Hazardous fuels reduction on Larabee Creek Ranch / Homestead Road	Treat-Med	2010	Roadside Clearance				grant-landowner-Assn.
ALD035	Blocksburg	Brush clearing in defensible space around Historic Buildings in Blocksburg	Treat-Med	2010	Defensible Space				grant-landowner-Assn.
ALD036	Alderpoint Rd & Pine Mtn. Rd.	Fuelbreak for defensible space around Casterlin School	Treat-Med	2010	Defensible Space				grant-landowner-Assn.
ALD1005	From Alderpoint Rd approx. 15.0 mi. west	Ridgetop Lost Flat Ranch: Fuelbreak	This year	2012	Landscape				

Humboldt County Community Wildfire Protection Plan

LOCATION		Treatment/Project Information Eel Fire Planning Unit							
Number Corresponds with location on map	**Community, Structure, or Area (Value at Risk)**	**Description**	**Status**	**Year**	**Type**	**Acres**	**Veg Type**	**Maintenance (actual or proposed)**	**Funding source (actual or proposed)**
ALD1006	From Alderpoint Rd approx 15.0 mi. west	Ridgetop Lost Flat Ranch: Fuelbreak	This year		Landscape				
ALD1007	From Alderpoint Rd approx 15.0 mi. west	Ridgetop Lost Flat Ranch: Fuelbreak	Proposed	2012	Landscape				
ALD1008	From Alderpoint Rd approx 15.0 mi. west	Lost Flat Ranch: Lateral Fuelbreaks (3)	This year		Landscape				
ALD1009	Alderpoint Rd 15 mi. ea.	Lateral Shaded Fuelbreaks (3)	Funded		Landscape	300			Recourse Advisory Council (RAC) $100,000+ grant
BRD020	HWY 36 east to Trinity CO line	fuel reduction along State Highway 36 east to Trinity CO line	Treat-Med	2010	Roadside Clearance				grant-landowner-Assn.
BRD023	Swains Flat Community	fuel reduction along Swains Flat & Hwy 36	Initiated	2007	Landscape				

LOCATION		Treatment/Project Information Eel Fire Planning Unit							
Number Corresponds with location on map	**Community, Structure, or Area (Value at Risk)**	**Description**	**Status**	**Year**	**Type**	**Acres**	**Veg Type**	**Maintenance (actual or proposed)**	**Funding source (actual or proposed)**
BRD026	~ 1.7 mi east of Bridgeville, hairpin turn at bottom of grade	Fuel reduction at hairpin turn at bottom of grade, ~1.7 mi east of Bridgeville	Treat-Low	2010	Roadside Clearance				Cal-Trans
BRD029	Grizzly Creek Campgrounds, CA State Park/Hwy 36	Fuel reduction in Grizzly Creek Campgrounds/CA State Park along Highway 36	Treat-Med	2010	Landscape				grant-landowner-Assn.
BRD031	Redwood House Road/Hwy 36	Redwood House Road and Hwy 36: fuel reduction	Treat-Med		Roadside Clearance				grant-landowner-Assn.
BRD034	Weekender 46204 ST Hwy 36	Fuel reduction at Weekender 46204 ST Hwy 36	Treat-Med	2010	Landscape	19.71			grant-landowner-Assn.
BRD036	Carlotta Pump Site	Fuel reduction at Carlotta Pump Site near 14535 ST Hwy 36	Treat-High	2010	Landscape	5.09			grant-landowner-Assn.

Humboldt County Community Wildfire Protection Plan

LOCATION		Treatment/Project Information Eel Fire Planning Unit							
Number Corresponds with location on map	**Community, Structure, or Area (Value at Risk)**	**Description**	**Status**	**Year**	**Type**	**Acres**	**Veg Type**	**Maintenance (actual or proposed)**	**Funding source (actual or proposed)**
BRD038	Swimmer's Delight/Van Duzen Park/ Hwy 36	Fuel reduction at Swimmer's Delight/ Van Duzen Park along Hwy 36	Treat-Med	2010	Landscape				grant-landowner-Assn.
BRD063	26360 Hwy 36 to 33396 Hwy 36	Hwy 36 Hazardous fuels reduction, thinning and chipping - Hwy 36 mile post 26 to 33.5. Work with CalTrans	Treat-Med	2009	Roadside Clearance				grants - Cal Trans
BRD064	First 2.3 mi Alderpoint Rd from Bridgeville to Blocksburg	Alderpoint Road shaded fuelbreak - Roadside Shaded Canopy. 50 ft each side of Rd from Bridgeville to Blocksburg.	Treat-High	2009	Roadside Clearance				grant-landowner-Assn.
BRD065	Upper Little Larrabee Rd neighborhood, Private Rd.	Upper Little Larrabee Rd (Private road), shaded fuelbreak - .5 Miles, 50 ft. each side of road	Funded	2010	Roadside Clearance	6.6	Mixed Conifer	Check re-growth every 3 years	2010 CA FSC Grant USDA

LOCATION		Treatment/Project Information Eel Fire Planning Unit							
Number Corresponds with location on map	Community, Structure, or Area (Value at Risk)	Description	Status	Year	Type	Acres	Veg Type	Maintenance (actual or proposed)	Funding source (actual or proposed)
BRD066	McClellan Mtn. Rd.	McClellan Mountain Rd.: 5 mile shaded fuelbreak, 50 ft. on each side of road -Part of Clear Roads Project.	Funded	2010	Roadside Clearance	60	Mixed Conifer	Check re-growth every 3 years	2010 CA FSC Grant
BRD068	Barnum Timber Subdivision 32444 Hwy 36 and unknown road name	Barnum Timber subdivision: 5 mile Roadside Shaded Canopy--thinning and chipping--50 ft. each side of road, starting at Hwy 36 mile post 31.6 and Barnum	Treat-High	2009	Roadside Clearance	60	Brush, Mixed Conifer	Yearly	Landowner and FSC
BRD080	Hwy 36 & McClellan Mtn Rd	Fuel reduction starting of Hwy 36 and beginning of McClellan Mtn Rd	Funded	2010	Roadside Clearance				
BRD083A	Private road, Bear Creek Rd Complex & Hwy 36	Private road Bear Creek Rd Complex, shaded fuelbreak--thinning and chipping,-- 50 ft. each side of road for 8 miles	Treated	2009	Roadside Clearance		Mixed Conifer, Oaks	3 year cycle	USDA 2009 grant

Humboldt County Community Wildfire Protection Plan

LOCATION		Treatment/Project Information Eel Fire Planning Unit							
Number Corresponds with location on map	**Community, Structure, or Area (Value at Risk)**	**Description**	**Status**	**Year**	**Type**	**Acres**	**Veg Type**	**Maintenance (actual or proposed)**	**Funding source (actual or proposed)**
BRD086	Upper Little Larrabee Rd & Hwy 36, Private Rd.	Roadside Shaded Canopy. 50 ft each side of Rd. where needed Upper Little Larabee Rd. at Hwy 36	Treat-High	2009	Roadside Clearance				grant-landowner-Assn.
BRD087	Kergerson Lake Rd	Kergerson Lake Rd. Fuels Reduction - Roadside Shaded Canopy. 50 ft each side of road for 2 miles.	Treat-High	2009	Roadside Clearance	24		Check re-growth every 3 years	grant-landowner-Assn.
BRD105	Alderpoint Rd 15 mi. ea.	USFS 1N10 Rd - Shaded fuelbreak along road	Funded		Roadside Clearance	97			Recourse Advisory Council (RAC) $100,000+ grant
PAC003	from 2N1E sec 34, SE ~14mi to 1N3E sec 27	Fire Suppression Ridges; some natural break; targeted for additional treatment	Treat-Med		Landscape				grant-landowner-Assn.
PAC006	01S 02E SEC 14 ~6mi East to 01S 03E sec 23	Fire Suppression Ridges; some natural break; targeted for additional treatment--fuel reduction	Treat-Med		Landscape				grant-landowner-Assn.

IV.11.9. Mad-Van Duzen Action Plan

The following items are the initial priorities for community action for the Mad-Van Duzen Planning Unit as recommended by this Humboldt County CWPP (not listed in order of priority). In an ideal world, everything recommended here would be implemented. However, it must be understood that implementation will be subject to the availability of funds and other resources and the willingness/ability of community members and Plan Partners to take action. This Action Plan can be cited in grant applications to leverage needed implementation funds and used to guide and inspire action.

Enhancing Fire Protection

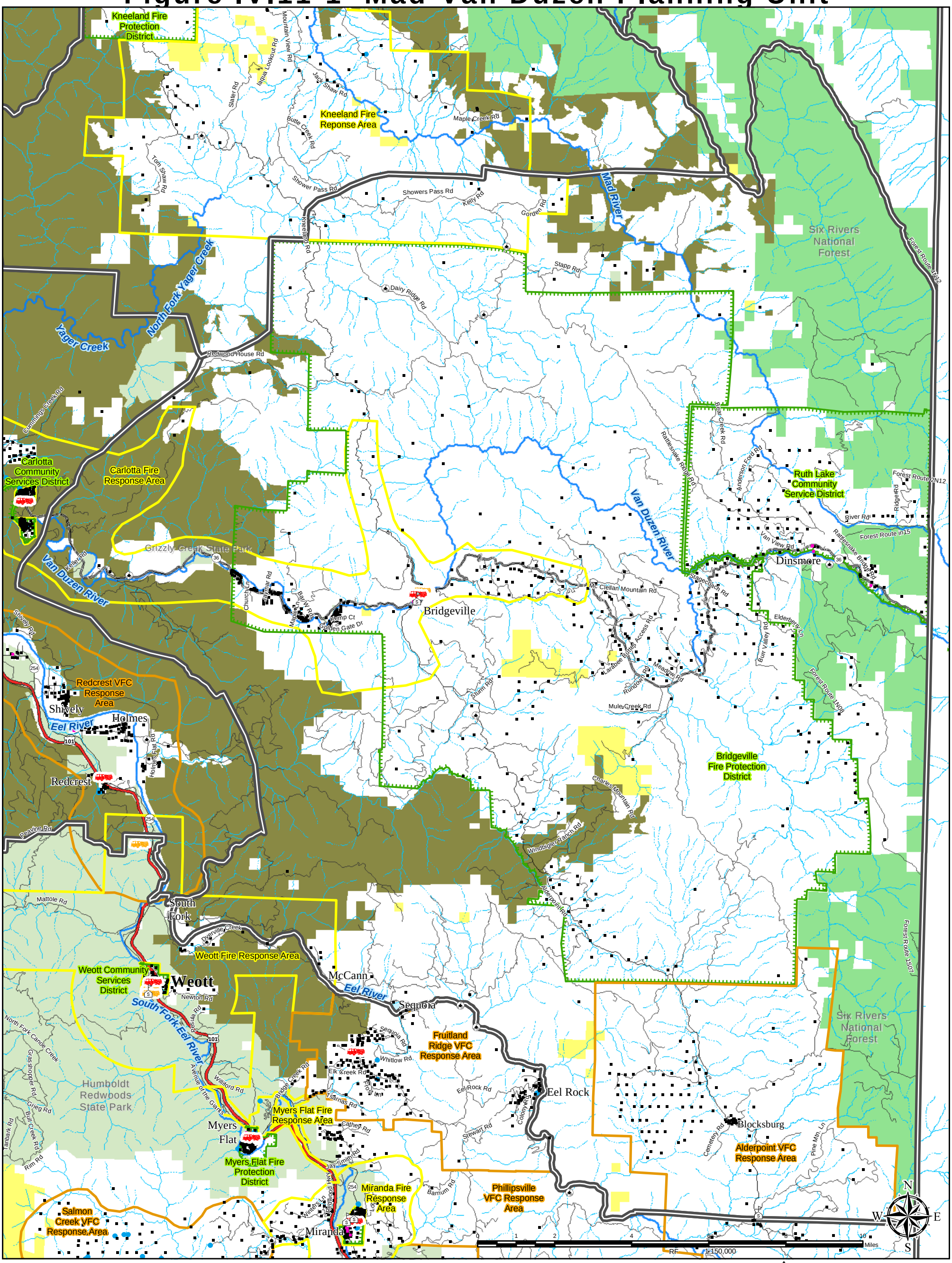
- **Sustainable Fire Departments:** Registered voters within the BVFD response area recently made a significant commitment to supporting the sustainability of the department by approving a special tax that will raise much needed revenue. Because it is still an all volunteer department community support will still be necessary through activities such as volunteering as firefighters or auxiliary members, making donations, supporting fundraisers, writing grants, and or helping with administrative tasks. With community support, the local fire department can continue to provide a wide variety of vital emergency services.
- **Firefighting Water:** Increase the availability of water for fire protection by making water access locations known to fire departments and investing in more community water tanks. Maintain existing water tanks and expeditiously make repairs when they become necessary. Neighborhood and road associations and/or Firewise Communities work with local fire departments to develop a *"Blue Dot" program*, which identifies the location of firefighting water sources by marking them with a blue reflective dot. This program also ensures that tanks and water systems are outfitted with fittings compatible with firefighting equipment. Begin by identifying where such a program is most needed.

Reducing Wildfire Fuels (Flammable Vegetation)

- **Defensible Space:** Those residents living in areas within this Planning Unit that are at risk to wildfire should manage the flammable vegetation within their home ignition zone. Maintaining defensible space through vegetation treatments should be a routine and ongoing practice for all homes and landscapes. Community *Chipper Days* can facilitate this process by helping landowners get rid of *slash* and brush piles so that they do not become an additional hazard. Begin by identifying where defensible space is most needed within the Planning Unit. The following priority areas were identified at community meetings and are recommended for treatment in this plan:
  - Landscapes surrounding historic buildings in Blocksburg.
  - Landscape surrounding Casterlin School, on Alderpoint Road and Pine Mountain Road.
- **Roadside Clearance:** Manage roadside vegetation in order to improve and maintain access for emergency vehicles and ensure safe evacuation. Consider working with the California Conservation Corps or County Public Works Roads Division. Focus initial efforts along the following roads:
  - Sunset Ridge Road
  - Homestead Road
  - McClellan Road
  - Kergerson Lake Road
  - Redwood House Road
  - Upper Little Larabee Road
  - Bear Creek Road
  - Burr Valley Road

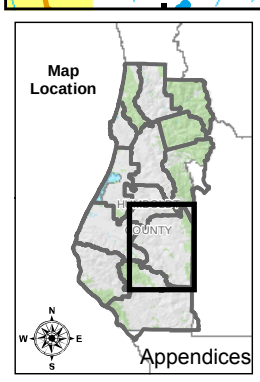
- **Landscape Fuels Reduction:** Construct *shaded fuelbreaks* as buffers between residential areas and wildlands to slow the progress of wildfires. This allows firefighters a higher probability of successfully protecting communities from wildfire damage. These buffers may also protect the wildlands from the spread of fires originating within communities. The following areas are recommended for priority treatment in this plan:
  - Ridgetop and lateral fuelbreaks around Lost Flat Ranch, along Alderpoint Road.
  - Hazardous vegetation removal in the Swains Flat community along Highway 36.
  - Reduce fuels in Grizzly Creek Campground areas.
  - Reduce fuels surrounding the Carlotta Pump site.
  - Reduce fuels around Swimmer's Delight/Van Duzen Park area.

Figure IV.11-1 Mad-Van Duzen Planning Unit



CWPP Unit Map

Map Location



Legend

CWPP Planning Unit Boundary

Emergency Response
- Local Fire Station
- CAL Fire Station \ Camp
- Six Rivers Fire Station

Hospitals and Clinics
- Hospital/Medical Center
- Red Cross

Lookout, Lights, Radio
- Lighthouse
- School

Local Fire Organization Response Area
- District
- Out of District
- Non-Tax (Volunteer Fire Company (VFC))
- Proposed District Annexation Area (PDAA)

Improved Parcels
- Improved Parcel (not actual location of improvement)
- Commercial or Industrial Lot (not actual location)

Airports
- Landing Strip

Highways and Roads
- HWY 101
- State HWY
- HWY or Secondary Road
- Local Road or Street

Hydrography
- Major River or Stream

Infrastructure
- Gauging Station
- Water Tank or Source
- Historic Locations

Land Ownership

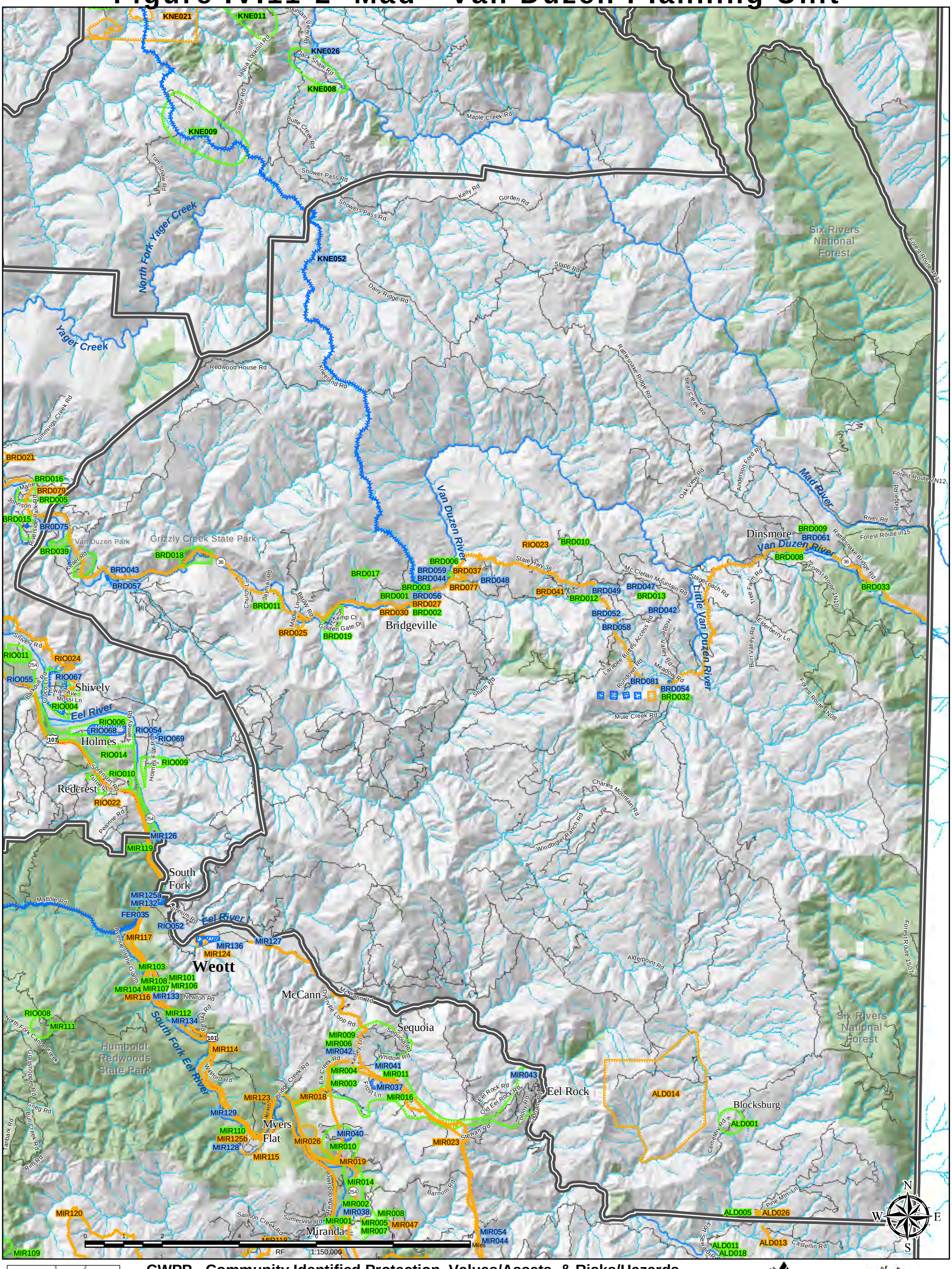
AGENCY
- Bureau of Land Management
- National Park Service
- State Park or Other State Lands
- Six Rivers National Forest
- U.S. Fish and Wildlife Service
- Tribal Lands
- Private
- Industrial Timber
- Cities

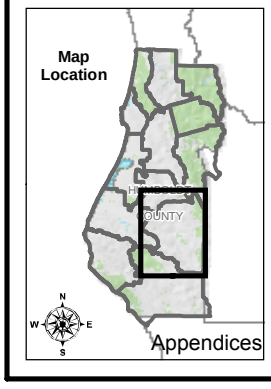
Land ownership and infrastructure data has been compiled by The County of Humboldt. Fire planning features identified at community workshops by residents; local, state, and federal fire service personnel; and Humboldt County staff. Other data sources were the 2006 Humboldt County Master Fire Protection Plan

This map is intended for planning purposes and should not be used for precise measurement or navigation.

Map compiled by County of Humboldt, March 2013
Online maps visit: http://gis.co.humboldt.ca.us
Contact: cimmit@co.humboldt.ca.us or jvondohlen@co.humboldt.ca.us

Figure IV.11-2 Mad - Van Duzen Planning Unit





CWPP - Community Identified Protection, Values/Assets, & Risks/Hazards

Legend

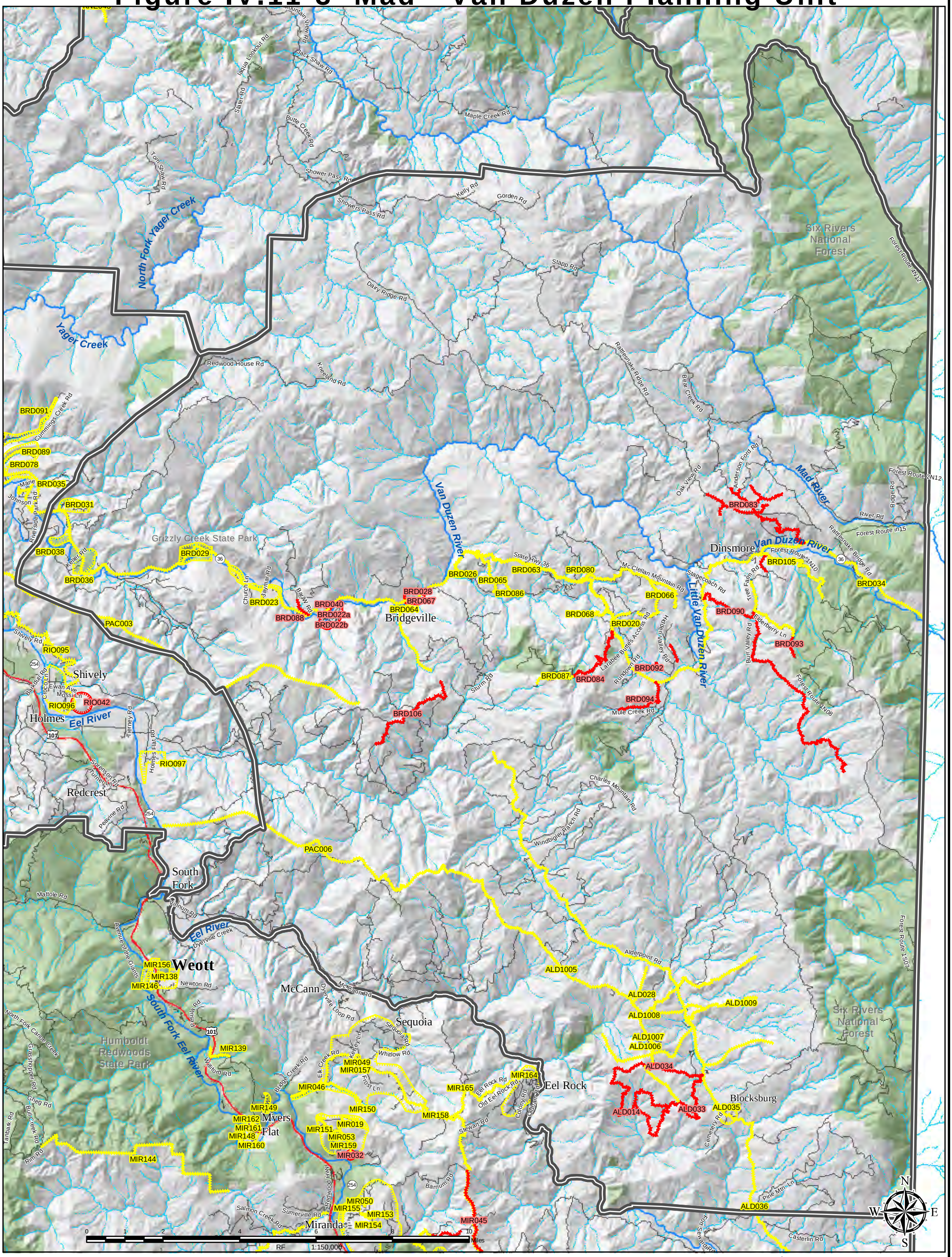
- CWPP Planning Unit Boundary
- **Community Identified Features**
  - Protection
  - Value/Asset
  - Risk/Hazard
- **Land Ownership**
  - Public Lands
  - Cities
- **Highways and Roads**
  - HWY 101
  - State HWY
  - HWY or Secondary Road
  - Local Road or Street
- **Hydrography**
  - Major River or Stream
  - Perennial Stream
  - Intermittent Stream

Land ownership and infrastructure data has been compiled by The County of Humboldt. Fire planning features identified at community workshops by residents; local, state, and federal fire service personnel; and Humboldt County staff. Other data sources were the 2006 Humboldt County Master Fire Protection Plan

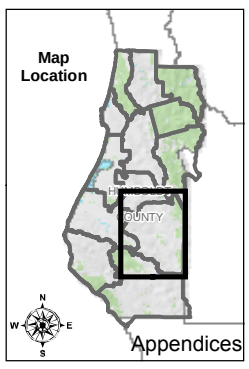
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Contact: cimmit@co.humboldt.ca.us or jvondohlen@co.humboldt.ca.us

Figure IV.11-3 Mad - Van Duzen Planning Unit



CWPP - Community Identified Projects



Legend

- CWPP Planning Unit Boundary
- **Community Identified Projects**
  - Proposed Project
  - Treated Project
- **Land Ownership**
  - Public Lands
  - Cities
- **Highways and Roads**
  - HWY 101
  - State HWY
  - HWY or Secondary Road
  - Local Road or Street
- **Hydrography**
  - Major River or Stream
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Land ownership and infrastructure data has been compiled by The County of Humboldt. Fire planning features identified at community workshops by residents; local, state, and federal fire service personnel; and Humboldt County staff. Other data sources were the 2006 Humboldt County Master Fire Protection Plan

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Contact: cimmit@co.humboldt.ca.us or jvondohlen@co.humboldt.ca.us

IV.12. Mattole-Lost Coast Planning Unit Action Plan

IV.12.1. Mattole-Lost Coast Planning Unit Description

The Mattole-Lost Coast *Planning Unit* encompasses 200,563 acres situated in the southwestern coastal region of Humboldt County, located west of the Humboldt Redwoods State Park. Although no major highways exist in the Unit, Mattole Road comprises the primary transportation corridor, leading from Cape Mendocino in the northern section of the Unit to the town of Petrolia, and continuing in a south-easterly direction toward Honeydew. The Unit is part of the Mattole *watershed*, which is characterized as "an extremely geologically active and unstable watershed."[1] The terrain is mostly mountainous with steep valleys formed by *tributaries* of the Mattole River. The Mattole River comes into the Unit south of Honeydew, flows alongside Mattole Road, and joins the Pacific Ocean just south of Petrolia.

The towns of Petrolia and Honeydew comprise the central communities of this Planning Unit, with populations of about 400 and 1,000, respectively. Other smaller neighborhoods are scattered throughout the Unit as well, mainly near Mattole Road, including: Wilder Ridge, Panther Gap, Windy Nip/Doreen Drive, Green Fir/New Jerusalem, Conklin Creek, Lower North Fork, Lighthouse Road, and Prosper Ridge.[2]

Private lands comprise the dominant ownership pattern in this Unit; these include residential parcels, medium- to –large tracts of ranchland, and a few timber harvest operations in the northern portion of the Unit. The majority of the residential properties are clustered in, around, and in between the towns of Petrolia and Honeydew. Several developed properties are also distributed in the southern region, along Wilder Ridge Road. This Unit contains a large portion of land belonging to the Bureau of Land Management (BLM)--The King Range National Conservation Area--which dominates the southwestern quadrant of the Unit. The Conservation area is an environmentally significant area managed by the Arcata Field Office, which is responsible for the administration of natural resources, lands, and mineral programs.[3] A map of this planning unit can be viewed in Figure IV.12-1. Mattole-Lost Coast Unit: CWPP Unit Map.

IV.12.2. Mattole-Lost Coast Community Process Summary

A community workshop was held on March 25, 2012 in Petrolia for the purpose of gathering local information and garnering public input regarding various factors contributing to the extent of wildfire risk and/or preparedness among the communities in this Unit, and to provide information about the countywide community wildfire protection plan (CWPP) update process. It was attended by approximately 30 community members, and functioned as a brunch fundraiser for the Lower Mattole Fire Safe Council. The meeting also celebrated Petrolia having earned national recognition as a Firewise community.

A group exercise, which involved maps of the Planning Unit area, invited those present to help identify and pinpoint on the map where particular *fire hazards* exist, the location of *protection resources*, such as fire water drafting sites, as well as values and *assets at risk* within the community that could be threatened by wildfire. These workshop processes also provided an opportunity for participating community members to ask questions and provide information based on their local knowledge.

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[1] Firewise Communities/USA Recognition Program. (2011). Petrolia Community Assessment. (p. 4.)

[2] Lower Mattole Fire Safe Council. (2012). *2012 Lower Mattole Community Wildfire Protection Plan (CWPP).*[Draft]. (p.14.) Petrolia, CA.

[3] Lower Mattole Fire Safe Council. (2012). *2012 Lower Mattole CWPP* [Draft]. (p. 18.)

Participants were also asked to review pre-existing information illustrated on the maps which had been added by community members during similar workshops that took place during the initial planning process in 2006. This workshop and mapping exercise also facilitated discussion among community members about potential actions that could be taken to reduce fire risk in their communities. Through discussion and collaborative processes, participants identified major hazard areas and compiled lists of project proposals for enhancing their communities' fire preparedness.

The community-identified fire hazards, protection resources, and values and assets at risk discussed throughout the following sections of this Planning Unit Action Plan reflect information generated by these community workshop mapping exercises, as well as information resulting from direct outreach to local fire departments and residents.

The project proposals resulting from community member discussions are contained in section IV.12.8. Community-Identified Projects in this Planning Unit Action Plan.

IV.12.3. Mattole-Lost Coast Wildfire Environment

Approximately 90% of the Mattole-Lost Coast Planning Unit is zoned "High *Fire Hazard Severity*," as determined by the California Department of Forestry and Fire Protection (CAL FIRE).[4] However, 3% of the Unit, including some locations near Petrolia and along portions of Mattole Rd. are zoned "Moderate Fire Hazard Severity," while approximately 7% of the Unit, including sections of the King Range National Conservation Area and land surrounding the Lighthouse and Prosper Ridge neighborhoods, are zoned "Very High Fire Hazard Severity."

The Unit is characterized as a Mediterranean climate, with cool, wet winters with high runoff, and dry, warm summers with greatly reduced river flows. Most of the lower river area is choked with *sediment*, which reduces its capacity to support fish and other aquatic organisms. About 84% of the Mattole watershed is forested; [5] forests types predominately include Douglas-fir, as well as hardwood forests, mixed hardwood and *conifer forests*, and a relatively small number of redwoods. The majority of the remaining, non-forested area is comprised of annual grasslands. Various brush and coastal shrub species are also mixed into grasslands and forests; these can contribute to *fire risk* by creating *fuel ladders* into the forest *canopy*. Conversely, grasslands with low levels of thatch can sometimes act as helpful *firebreaks* during forest fires.

Traditionally, fire has been an integral part of the *ecosystems* in this region. Forest management by indigenous tribes included low-intensity, intentional burns to help enhance forest ecosystems and prevent the accumulation of high *fuel loads*. Some of the early settlers in the late 1800s also used intentional burning to maintain grasslands for pasture animals. However, a heavy *fire suppression* campaign beginning in the 1940s has disturbed the fire-adapted ecosystems within this Unit and altered *stand composition*. Intense timber harvests, which were followed by the land being sold and subdivided during the 20th century further exacerbated damages to forest ecosystem health: "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 Mattole today."[6] These heavy fuel loads allow small fires that would otherwise burn through the *understory* to reach into the tree tops, increasing the likelihood of wildfires destroying whole trees and swaths of forest. The extent that the *landscape* has been altered as a result of fire suppression is reflected in the *condition class* of the Unit area. Condition class

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[4] CAL FIRE (California Department of Forestry and Fire Protection). (2007). *Fire Resources Assessment Program (FRAP).* [Map showing Fire Hazard Severity Zone ratings within various geographic areas, mapped by county]. Fire Hazard Severity Zones Map. Retrieved from http://frap.cdf.ca.gov/

[5] Lower Mattole Fire Safe Council. (2012). *2012 Lower Mattole CWPP* [Draft]. (p. 27.)

[6] Lower Mattole Fire Safe Council. (2012). *2012 Lower Mattole CWPP* [Draft]. (p. 23.)

describes the degree of departure from the historical *natural fire regime*. Where the condition class indicates that fire has been absent for an unnaturally long time, the hazard and potential damages are high to both the environment and human developments in the area. Approximately 50% of the Mattole-Lost Coast Planning Unit is condition class 3, meaning the fire regime is significantly altered from the historical range; and approximately 18% of the area is condition class 2, or moderately altered from the historical range.

Fortunately, there have been few major fire events in recent years. A few exceptions include:

- Honeydew Fire, September 2003: 11,793 acres.
- Spanish Fire, 2011: 524 acres.

Major fires between the years of 1980-1999 included:

- Rainbow Fire, August 1990: 2,757 acres.
- Mattole Fire, August 1990: 4,875 acres.
- Kings Fire, August 1990: 3,069 acres.

Humans are the primary *ignition sources* for fires in this Planning Unit, with "equipment use" being the dominant cause of fire starts. Other human-caused *ignitions* include *debris burning*, smoking, campfires, playing with fire, and arson. Human-related causes such as vehicles and downed power lines are also potential ignition sources. The majority of human-caused ignitions occur in populated areas and near major transportation corridors. Lightning is the leading natural cause of fire starts in this region. Other factors that are likely to have a future impact on fire risk within this Unit include: large fuel increases resulting from the spread of *Sudden Oak Death*, which has already been detected in areas of the Mattole watershed; climate change, which is likely to extend the dry season when fire risk is greatest; as well as probable earthquakes, since the Mendocino Triple Junction (where three tectonic plates meet) is just offshore from the Mattole Watershed.[7]

High potential for *structural ignitability* is a concern for many communities in this Unit. The degree to which residents maintain *defensible space* around their homes varies greatly from house to house among the neighborhoods, which can limit the ability of firefighters to ensure the safety of structures. Many houses have dense vegetation growing in the *home ignition zone* or ladder fuels surrounding trees close to roofs. Another common issue is the buildup of highly flammable debris such as leaves, needles, and moss, on rooftops or in gutters. Flammable roofing and sliding is also a concern for homes in this area. "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."[8] Furthermore, communities in this Unit exist in the *wildland-urban interface* (WUI), which increases the likelihood that *structural fires* will spread into the wildlands, and vice versa. Figure IV.12-2 found at the end of this Planning Unit Action Plan illustrates risks and hazards identified by community members at public workshops and can be used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt County Web GIS Portal, "Fire Planning" section: http://gis.co.humboldt.ca.us/.

Mattole Rd. is the central *ingress and egress* route, along with Wilder Ridge Rd., with numerous smaller roads connecting residences and neighborhoods to it. Some neighborhoods in this Unit are very remote and contain homes that are only accessible via narrow, steep, dirt roads, some of which have no alternative exit route. Poor or complete lack of *signage* at roads and intersections pose potential problems for emergency ingress and egress; this is especially true for

[7] Lower Mattole Fire Safe Council. (2012). *2012 Lower Mattole CWPP* [Draft]. (pp. 41-44.)

[8] Lower Mattole Fire Safe Council. (2012). *2012 Lower Mattole CWPP* [Draft]. (p. 47.)

more remote residences that are further from the towns. The narrowness of smaller roads leading to these remote residences could create serious complications for emergency vehicle response trying to gain access during simultaneous home evacuations. Routes may also be grown over with vegetation, and many properties have inadequate *turn around spaces*. The potential for landslides in this area could also inhibit access.

A lack of available water for fire protection is a very serious issue in this Planning Unit. There are no municipal water services or hydrants in this Unit, and residents must obtain water through other means, such as drawing from nearby creeks and holding tanks. Water availability is a limiting factor for the safety of many neighborhoods in this Unit, particularly the more remote communities. Although a few community water tanks have been placed in these neighborhoods, their contents can fall short of what is anticipated for fire suppression needs and firefighters are often challenged by a shortage of *fire protection water*. Ensuring that existing water tanks are maintained and functioning properly must be made a high priority for community members in these neighborhoods.

The only community-identified water source for this Planning Unit is a *drafting site* on the Bear River near Capetown. Fire protection water may be drafted from the Mattole River. However, this has become problematic in late summer months because of the impact that withdrawing water from the river can have on *endangered* salmon and steelhead populations.

The map in Figure IV.12-2 found at the end of this Unit Action Plan illustrates drafting sites as well as other community-identified wildfire *protection resources*. The map can be used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt County Web GIS Portal, "Fire Planning" section: http://gis.co.humboldt.ca.us/.

IV.12.4. Mattole-Lost Coast Values and Assets at Risk

Assets at risk can be defined as those things that are important to quality of life that can be threatened with destruction or loss from wildfire. These may include community assets such as homes and businesses, as well as environmental values such as wildlife habitat, natural resources, and air quality, along with any other important attribute that individual communities rely on for their well being. Loss or damage to community assets as a result of wildfire can have short- or long-term impacts of varying severity, depending on the asset. Short-term loss caused by a wildfire can include the destruction of residences, commercial assets, timber, wildlife habitat, scenic vistas, and *watersheds*. Long-term effects may include displaced persons, smaller timber harvests, reduced access to affected recreational areas, and destruction of cultural, ecological, and economic resources, and community infrastructure.

The majority of *assets at risk* in this Planning Unit are residential homes and communities, along with a variety of commercial and service industries, community centers, medical clinics, schools, fire stations, churches, as well as infrastructure components, such as power lines and *access roads*. The map in Figure IV.12-2 found at the end of this Unit Action Plan illustrates values and assets at risk to wildfire identified by community members at public workshops. The map can be used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt Web GIS[9] Portal, Fire Planning section: http://gis.co.humboldt.ca.us/. Some of the community-identified assets at risk within this Unit include:

- Mattole Salmon Group offices
- Mill Creek Forest
- Mt. Pierce – Communications Site
- Mattole Resort
- Yellow Rose
- Old South Maid Ranch House – historical site

[9] Geographic Information Systems (GIS).

Significant recreation areas in the Unit include the Mattole Campground and the A.W. Way County Park. Shell mounds comprise areas of environmental and cultural significance to some communities in this Unit as well. The Mattole River has important ecological significance as the Unit's primary freshwater body, which drains directly into a State-designated Area of Special Biological Significance, Critical Coastal Area, and Marine Protected Area. *Sensitive and listed species* in this region include: Steelhead Trout, Chinook Salmon, Coho Salmon, martens, fishers, and northern spotted owns, to name a few. [10]

Hardwood and coniferous forests are assets within this Unit as well; they are valuable for subsistence, commercial livelihood, and ecological resources. Some areas, especially near Wilder Ridge, contain many of the last remaining old-growth forests in the Mattole Watershed.[11]

IV.12.5. Mattole-Lost Coast Community Preparedness

Fire awareness within communities in this Unit is abetted by the *Lower Mattole Community Wildfire Protection Plan* (LM CWPP), which was collaboratively developed with involvement from local, state, and federal land and fire management agencies, as well as officials from CAL FIRE, State Parks, the Mattole Restoration Council (MRC), and from the Lower Mattole *Fire Safe Council* (LMFSC). This Plan is an updated version of the Lower Mattole Fire Plan, which was developed in 2001. The updated CWPP was completed in 2012 and is intended to provide resources and tools to help communities develop strategies for *fire safe* land management practices and *fuels reduction*, improve emergency communication and response systems, and outline possible future projects and funding sources. The plan identifies and prioritizes areas for *hazardous fuel reduction treatments*, and recommends treatment methods, as well as measures for reducing the potential for structural ignitions.

The LMFSC was founded in 2002 and aims 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."[12] Some of their goals and objectives include: reducing fuel loads in and around neighborhoods; increasing availability of water sources; assisting local fire protection agencies; educating landowners on fire-safe practices; improving community and emergency response communication networks; and promoting healthy forest and rangeland ecosystems. The LMFSC can be reached by calling (707) 629-3514, or by email at: firesafe@mattole.org.

Since its inception, the LMFSC has also partnered with the MRC on fuels reduction and fire safety projects. These entities have utilized the *Fire-adapted Landscapes and Safe Homes (FLASH) program* in an ongoing effort to assist community members with wildfire mitigation efforts. FLASH is a rebate program that reimburses property owners for *hazardous vegetation management* completed around their homes, along access routes, and in particularly hazardous areas. Between 2010 and 2011, over 138 acres were treated under the FLASH program and 92 site visits including a home *risk assessment* were conducted by FSC/MRC staff. The program has received additional funding for 2012-2013 and the goal is to treat approximately 75 additional acres by mid 2013.

Petrolia and Honeydew both received national *Firewise* recognition in 2011. The Petrolia Firewise Area includes the town of Petrolia, as well as sections of Mattole Rd. to the north and

[10] Mattole River and Range Partnership. (2009, August). *Mattole Integrated Coastal Watershed Management Plan; Foresight 2020.* Retrieved from http://www.mattolesalmon.org/joomla/images/stories/Documents/Reports/MSG/SOS/MICWMP_090901.pdf

[11] Lower Mattole Fire Safe Council. (2012). *2012 Lower Mattole CWPP* [Draft]. (p. 50.)

[12] Lower Mattole Fire Safe Council. (2012). *2012 Lower Mattole CWPP* [Draft]. (p. 16.)

southeast of Petrolia, a portion of Conklin Creek Rd., and the Lighthouse Rd. neighborhood. Successful Firewise modifications around Petrolia include: improving signage—some residents had been unaware of their own address numbers but have since figured them out from the County and constructed road signs as well; fuels reduction along roads and in neighborhoods; and increasing water storage tanks in the area.[13]

The Honeydew Firewise Area includes the town, areas to the north and east of the town, along Bull Creek Rd. and Applewood Rd., a large portion of Mattole Rd. to the west, and the Wilder Ridge Rd. neighborhood to the south. Some Firewise modifications accomplished within the community include: improving defensible space around homes, posting clearly marked addresses and water storage signs, and fuels reduction along roads and in neighborhoods.[14]

Two emergency communication resources exist in this Planning Unit as well: a Neighborhood Emergency Service Teams (NEST) list, and California Office Emergency Management Agency representatives. The NEST list was generated after an earthquake in 1992 to provide a structure for emergency communication in and around Petrolia. There is, however, a need to expand NEST to include the communities of Honeydew and Ettersburg, which is located just south of the Planning Unit boundaries. There are also two California Office Emergency Management Agency representatives: one in Petrolia, and one near Honeydew. "Through the NEST and the local VFD's, the [California Office Emergency Management Agency] representatives are the line of communication between emergency community needs and the [California Office Emergency Management Agency]."[15]

IV.12.6. Mattole-Lost Coast Wildfire Protection Capabilities

Community fire protection within the Unit is provided by the Petrolia *Volunteer Fire Department* (PVFD), which services the Petrolia *Fire Protection District*, and the Honeydew *Volunteer Fire Company* (HVFC). These entities provide protection from structural and wildland fires, as well as medical and rescue services.

The PVFD has 25 volunteer firefighters who provide service to approximately 500 residents and respond within a 150 square mile area. The PVFD's *apparatuses* include: a 2,100-gallon water tender; a type-1 engine with a 750-gallon capacity, two type-3 engines that carry 500 gallons; an all-terrain vehicle (ATV) with a winch; an ambulance-type medical rescue van; and a four-wheel drive quick attack pick-up truck with a 50-gallon tank. The PVFD can be reached by calling (707) 629-3558, by email at: petroliafire@frontier.net, or by visiting their website at: www.petroliavfd.com.

The HVFC was established in 1987 and is served by 14 volunteer firefighters. The HVFC does not currently have the tax-based support of a fire protection district, so their income is based on voluntary contributions from community members. The HVFC has no formal district boundaries; however, they serve approximately 350 residents in a *response area* of nearly 100 square miles, much of which is rugged and isolated, which can present challenges for emergency response. The HVFC's apparatuses include: three type-4 wildland "quick attack" engines and one 500-gallon water tender. [16] The HVFC is in need of new emergency response vehicles and better storage areas for them. The HVFC can be reached by calling (707) 373-4631.

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[13] Firewise Communities/USA Recognition Program. (2011). *Petrolia Community Assessment.*

[14] Firewise Communities/USA Recognition Program. (2011). *Honeydew Community Assessment.*

[15] Lower Mattole Fire Safe Council. (2012). *2012 Lower Mattole CWPP* [Draft]. (p. 63.)

[16] County of Humboldt, Natural Resources Planning. (2012). *Humboldt County Fire Chiefs Association Annual Report, 2010*. Humboldt County Fire Safe Council. Retrieved from http://www.co.humboldt.ca.us/natural-resources/fire_safe_council/fireserviceannualreport.aspx

Mutual aid agreements are in place with neighboring jurisdictions, such that all local departments often respond to calls inside and outside of their response areas. However, due to the rural nature of the area, additional help can take a long time to reach its destination. CAL FIRE also responds to wildland fires in the Unit, but the Mattole station is only in operation during declared *fire season*, which usually begins in June and lasts through October. The CAL FIRE Weott station can also send equipment and personnel to the Unit area when extended service is needed. Response times from the Weott station often require 45 minutes or more, depending on the location of the incident.

Fire protection agencies in this Unit are benefited by convenient access to helpful and pertinent information, which is compiled in the Fire Atlas for the area. "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."[17]

IV.12.7. Mattole-Lost Coast Evacuation

Evacuation from the Mattole-Lost Coast Planning Unit will travel either northwest or southeast along Mattole Rd., or south on Wilder Ridge Rd., depending on law enforcement recommendations based on *fire behavior*, wind pattern, traffic, and ingress of emergency vehicles. There are numerous smaller roads connecting residences to neighborhoods on Mattole Rd. Adequate ingress and egress along these roads is vital to a large portion of the community that may need to access the main *evacuation route* and for firefighters who will be using the roads to access wildfires burning in up-slope areas.

"Many roads are not maintained properly to allow access to firefighting apparatus, nor are they labeled with address or water storage."[18] Some neighborhoods are only accessible via steep, narrow dirt roads with few *turnouts*. These road conditions can severely hinder fire engine *response time*, such that some homes in these neighborhoods can take between 30 minutes to an hour to reach from the pavement. *One-way-in and one-way-out roads* are a concern for many residences as well. Neighborhoods most at risk from poor road access include: Panther Gap, Windy Nip, Wilder Ridge, and Prosper Ridge.[19]

Evacuation impediments may include: landslides, fallen trees, downed power lines, ignition of roadside fuels, overgrown vegetation, poorly marked streets and intersections, and one-way-in, one-way-out roads that could inhibit evacuation and emergency response vehicles, or leave residents stranded should the roads become blocked.

During wildfire events that have the potential to threaten personal safety, community evacuation sites may be established where residents can go to survive a wildfire. Evacuation sites will be established in different locations depending on the anticipated path of the wildfire. The determination for the location of these sites is normally made by Humboldt County Emergency Operations Center Incident Commander in cooperation with an *Incident Management Team*. The Humboldt County Sheriffs and Emergency Officials will use mass communication and door-to-door methods to inform residents about the threat and where residents should go to take shelter.

If a catastrophic event occurs, residents may not be able to reach designated evacuation sites. In such cases, residents may need to make decisions on their own about seeking shelter where they can survive the passage of the wildfire until they can reach an evacuation site. It can be very difficult to determine the right thing to do as the fire approaches. Before a wildfire threatens,

[17] Lower Mattole Fire Safe Council. (2012). *2012 Lower Mattole CWPP* [Draft]. (p. 60.)

[18] Firewise Communities/USA Recognition Program. (2011). *Petrolia Community Firewise Assessment.*

[19] Lower Mattole Fire Safe Council. (2012). *2012 Lower Mattole CWPP* [Draft]. (pp. 50-59.)

community members should talk to their local fire department about evacuation procedures in their neighborhood.

See section V.2.3 in Part V. Fire-Safe Communities for more information on preparing for safe evacuation and evacuation planning for pets and livestock. Also see section II.3.5 Evacuation Routes and Vulnerability in Part II. Risk Assessment for information about evacuation procedures and challenges in Humboldt County.

IV.12.8. Community Identified Potential Projects

The following section includes a summary of potential projects identified through the community processes discussed above. Some of the potential projects are illustrated on the community-identified projects map found at the end of this Unit Action Plan (Figure IV.12-3). This map includes projects carried over from the 2006 fire-planning process and those identified and refined during the 2011 LMFSC local CWPP and the 2012 County CWPP update process. In addition, Figure IV.12-2 illustrates community-identified Values and Assets, Hazards and Risks, and Wildfire Protection Resources. The maps in Figure IV.12-2 and Figure IV.12-3 can each be used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt Web GIS Portal, "Fire Planning" section: http://gis.co.humboldt.ca.us/.

Because of the tremendous amount of work that has been accomplished within this unit and the existence of a local CWPP, a project matrix was not included in this Unit Action Plan. All of the geographic community identified project information is cataloged in the Humboldt County Web GIS Portal described above as well as in the Lower Mattole CWPP. This County CWPP incorporates that information by reference here. This information will continue to be made available as a resource for capturing grant funds and continued project implementation tracking.

Project ideas are also listed that are not visible on the maps, because they are not geographically based. These proposed actions also add to and expand upon the 2006 plan, based on the 2012 process (including the County CWPP update, the local CWPP, and Firewise action plans). Because of the complexity of the planning process in this unit, the community identified potential projects are broken out into the following categories:

- CWPP Action Items,
- Firewise Action Items

CWPP Action Items:

The Lower Mattole CWPP lists and outlines various types of projects that have been proposed to improve fire safety in the area in a five to ten year action plan. These projects fall under the categories of:

- Empowering Residents
- Reducing Structural Ignitability
- Reducing Fuels
- Enhancing Fire Protection
- Community Emergency Preparedness and Planning
- Fire Ecology and Conservation/Restoration Efforts

The following summarizes the projects proposed in the Lower Mattole CWPP. A complete copy of the Lower Mattole CWPP, which includes the matrix of coded projects mentioned above, can be found on the MRC[20] and Humboldt County FSC[21] websites.

[20] www.mattole.org/

[21] http://www.co.humboldt.ca.us/natural-resources/fire_safe_council/

- **Empower residents** with information and resources to act on their own to increase their wildfire readiness and decrease fire hazards around their homes and in their communities. Provide workshops for community members and devise methods of involving local youth in fire hazard mitigation. Create opportunities for fire education.
- Take action to **reduce risk to structural ignitability**. Educate and make information available to residents and landowners about measures they can take to remove fuels on, near, or against structures and improve their defensible spaces.
- **Reduce flammable vegetation** in areas where there is high ignition risk, such as around structures, along roads, and on ridge tops. Continue utilizing the FLASH program to create new fuelbreaks, and to evaluate and maintain existing ones. Take steps to implement strategic management of fuels in such a way that helps restore fire ecology within the area.
- **Enhance fire protection** capability by maintaining and increasing firefighting water sources in the area. Similarly, increase the visibility of water sources and addresses and improve access for firefighting apparatus on local roads.
- Conduct **community emergency preparedness and planning** and enhance the Emergency Communication Systems. Expand the NEST phone tree area and diversify communication methods. Equip local emergency communication systems to handle a variety of emergencies. Educate community members about being prepared for evacuation.
- Take part in **fire ecology and conservation/restoration efforts** designed to restore fire to Mattole ecosystems without damaging natural and community resources.

Firewise Action Plan

The Firewise Action Plan, which resulted from the community Firewise assessment, contains a list of short-term actions with measurable objectives that can be done within the home ignition zone, within high risk community areas, and the community at large. These actions are consistent with implementation of the Lower Mattole CWPP. The following provides a summary of the projects proposed in the Firewise Action Plan:

- Have information available to residents about home fire safety in local stores and at local events.
- Continue fuels reduction projects through the FLASH program.
- Conjoin the annual Firewise event with the HVFC's annual fundraiser and staff an information booth at the event.
- Post road or driveway signs so they are clearly visible. Assist residents in figuring out their addresses, if necessary.
- Pursue funding to help install water tanks on properties and help residents acquire proper fittings for fire protection equipment.
- Keep the Fire Atlas up to date.

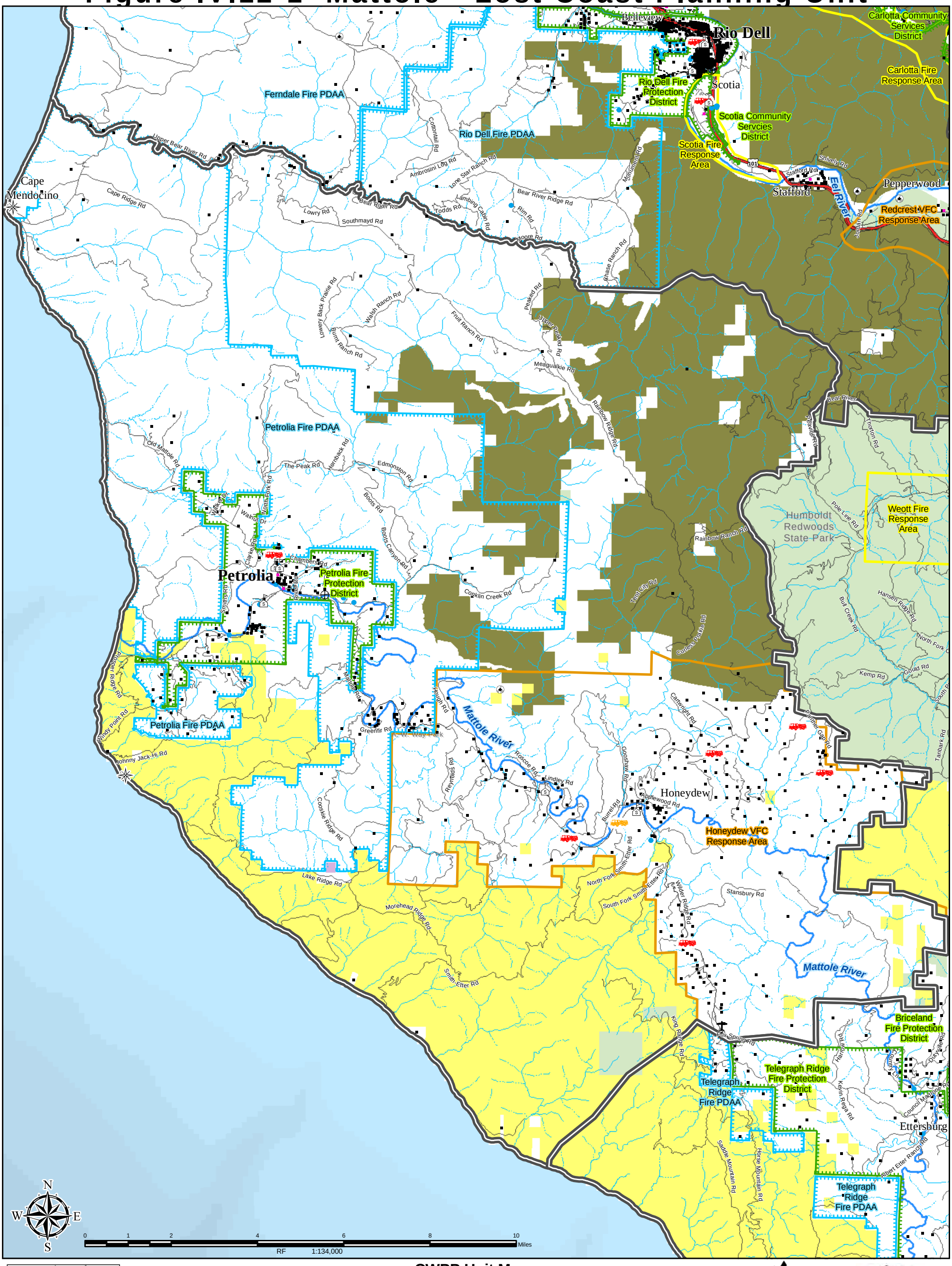
IV.12.9. Mattole-Lost Coast Action Plan

The following items are the initial priorities for community action for the Trinity Planning Unit as recommended by this Humboldt County CWPP (not listed in order of priority). In an ideal world, everything recommended here would be implemented. However, it must be understood that implementation will be subject to the availability of funds and other resources and the willingness/ability of community members and Plan Partners to take action. This Action Plan can be cited in grant applications to leverage needed implementation funds and used to guide and inspire action. No vegetation *treatments* recommended in this plan will be carried out without the

consent and involvement of the property owner and all applicable local, state and federal regulations must be observed.

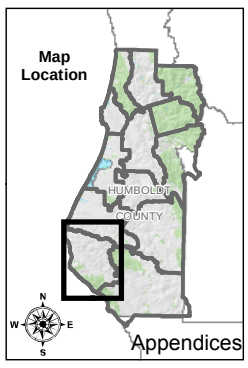
- Maintain and support the LMFSC to facilitate community wildfire preparedness and mitigation.
- Ensure that the LMFSC continues to be represented on the Humboldt County FSC.
- Maintain and support the PVFD and HVFC to provide community emergency services.
- LMFSC work with the PVFD and HVFC, the MRC, and other community groups to implement the priority projects from the Lower Mattole CWPP that are summarized above (also see the project matrix in the Lower Mattole CWPP as well as projects illustrated on the Web GIS Portal).
- LMFSC assist Petrolia and Honeydew to renew participation in the Firewise Communities/USA recognition program annually. This will include an annual update of the Firewise action plan, which can be used as a short-term LMCWPP implementation tool. Actively implementing and maintaining the Firewise action plan on an annual basis will take small bites out of the local CWPP which has a five to ten year planning horizon.
- Share GIS data sets between local representatives and County staff to maintain the projects included in the County Web GIS Portal.
- LMFSC, PVFD, and HVFC work with the Humboldt County Office of Emergency Services to engage community members in evacuation preparedness. Efforts should be made to ensure that local gates are open or accessible during Red Flag conditions.

Figure IV.12-1 Mattole - Lost Coast Planning Unit



CWPP Unit Map

Map Location



Legend

- CWPP Planning Unit Boundary

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

Local Fire Organization Response Area
- District
- Out of District
- Non-Tax (Volunteer Fire Company (VFC))
- Proposed District Annexation Area (PDAA)

Improved Parcels
- Improved Parcel (not actual location of improvement)
- Commercial or Industrial Lot (not actual location)

Airports
- Landing Strip

Highways and Roads
- HWY 101
- State HWY
- HWY or Secondary Road
- Local Road or Street

Hydrography
- Major River or Stream

Infrastructure
- Gauging Station
- Water Tank or Source
- Historic Locations

Land Ownership

AGENCY
- Bureau of Land Management
- National Park Service
- State Park or Other State Lands
- Six Rivers National Forest
- U.S. Fish and Wildlife Service
- Tribal Lands
- Private
- Industrial Timber
- Cities

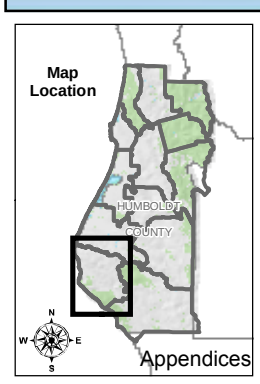
Land ownership and infrastructure data has been compiled by The County of Humboldt. Fire planning features identified at community workshops by residents; local, state, and federal fire service personnel; and Humboldt County staff. Other data sources were the 2006 Humboldt County Master Fire Protection Plan

This map is intended for planning purposes and should not be used for precise measurement or navigation.

Map compiled by County of Humboldt, March 2013
Online maps visit: http://gis.co.humboldt.ca.us
Contact: cimmit@co.humboldt.ca.us or jvondohlen@co.humboldt.ca.us

Figure IV.12-2 Mattole - Lost Coast Planning Unit





CWPP - Community Identified Protection, Values/Assets, & Risks/Hazards

Legend

CWPP PlanningUnit Boundary

Community Identified Features
- Protection/Evacuation
- Value/Asset
- Risk/Hazard

Land Ownership
- Public Lands
- Cities

Highways and Roads
- HWY 101
- State HWY
- HWY or Secondary Road
- Local Road or Street

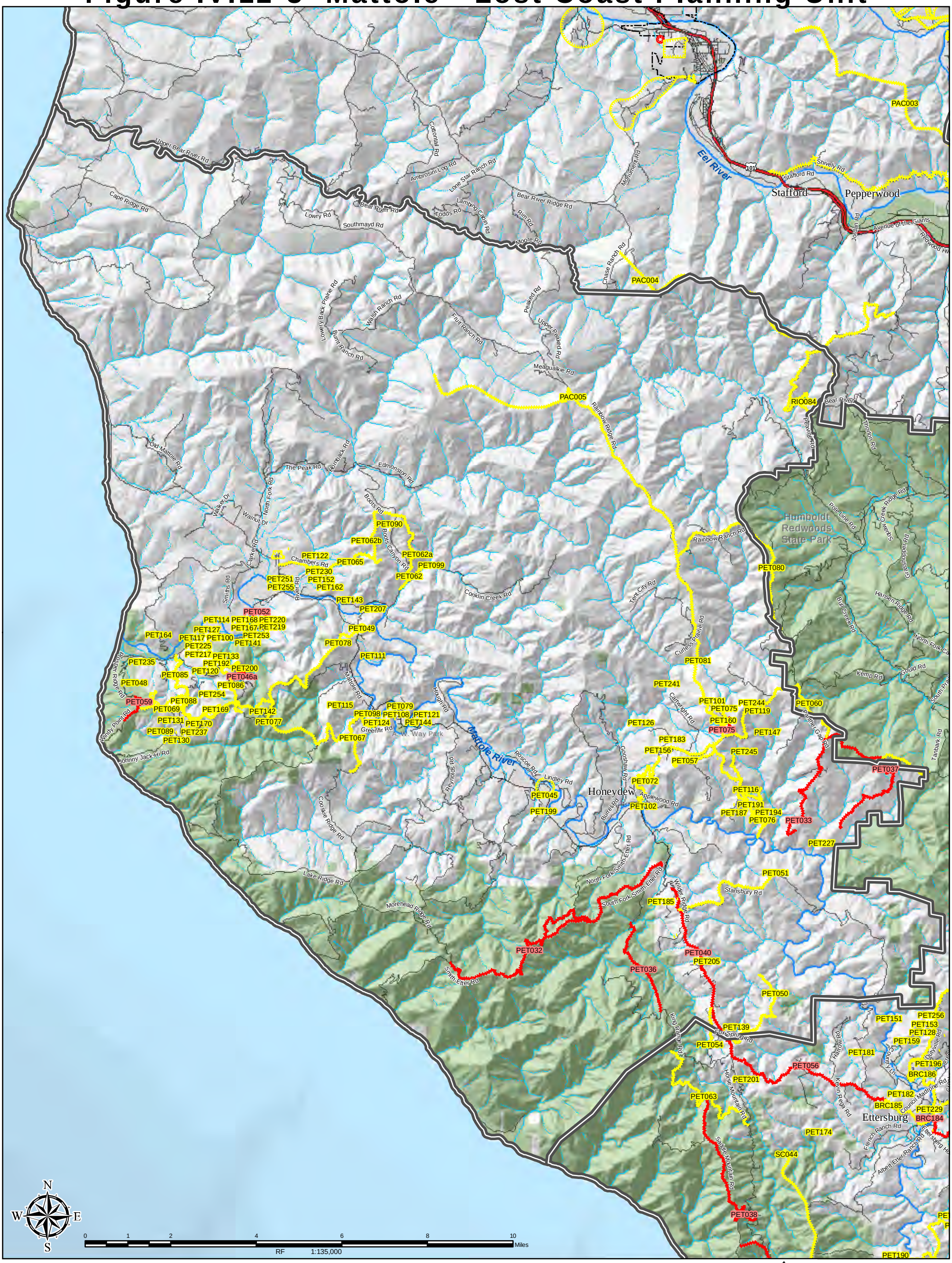
Hydrography
- Major River or Stream
- Perennial Stream
- Intermittent Stream

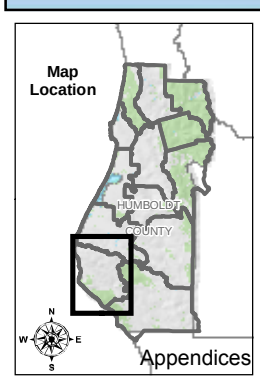
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Contact: cimmit@co.humboldt.ca.us or jvondohlen@co.humboldt.ca.us

Figure IV.12-3 Mattole - Lost Coast Planning Unit





CWPP - Community Identified Projects

Legend

CWPP Planning Unit Boundary

Community Identified Projects
- Proposed Project
- Treated Project

Land Ownership
- Public Lands
- Cities

Highways and Roads
- HWY 101
- State HWY
- HWY or Secondary Road
- Local Road or Street

Hydrography
- Major River or Stream
- Perennial Stream
- Intermittent Stream

Land ownership and infrastructure data has been compiled by The County of Humboldt. Fire planning features identified at community workshops by residents; local, state, and federal fire service personnel; and Humboldt County staff. Other data sources were the 2006 Humboldt County Master Fire Protection Plan

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Contact: cimmit@co.humboldt.ca.us or jvondohlen@co.humboldt.ca.us

IV.13. .Southern Humboldt Planning Unit Action Plan

IV.13.1. Southern Humboldt Planning Unit Description

The Southern Humboldt *Planning Unit* encompasses a huge portion of the southern half of Humboldt County, totaling 375,608 acres, with a wide range of land uses and geographical types. The town of Redcrest lies just north of the Unit, while Mendocino County borders the Unit to the South and Trinity County to the East. Much of the Unit is extremely rugged and difficult to access, with a series of four major northwest-trending ridges characterizing the terrain. The difficulty of accessing this remote coastal expanse has earned the region its "Lost Coast" moniker.

Highway 101 acts as the main transportation corridor through the Unit; the highway follows the inland valley formed by the path of the South Fork of the Eel River, which traverses the Unit in a north-to-south orientation and veers slightly westward as it continues north past Phillipsville. The main stem of the Eel River also passes through this unit from the south-east corner running north-west until it is joined by the South Fork Eel River at the town aptly named "South Fork". The Unit contains many *tributary watersheds* of the Eel River system as well. Significant tributaries of the South Fork Eel include: Salmon Creek, Dean Creek, Bull Creek, Redwood Creek, Sprowel Creek, and the East Branch South Fork Eel River. Significant tributaries of the main stem Eel include: Dobyn Creek, Steelhead Creek, and Jewett Creek.

The Unit also encompasses upper portions of the Mattole Watershed. The headwaters of the Mattole River are located just across the Humboldt County line in Mendocino County. The Mattole River runs through the western part of the Southern Humboldt Planning Unit in a south to north direction and enters the Mattole-Lost Coast Planning Unit just past Ettersburg. Some noteworthy tributaries of the Upper Mattole Watershed in this Planning Unit include: Gibson Creek, Harris Creek, Mill Creek, and Nooning Creek in the Whitethorn area; and Finley Creek, Blue Slide Creek, Mattole Canyon Creek, Grindstone Creek, and Bear Creek in the Ettersburg area. Many of these tributaries help distinguish the communities in this Planning Unit, and several roads and neighborhoods share the names of their nearby creeks.

The neighboring towns of Redway and Garberville comprise the community population center of this Planning Unit; however, the Unit area is populated with many distinct, widely dispersed communities. Several towns are clustered along Highway 101, from the southernmost town of Benbow, to Garberville and Redway, up to Phillipsville, Miranda, and Myers Flat, and up to the northernmost town of Weott. Many communities populate the land on either side of Highway 101 as well: South-east of Weott lies the small community of Eel Rock, with Fort Seward and Alderpoint even further to the south-east, and Palo Verde in the south eastern region, east of Benbow. Located west of the Garberville-Redway area are the communities of Briceland and Whitethorn; Ettersburg lies north of Whitethorn, with Shelter Cove tucked away into the southwestern corner of the Unit, amidst the King Range National Conservation Area. Whale Gulch is a community located in Mendocino County but primarily accessed from the Humboldt County side with its population orienting towards Redway and Garberville for services. Although Whale Gulch is not included in this countywide Community Wildfire Protection Plan (CWPP), it is a planning area within the Southern Humboldt CWPP and within the area of Southern Humboldt Fire Safe Council (FSC) activity (*learn more about the Southern Humboldt CWPP and FSC in "Community Preparedness" below*).

The Southern Humboldt Planning Unit contains a variety of land uses and ownership patterns, which include residential parcels, ranchlands of various sizes, lands managed by timber companies, state park areas, and swaths of Bureau of Land Management (BLM) land. About half of the King Range National Conservation Area exists within the Unit, bordering the coastline, while the northwestern portion of the Unit is dominated by Humboldt Redwoods State Park, which extends to Highway 101. The BLM manages a few other land areas as well, south of

Humboldt Redwoods State Park, and in the southeastern Unit area, near Palo Verde. Highway 254--known as the "Avenue of the Giants"-- parallels portions of Highway 101, from just north of Redway, up through the top of the Unit.

Richardson Grove State Park is situated in the southernmost part of the Unit, with lands owned by Barnum Timber to the west and the Benbow Lake State Recreation Area to the north. The majority of the western portion of the Unit--between Highway 101 and the King Range National Conservation Area--primarily includes rural residential parcels and small- to medium-sized ranchlands, while large tracts of ranchland dominate the eastern half of the Unit, with residential parcels distributed throughout. A map of this planning unit can be viewed in Figure IV.13-1. Southern Humboldt Unit: CWPP Unit Map.

IV.13.2. Southern Humboldt Community Process Summary

Two open-house community workshops were held within this Planning Unit for the purpose of gathering local information and garnering public input regarding various factors contributing to the extent of wildfire risk and/or preparedness among the communities in this Unit. One meeting was held on March 20, 2012 in Miranda and another was held on March 29, 2012 at the Healy Senior Center in Redway. A group exercise, which involved maps of the Planning Unit area, invited those present to help identify and pinpoint on the map where particular *fire hazards* exist, the location of *protection resources*, such as fire water drafting sites, as well as values and *assets at risk* within the community that could be threatened by wildfire. These workshop processes also provided an opportunity for participating community members to ask questions and provide information based on their local knowledge.

Participants were also asked to review pre-existing information illustrated on the maps which had been added by community members during similar workshops that took place during the initial planning process in 2006. These workshops and mapping exercises also facilitated discussion among community members about potential actions that could be taken to reduce fire risk in their communities. Through discussion and collaborative processes, participants identified major hazard areas and compiled lists of project proposals for enhancing their communities' fire preparedness.

The community-identified fire hazards, protection resources, and values and assets at risk discussed throughout the following sections of this Planning Unit Action Plan reflect information generated by these community workshop mapping exercises, as well as information resulting from direct outreach to local fire departments and residents. The workshops in Southern Humboldt fell short on time for the mapping exercise, so additional information was gathered from community members by Bill Eastwood, who is working on the area's CWPP.

The project proposals resulting from community member discussions are contained in section IV.13.8. Community-Identified Projects in this Planning Unit Action Plan.

IV.13.3. Southern Humboldt Wildfire Environment

Approximately 78% of the Southern Humboldt Planning Unit is zoned "High *Fire Hazard Severity*," as determined by the California Department of Forestry and Fire Protection (CAL FIRE).[1] Approximately 21% of the Unit, including much of the northeastern portion and areas surrounding Garberville and Shelter Cove zoned "Very High Fire Hazard Severity," with only about 1% of the Unit zoned "Moderate Fire Hazard Severity." The steep topography of the Unit can accelerate the rate of fires spreading throughout the region and can make access for firefighting *apparatuses* and personnel very difficult.

[1] CAL FIRE (California Department of Forestry and Fire Protection). (2007). *Fire Resources Assessment Program (FRAP).* [Map showing Fire Hazard Severity Zone ratings within various geographic areas, mapped by county]. Fire Hazard Severity Zones Map. Retrieved from http://frap.cdf.ca.gov/

The Unit is characterized by a Mediterranean climate with cool, wet winters and hot, dry summers, although the heat of summer is tempered by the coastal fog zone in some areas. Local *vegetation types* consist primarily of *conifer forests* and coastal redwoods, with Douglas-fir *dominant*. Madrone is also prevalent in the Unit, along with the Blue Blossom and Whitethorn species of Ceanothus, as well as Bay trees, which have been identified as key players in the spread of Sudden Oak Death.[2] Annual grassland prairies and oak woodlands cover a substantial portion of the Unit as well, particularly along ridge tops; oak species include: tan oak, black oak, white oak, and canyon live oak.

Traditionally, fire was an integral part of the *ecosystems* in this region. Forest management by indigenous tribes often included low-intensity, intentional burns that helped enhance forest ecosystems and prevent the accumulation of high *fuel loads*. Some of the early agricultural settlers in the mid-1800s used intentional burning to clear and then maintain grasslands for pasture animals. However, a heavy *fire suppression* campaign beginning in the 1940s has allowed the accumulation of dense, flammable vegetation in forest *understories*, which acts as *fuel* and increases the risk of high-intensity wildfires. Forest ecosystems, accustomed to low-intensity fires that would burn off *brush* and newer starts in the understory, become threatened by overcrowded forests and accumulated fuel. Intense timber harvests during the 20th century further exacerbated damages to forest ecosystem health. Encroachment of Douglas-fir, which was sewn into many logged areas, has contributed to alterations in *stand compositions* in redwood forests. Douglas-fir encroachment has also been witnessed in oak woodlands and grassland areas as well, threatening ecosystems, wildlife habitat, and negatively impacting the forests' *resiliency* to wildfire. The extent that the landscape has been altered as a result of fire suppression is reflected in the *condition class* of the Unit area. Condition class describes the degree of departure from the historical *natural fire regime*. Where the condition class indicates that fire has been absent for an unnaturally long time, the hazard and potential damages are high to both the environment and human developments in the area. Approximately 49% of the Southern Humboldt Planning Unit is condition class 3, meaning the fire regime is significantly altered from the historical range; and approximately 16% of the area is condition class 2, or moderately altered from the historical range.

Communities within the Southern Humboldt Planning Unit are increasingly vulnerable to damage from wildfire. The buildup of fuel has increased the potential for higher intensity of fires, loss of life and property, and higher wildfire suppression costs. The California Fire Alliance has listed many *communities at risk* within this Planning Unit. Furthermore, the increasing subdivision of timber- and ranchlands throughout the Unit area has generated an increase in the number of homes that exist in the *wildland-urban interface* (WUI), which increases the likelihood that *wildland fires* will spread to structures, and vice versa.

In 1973 a wildfire driven by Santa Anna winds burned 10,000 acres between Ettersburg and the ocean at Shelter Cove in ONE day! Fortunately the area was sparsely populated and damage was minimal. Today, Shelter Cove and nearby wildlands are heavily populated and the young brushy forest that has re-vegetated the burn area is now even more hazardous than it was in 1973. Hundreds of homes are gravely threatened. Many other communities within the Unit face similarly hazardous conditions.

Major fire events within this Planning Unit between the years 2000-2010 include:

- 10 Fire, 2003: 213 acres.
- Canoe Fire, 2003: 952.5 acres.
- Paradise Ridge Fire, 2008; 981 acres.

[2] *For more information about Sudden Oak Death in Humboldt County, see "Vegetation and Fuels" in section II.1.3. in Chapter II.1. Wildfire Environment.*

Several smaller fires occurred throughout the Unit during this period as well, including Colony Fire, Brown Fire, Pratt Fire, Casterlin Fire, and High Fire.

Humans are the most likely *ignition source* for fires in this Planning Unit. Vehicle accidents, smoking, playing with fire, poorly maintained *debris burning*, and incendiary burning are just a few potential causes. Various types of equipment use and downed power lines can also be potential ignition sources. Lightning is the most probable natural cause of fire starts within this Unit.

Dead plant matter and vegetation with low *moisture levels* within 100-150 feet of homesteads pose some of the greatest threats to *structural ignitability*. Of particular concern are houses with needles and leaves accumulating on rooftops or in rain gutters. Houses with wooden rooftops and sidings add to this risk, as do the presence of wooden decks, particularly those with dead plant matter accumulated beneath them. Figure IV.13-2 found at the end of this Planning Unit Action Plan illustrates risks and hazards identified by community members at public workshops and can be used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt County Web GIS Portal, "Fire Planning" section: http://gis.co.humboldt.ca.us/.

Highway 101 is the central *ingress and egress* route, and main roads such as Briceland Thorne Rd., Alderpoint Rd., and Dyerville Loop connect smaller communities and residential roads to the central highway. Poor or complete lack of *signage* at roads and intersections pose potential problems for ingress and egress; this is especially true for more remote residences that are further away from the main towns. Problems with poor signage are exacerbated by ambiguity of road names and partial addresses used throughout the Unit. The narrowness of smaller roads leading to remote residences could create serious complications for emergency vehicle response trying to gain access during simultaneous home evacuations. Routes may also be overgrown with vegetation, and many properties have inadequate *turn around spaces*. The potential for landslides in the area could also inhibit access.

Potable water and *fire protection water* are provided to the majority of communities in this Unit by a number of special districts; they include: the Garberville Sanitary District branch of the Garberville/Redway *Community Services District*, the Alderpoint County Water District, which covers approximately 370 acres,[3] the Shelter Cove Resort Improvement District, and the Weott Community Services District. Residents outside of these service districts obtain water through other means, such as drawing from nearby creeks and holding tanks. Creeks and swimming holes, such as Delta Hole, are also drawn upon by firefighters to *draft* water for fire protection. Some drafting locations in this Unit, as identified at community workshops, include the following (these will need to be vetted further with local firefighting personnel):

- Bear Creek
- Lauffer Ranch Ponds - dipping
- Holmes Flat Eel River drafting site
- McCann Eel River drafting site
- Barnes Pond - drafting
- Duggans Mill drafting spot
- George Bushnell Pond
- Culvert water source on West Moody Rd – Sprowel Creek
- Myers Flat Eel River drafting site
- Williams Grove Eel River drafting site
- Fort Seward – East Side River Access.
- Miller's Pond – Sprowel Creek
- Debra Lake Pond (150,000 gallons)
- Dyerville Bar Eel River drafting site
- Hans Ponds -drafting
- Heartwood Pool -- drafting

[3] Humboldt Local Agencry Formation Commission. (2009, January). *Alderpoint County Water District Municipal Service Review* [Draft]. Retrieved from http://www.humboldtlafco.org/sites/default/files/msr/Alderpoint_CWD_MSR_Jan_2009.pdf

The map in Figure IV.13-2 found at the end of this Planning Unit Action Plan illustrates these *drafting sites* as well as other community-identified wildfire *protection resources*. The map can be used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt County Web GIS Portal, "Fire Planning" section: http://gis.co.humboldt.ca.us/.

IV.13.4. Southern Humboldt Values and Assets at Risk

Assets at risk can be defined as those things that are important to quality of life that can be threatened with destruction or loss from wildfire. These may include community assets such as homes and businesses, as well as environmental values such as wildlife habitat, natural resources, and air quality, along with any other important attribute that individual communities rely on for their well being. Loss or damage to community assets as a result of wildfire can have short- or long-term impacts of varying severity, depending on the asset. Short-term loss caused by a *wildfire* can include the destruction of residences, commercial assets, timber, wildlife habitat, scenic vistas, and *watersheds*. Long-term effects may include displaced persons, smaller timber harvests, reduced access to affected recreational areas, and destruction of cultural, ecological, and economic resources, and community infrastructure.

The assets at risk in this Planning Unit are as diverse as the land uses within the region. The majority of community assets at risk include residential homes and neighborhoods, along with a variety of commercial and service industries, community centers, schools, fire stations, churches, historic sites, post offices, medical and dental clinics, municipal buildings as well as infrastructure components, such as water treatment plants and a communication site. The ranching, agricultural, and timber industries within the Unit are also considered assets at risk. The Unit also contains several campgrounds and RV Parks.

The map in Figure IV.13-2 found at the end of this Unit Action Plan illustrates values and assets at risk to wildfire identified by community members at public workshops. The map can be used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt County Web GIS[4] Portal, "Fire Planning" section: http://gis.co.humboldt.ca.us/. Some of the community-identified assets at risk within this Unit include:

- Garberville Airport
- Eel River Conservation Camp
- Kekewaka Power Station
- Fort Seward Train Station – historical
- Benbow State Park
- Beginnings Community Center
- Burlington Ranger Station/Visitor Center/RSP
- Pratt Mountain Lookout (cell, communication)
- Benbow Golf Course and Clubhouse
- Grasshopper Lookout

The Unit contains many areas of great environmental significance as well. The Avenue of the Giants, Richardson Grove, and Humboldt Redwoods State Park hold some of the last remaining *stands* of old growth redwoods in the county and, along with the King Range National Conservation Area, provide valuable *habitat* for wildlife species in the region. The Eel River South Fork and its tributaries are also ecologically valuable for the fisheries they support, including coho and chinook salmon, and steelhead trout. However, the ability of these populations to reproduce successfully has been negatively affected by heavy *sedimentation* in the river, which has been exacerbated by certain timber harvest practices and road building activities.[5] The river also provides numerous recreational opportunities for communities in the

[4] Geographic Information Systems (GIS).

5 Dyett & Bhatia. (2002, September). South Fork of the Eel River Watershed. *Humboldt 2025 General Plan Update: Natural Resources and Hazards; Vol. 2: Detailed Watershed Characteristics and Regulatory Framework Analysis.* Retrieved from http://www.co.humboldt.ca.us/gpu/documentsbackground.aspx.

Unit. Many culturally sensitive sites of special importance to Native Americans exist throughout the Unit as well.

IV.13.5. Southern Humboldt Community Preparedness

Communities within the Southern Humboldt Planning Unit are informed and abetted by the Southern Humboldt *Fire Safe Council* (SHFSC), which operates throughout the entire Unit. The SHFSC was formed in 2002 by residents in the region who recognize the potential for community devastation by wildfire; their mission is: "to protect the region's natural and manmade resources by mobilizing our community to make their homes, neighborhoods, and communities fire safe."[6] The SHFSC meets irregularly and participation has been widespread throughout the Unit, with more than forty individuals including representation from the following fire departments: Briceland, Telegraph Ridge, Sprowel Creek, Palo Verde, Whale Gulch, Shelter Cove, and Salmon Creek. Participation also includes personnel from CAL FIRE, BLM, California State Parks, the Mattole Restoration Council (MRC), and the Humboldt County Planning Department. In addition to protecting resources, the SHFSC's goals include: reducing the risk negative impacts by wildfire, increasing community preparedness and fire planning, creating jobs through *fuels reduction* projects, utilizing materials from *hazardous fuel reduction* efforts, and improving forest health and ecosystem functioning. Their focus goes beyond wildfire concerns and includes public safety issues such as earthquake preparedness and emergency medical response as well. The SHFSC can be reached by calling (707) 923-9109 or (707) 845-3282, or by visiting their website at: http://www.newforestry.org/shfsc/.

The SHFSC has been successful in collaborating with a variety of fire and forestry organizations to achieve its goals; these organizations include: Beginnings Inc., the Institute for Sustainable Forestry, Ancient Forest International, Sanctuary Forest, and the Humboldt Fire Chiefs Association, with cooperation from the California Department of Forestry and Fire Protection's Garberville Battalion Chief and other personnel from CAL FIRE's Humboldt-Del Norte Unit in Fortuna as well. Some of the SHFSC's primary objectives are to educate the public about fire safety, create extensive *fuelbreaks*, initiate a *prescribed burning* program, increase communication among residents as well as *volunteer fire departments* (VFDs) improve training for emergency response teams, and to conduct fundraising for these efforts. The SHFSC also attempts to coordinate their activities with other fire prevention efforts by networking with entities such as the BLM, the MRC, and the California Conservation Corps. Since 2004, the SHFSC has completed *shaded fuelbreak* projects along Salmon Creek Rd., Bell Springs Rd., Perry Meadow/Elk Ridge Rd., and King's Peak Rd.

Collaboration with the Institute for Sustainable Forestry and the Mattole Restoration Council has led to the implementation of the *Fire-adapted Landscapes and Safe Homes (FLASH) program* throughout the Unit area. FLASH is a rebate program that reimburses property owners for *hazardous vegetation management* completed around their homes, along *access routes*, and in particularly hazardous areas. Between 2010 and 2011, over 41 acres were treated under the FLASH program and 27 site visits including a home *risk assessment* were conducted by FSC staff. The program has received additional funding for 2012-2013 and the goal is to treat approximately 53 acres.

The SHFSC and Institute for Sustainable Forestry are also in the process of producing a locally focused *community wildfire protection plan* (CWPP). Participants in this process are working to identify local and area wide needs through meetings in neighborhoods and with local fire chiefs. The purpose of this plan is to help educate and assist residents in the Unit area with information and resources for better fire planning and emergency preparedness.

[6] Southern Humboldt Fire Safe Council. (n.d.). *Mission Statement*. Retrieved September 9, 2012, from http://newforestry.org/shfsc/aboutSHFSC.htm.

The Crooked Prairie Fire Safe Council (CPFSC) also exists within this Planning Unit. Located in the Ettersburg area, the CPFSC encompasses approximately four square miles with about 30 homesteads. It was established in 2005 as the result of the dissolution of the Crooked Prairie Fire Crew. The organization of the CPFSC is intentionally small and simple; it is an all-volunteer group that meets approximately once a year and obtains all of its funding from donations and fundraisers. Though small, they have been capable of some major contributions to improving fire safety in their community. Some of their activities and accomplishments include: installing a 5,000 gallon water tank adjacent to a firehouse with a grant acquired through the MRC; hosting an informative workshop on *Sudden Oak Death*; equipping firefighters with *personal protection equipment (PPE)*; and participation in the FLASH rebate program. The CPFSC can be reached by calling (707)-986-7705.

None of the communities within the Southern Humboldt Planning Unit has yet achieved *Firewise* recognition. However, the existence of two local FSCs, as well as the SHFSC's inclusive involvement with a variety of residents, and its extensive efforts to collaborate with other organizations indicate significant dedication to fire safety planning and fire *hazard mitigation* among the communities in this Unit. Considering this, Firewise recognition may not be far off for some of these communities.

IV.13.6. Southern Humboldt Wildfire Protection Capabilities

There are various *special districts* that provide fire protection within this Planning Unit, including a resort improvement district, *a community services district*, and *fire protection districts* (FPD). These districts are financially supported by revenue generated from a variety of sources that can include property taxes, *special taxes* and assessments, donations, and fundraisers. Fire protection services within these districts are provided by VFDs, which supply the communities in this Unit with fire protection, as well as medical and rescue services.

The following entities provide fire protection services to districts within this Planning Unit:[7],[8]

- **Briceland Volunteer Fire Department** has 25 volunteers and serves 650+ residents in a 40 square mile area. This VFD operates out of three stations. Station 1, located in Briceland, has the following apparatuses: a 750 gallon, crew cab, type-1 engine; a 500 gallon, crew cab, type-3 engine; a 200 gallon, type-4 engine, a type T2, 1,200 gallon *water tender*, and a type-3 Basic Life Support (BLS) ambulance. Station 2 is located in Crooked Prairie and contains a 500 gallon type-3 engine, and a type T2, 1500 gallon, 500 gallon-per-minute (gpm)_pump water tender, with a 1,500 gallon portable water tank. And Station 3 has a 4WD SUV Chiefs/command C5400 with medical and rescue equipment. In August 2012, residents in the area voted on the issue of whether or not to transform this VFD into an official fire protection district, which would be funded via a special tax. The Briceland VFD secured a sufficient number of votes and the proposal passed. The Briceland VFD can be reached by calling (707) 923-7204, by email at: bricelandfire@yahoo.com, or by visiting their website at: http://bricelandfire.org/.
- **Garberville Volunteer Fire Department** was established in 1940 and includes approximately 702 acres. This VFD has 12 volunteers and also houses Southern Humboldt Technical Rescue, a separate agency. The Garberville VFD's apparatuses include: a 1,000 gallon, 3 passenger type-2 engine; a 750 gallon, 5 passenger type-2

[7] County of Humboldt, Natural Resources Planning. (2012). *Humboldt County Fire Chiefs Association Annual Report, 2010.* Humboldt County Fire Safe Council. Retrieved from http://www.co.humboldt.ca.us/natural-resources/fire_safe_council/fireserviceannualreport.aspx

[8] Humboldt County Fire Chiefs Association. (2012). 2012 Local Fire Protection Survey.

engine; a 1,000 gallon, 3 passenger type-2 engine; and a utility truck. The Garberville VFD can be reached by calling (707) 923-3196.

- **Miranda Volunteer Fire Department** has 12 volunteers and serves 500 residents in approximately 10 square miles. Their apparatuses include: one type-1 engine, one type-3 engine, and a type-4 quick attack engine. The Miranda VFD can be reached by calling (707) 943-3023.
- **Myers Flat Volunteer Fire Department** has three full-time volunteers. Their apparatuses include: two type-3 engines, one with a Compressed Air Foam System (CAFS). The Fire Chief of the Myers Flat VFD can be reached by calling (707) 223-3175.
- **Redway Volunteer Fire Department** has 11 volunteers. Apparatuses include: a 2000 gallon water tender, two type-1 engines, a quick attack engine, and one utility vehicle. Funding for this VFD is supplemented with annual BBQ fundraiser. The Redway VFD can be reached by calling (707) 923-2617 or (707) 223-1498, by email at redwayfire@gmail.com, or by visiting the Redway Fire Protection District's Facebook page.
- **Shelter Cove Volunteer Fire Department** has 12 volunteers who cover an area of approximately 49 square miles. Their apparatuses include: a 1,000 gallon type-1 engine; a 300 gallon type-3 engine; a 200 gallon type-4 engine; a 750 gallon type-1 pumper; a rescue truck; as well as an RHI boat and a Yamaha jet-ski with a rescue sled. The Shelter Cove VFD can be reached by calling (707) 986-7507, or by visiting their website at: http://sheltercove-ca.gov/fire/fire.htm.
- **Telegraph Ridge Volunteer Fire Department** is located in the Ettersburg area and has 12 members. Their apparatuses include: a 500 gallon type-3 engine, and two type-4 quick attack engines, which hold 300 and 200 gallons. The Telegraph Ridge VFD can be reached by calling (707) 986-7488.
- **Weott Volunteer Fire Department** has 8 volunteers. Their apparatuses include: a type-2 engine and a rescue truck. The Weott VFD can be reached by calling (707) 946-1953 or by email at weottvfd@att.net.
- **Whitethorn Volunteer Fire Department** has 15 volunteers. Their apparatuses include: a type-1 engine, a type-2 engine, and two type-4 quick attack engines. The Whitethorn VFD can be reached by calling (707) 986-7728.

Several *volunteer fire companies* (VFC) also exist within the Unit that have no tax-based support and rely largely on donations and various fundraising efforts from within their communities. These entities provide fire protection, as well as medical and rescue services. They include: [9], [10]

- **Alderpoint Volunteer Fire Company** was organized November 2007 and has 12 volunteers. Their apparatuses include: a Type-3, 500 gallon fire engine, a Type-2, 750 gallon fire engine, a medical rescue vehicle, and a Chief's truck. The Alderpoint VFC can be reached by calling (707) 923-1665.
- **Fruitland Ridge Volunteer Fire Company** is located three miles east of Highway 254, in between Myers Flat and Miranda. This company has 8 volunteers and serves 338 residents in approximately 38 square miles. Their apparatuses include: a 2,250 gallon, freightliner water tender and a 900 gallon international fire engine. In August 2012, residents in the area voted on the issue of whether or not to transform this VFC

[9] County of Humboldt, Natural Resources Planning. (2012). *Humboldt County Fire Chiefs Association Annual Report, 2010 and 2011*.

[10] Humboldt County Fire Chiefs Association. (2012). 2012 Local Fire Protection Survey.

into an official fire protection district, which would be funded via a special tax. However, the Fruitland Ridge VFC was not able to secure enough votes and the proposal did not pass and is now in jeopardy. The Fruitland Ridge VFC can be reached by calling (707) 943-3402.

- **Palo Verde Volunteer Fire Company** was established in 1983 and has 8 active volunteer firefighters. Their apparatuses include: one type-3 wildland fire engine and a type-4 quick attack/brush truck. The Palo Verde VFC also receives department support from federal assistance through USFS (surplus fire engines) and the BLM (funding for fire shelters, webbing gear and fire hose). In August 2012, residents in the area voted on the issue of whether or not to transform this VFC into an official fire protection district, which would be funded via a special tax. The Palo Verde VFC was not able to secure enough votes and the proposal did not pass. The department is now reevaluating its service and reorganizing its support structure. The Palo Verde VFC can be reached by calling (707) 223-0571.
- **Phillipsville Volunteer Fire Company** has 3 volunteer firefighters along with 10 auxiliary members. Their apparatuses include: a type-2 engine that holds 2000 gallons, a type-1 engine, and a type-4 engine. The Phillipsville VFC can be reached by calling (707) 943-3555.
- **Salmon Creek Volunteer Fire Company** services a remote community of about 300 homes, located six miles west of Highway 101. This VFC is made up of 8 volunteers, with 4 auxiliary volunteers, and their apparatuses include: a 1,800 gallon, type-3 water tender, one type-3 fire engine and one type-4 quick attack engine. The Salmon Creek VFC can be reached by calling (707) 943-3006.
- **Sprowel Creek Fire Company** provides fire protection to the Neilson Ranch subdivision in Garberville, with a response area of approximately four square miles. This VFC has upwards of 20 volunteers and their apparatuses include: a 1,000 gallon water tender, and four fire engine pumpers, with capacities of 350 gallons, 700 gallons, and two with 300 gallons. The Sprowel Creek VFC can be reached by calling (707) 223-3399.
- **Whale Gulch Volunteer Fire Company** was started in the 1970s and now has 16 volunteers. Their apparatuses include two type-3 engines, each with a 500 gallon capacity, and one type-4 medical vehicle with 250 gallons. The Fire Chief of the Whale Gulch VFC can be reached by calling (707) 986-7341.

CAL FIRE also has several stations located throughout the Planning Unit. Staffing levels at the CAL FIRE stations in Weott and Garberville vary throughout the year, but remain adequate for emergency response during most of the year. Other stations, located in Alderpoint and Whitethorn (Thorn) are staffed only seasonally, during the declared *fire season*. CAL FIRE also operates two Conservation Camps in the Unit: High Rock Camp, located in Weott, and Eel River Camp, located in Redway. Each camp provides five hand crews for firefighting purposes, and each crew is made up of up to 17 firefighters and a captain. These crews are an all-risk department resource used both within Humboldt County and on a statewide basis year-round. These camp assets are maintained fire/emergency ready year-round. During non-emergency response, these crews are deployed to work on fuel reduction projects and projects requested by other public agencies throughout the year. These crews are trained in emergency responses including, but not limited to, fire, flood, earthquake, medical, and vehicle accidents.

Many of the local fire protection service groups in this Planning Unit have a need for more volunteers and face issues with inadequate facilities and equipment. Emergency response from these groups can be hindered by residential areas within the Unit that have poor signage and contain roads and driveways with insufficient clearance for firefighting apparatuses.

The Southern Humboldt Fire Chiefs Association (SHFCA) is a venue for fire departments and community organizations in the Unit to collaborate for preparedness. The SHFCA is a chapter of the Humboldt County Fire Chiefs Association, a 501(c)3, and comprises firefighters from all the Unit departments and companies as well as Redcrest and Honeydew.

The initial purpose of the SHFCA was to provide a stronger voice for fire departments to bring more training opportunities to the Unit, increase communication between local departments and with CAL FIRE, and to create a stronger fire department identification and numbering system. Successful implementation of those goals over the last 15 years has grown the SHFCA to include representatives from the SHFSC, the HCFSC, the Red Cross, the Southern Humboldt Emergency Preparedness Team (SHEPT), the County Radio Dispatch Co-op, CAL-EMA, Humboldt County OES, and other emergency preparedness groups.

The SHFCA sponsors the Southern Humboldt Technical Rescue Team. The Team is comprised of firefighters from departments within the Unit who specialize in rope, water, and wilderness rescue. Team members are highly dedicated firefighters who train and respond to rescues in addition to the normal training and duties of their respective fire departments. The Southern Humboldt Technical Rescue can be reached by calling (707) 834-1432.

The SHFCA recognizes the community living in the Unit needs to be informed about the issues surrounding wildfires, emergencies, and disaster management. One of the tools used to inform the public is the "Burning Issues" fire and rescue radio talk show on KMUD FM radio. This show provides the SHFCA an opportunity to voice information to the public about training, prevention, standards, legislation, grant writing, and new initiatives and innovations.

In times of emergency, current information needs to be communicated to the public in affected areas of the Unit. FM radios are recognized by the public as a means of getting current emergency information. The KMUD FM radio Community Emergency Response Team receives information from sources such as the SHFCA Public Information Team, CAL FIRE, the California Highway Patrol, and the Humboldt County Office of Emergency Services, and relays that information using live on-air broadcasts and internet updates.

IV.13.7. Southern Humboldt Evacuation

Evacuation from the Southern Humboldt Planning Unit will either travel north or south along Highway 101, southwest on Briceland Thorne Rd., or northeast on Alderpoint Rd., depending on the location of the community at risk and law enforcement recommendations based on *fire behavior*, wind patterns, traffic, and ingress of emergency vehicles. Communities in the western portion of the Unit rely strongly on Briceland Thorne Rd. and the smaller roads connecting to it for ingress and egress; few alternative routes exist for these communities, with the exception of Wilder Ridge Rd., which leads northwest towards Honeydew. The same is true for communities in the eastern portion of the Unit that depend on the accessibility of Alderpoint Rd. and Dyerville Loop Rd. for reaching residences and evacuating during emergencies. However, these roads could provide access away from the Unit if necessary; Briceland Thorne Rd. leads southward into the King's Range Wilderness and Alderpoint Rd. continues northward toward the community of Blocksburg. The critical necessity of these routes for many of the communities within this Planning Unit highlights the importance of maintaining these roads and suggests that residents and law enforcement groups should be thinking creatively about alternative paths that may be taken if these primary routes became inaccessible during an emergency.

Shelter Cove is perhaps the most isolated community in the Unit, however, they could potentially evacuate to the north along Kings Peak Rd., east along Briceland Thorne Rd., or south on Chemise Mountain Rd., which eventually rejoins Briceland Thorne Rd. Given their proximity to the coast, residents in this area could evacuate to the beach, if necessary.

Evacuation impediments may include: dense, steep road sections, landslides, fallen trees, overgrown vegetation preventing emergency vehicle access, poorly marked streets and

intersections, and *one-way-in, one-way-out roads* that could inhibit evacuation and emergency response vehicles, or leave residents stranded should the roads become blocked.

During wildfire events that have the potential to threaten personal safety, community evacuation sites may be established where residents can go to survive a wildfire. Evacuation sites will be established in different locations depending on the anticipated path of the wildfire. The determination for the location of these sites is normally made by Humboldt County Emergency Operations Center Incident Commander in cooperation with an *Incident Management Team*. The Humboldt County Sheriffs and Emergency Officials will use mass communication and door-to-door methods to inform residents about the threat and where residents should go to take shelter.

If a catastrophic event occurs, residents may not be able to reach designated evacuation sites. In such cases, residents may need to make decisions on their own about seeking shelter where they can survive the passage of the wildfire until they can reach an evacuation site. It can be very difficult to determine the right thing to do as the fire approaches. Before a wildfire threatens, community members should talk to their local fire department about evacuation procedures in their neighborhood.

See section V.2.3 in Part V. Fire-Safe Communities for more information on preparing for safe evacuation and evacuation planning for pets and livestock. Also see section II.3.5 Evacuation Routes and Vulnerability in Part II. Risk Assessment for information about evacuation procedures and challenges in Humboldt County.

IV.13.8. Southern Humboldt Community Identified Potential Projects

The following section includes a summary of potential projects identified through the community processes discussed above. Some of the potential projects are illustrated on the community-identified projects map found at the end of this Unit Action Plan (Figure IV.13-3). This map includes projects carried over from the 2006 County fire-planning process, those identified and refined during the local CWPP development process, as well as the 2012 County CWPP update process. In addition, Figure IV.13-2 illustrates community-identified Values and Assets, Hazards and Risks, and Wildfire Protection Resources. The maps in Figure IV.13-2 and Figure IV.13-3 can each be used as a key to access detailed descriptions of community-identified fire planning features on the Humboldt County Web GIS Portal, “Fire Planning” section: http://gis.co.humboldt.ca.us/.

Because of the tremendous amount of work that has been accomplished within this unit and the continued refinement of priorities that is underway, a project matrix was not included in this Unit Action Plan. All of the community identified project information is cataloged in the Web GIS Portal described above and this CWPP incorporates that information by reference here. This information will continue to be made available as a resource for capturing grant funds and continued project implementation tracking.

The Southern Humboldt FSC CWPP is nearing completion and should receive final approval by mid-2013. This document will be much more area specific and will include descriptions of more than 20 neighborhood planning units.

Project ideas are also listed below that are not visible on the maps, because they are not geographically based. These proposed actions also add to and expand upon the 2006 plan, based on the 2012 process (including the County CWPP update and the local CWPP development process). No *vegetation treatments* recommended in this plan will be carried out without the consent and involvement of the property owner and all applicable local, state and federal regulations must be observed.

- Develop a wide range of opportunities for **community education on preparing for wildfire.** This effort should involve the production and distribution of a variety of **informational materials** such as:

- A "Before and After Fuels Reduction" pamphlet, describing and illustrating the process and benefits of reducing hazardous fuels around homes, in neighborhoods, and along access roads.
- A "Constructing a Shaded Fuelbreak" guide that outlines the value and process of creating shaded fuelbreaks.
- A "Living With Fire" publication with information specific to the Southern Humboldt region.
- A compilation of information on proper and safe evacuation planning during a wildfire event.

Community education efforts should also include putting on **workshops** that demonstrate best practices for mitigating fire hazard risks. Potential workshop topics include:

- An educational workshop for landowners on how to create and maintain defensible spaces around homes. This workshop should include information on the importance of defensible spaces for protecting structures, a discussion of fire safe landscaping techniques, and a hands-on demonstration of proper techniques for thinning vegetation and removing brush piles.
- A presentation by CAL FIRE showing wildfire in action, supplemented with photos and video clips. There is potential to conjoin the efforts of this workshop with a fundraiser event for the SHFSC.

- Education efforts should also include **information on ways community members can support and assist local fire departments** by helping with fundraisers, grant writing, becoming a volunteer, etc.
- Conduct projects to **implement more fuelbreaks** throughout the area. Fuelbreaks are needed along access roads in order to assist firefighters and to improve safety during evacuation efforts. Fuelbreaks are should also be implemented within the landscape so as to reduce the risk of rapidly spreading wildfires in the tree canopy.
- **Increase community preparedness for emergency evacuation.** Pinpoint and identify localized evacuation site "Safe Zones" and ensure that residents are made aware of their locations.
- **Improve signage** throughout the communities in this Unit by installing more highly visible road and address signs. This action should also include efforts to reduce confusion within the addressing system, which may contain partial addresses, and minimize ambiguity of road names.
- **Increase available water sources and label them** within the communities so that they may be more readily identified and accessed by firefighters. Install more water tanks and fill them during the winter so as to avoid drawing from creeks that provide critical fish habitat during the summer months. Ensure that existing water tanks are equipped with the proper fittings for fire engines. Water source labeling may be undertaken by implementing the Blue Dot Program.
- **Improve clearance for emergency vehicles** and ensure that driveways and access roads have enough width and height for firefighting apparatus to easily pass through and access properties.
- **Amplify outreach efforts** to improve community workshop participation. Strategies may include: developing fire safety education posters to be displayed at community events; reaching out to local businesses for support; and sending announcement flyers home with students from school.

IV.13.9. Southern Humboldt Action Plan

The following items are the initial priorities for community action for the Southern Humboldt Planning Unit as recommended by this Humboldt County CWPP (not listed in order of priority). In an ideal world, everything recommended here would be implemented. However, it must be understood that implementation will be subject to the availability of funds and other resources and the willingness/ability of community members and Plan Partners to take action. This Action Plan can be cited in grant applications to leverage needed implementation funds and used to guide and inspire action.

- Maintain and support the SHFSC and CPFSC to facilitate community wildfire preparedness and mitigation. This Plan encourages more collaboration between these two active local FSCs.
- Ensure that the SHFSC continues to be represented on the Humboldt County FSC.
- Community members should support their local fire department through activities such as volunteering as firefighters or auxiliary members, making donations, supporting fundraisers, writing grants, and/or helping with administrative tasks. With community support, local fire departments can continue to provide a wide variety of vital emergency services.
- The SHFSC and local fire department representatives should work with community members to further refine and integrate the lists of potential projects identified through the various fire planning processes discussed above and collaborate to prioritize and implement them (See the list included in the section above as well as projects illustrated on the Web GIS Portal). Consider starting with these key project categories:
    - Roadside Clearance and Road Maintenance - Coordinate with Humboldt County Public Works, Roads Division to identify priority areas where collaboration between the County and the local FSC will be possible.
    - Road and Address Signs - Many homes and driveways throughout this community lack adequate signs. Actions that might begin to address this issue are the following:
        - Obtain funding to purchase address signs for residents and educate the community about the importance of signage.
        - Obtain funding to purchase and post additional street/road names.
- Identify neighborhoods that would benefit from participation in the Firewise Communities/USA recognition program and assist them with the application process. This will include an annual update of Firewise action plans, which can be used as a short-term CWPP implementation tool. Actively implementing and maintaining the Firewise action plan on an annual basis will take small bites out of the CWPP which has a five to ten year planning horizon. Focus initial efforts on the following communities:
    - Briceland
    - Telegraph Ridge
    - Salmon Creek
    - Shelter Cove
- Share GIS data sets between local representatives and County staff to maintain the projects included in the County Web GIS Portal.

The SHFSC and local fire department representatives should work with the Humboldt County Office of Emergency Services to engage community members in evacuation preparedness. Efforts should be made to ensure that local gates are open or accessible during Red Flag conditions.

Figure IV.13-1 Southern Humboldt Planning Unit

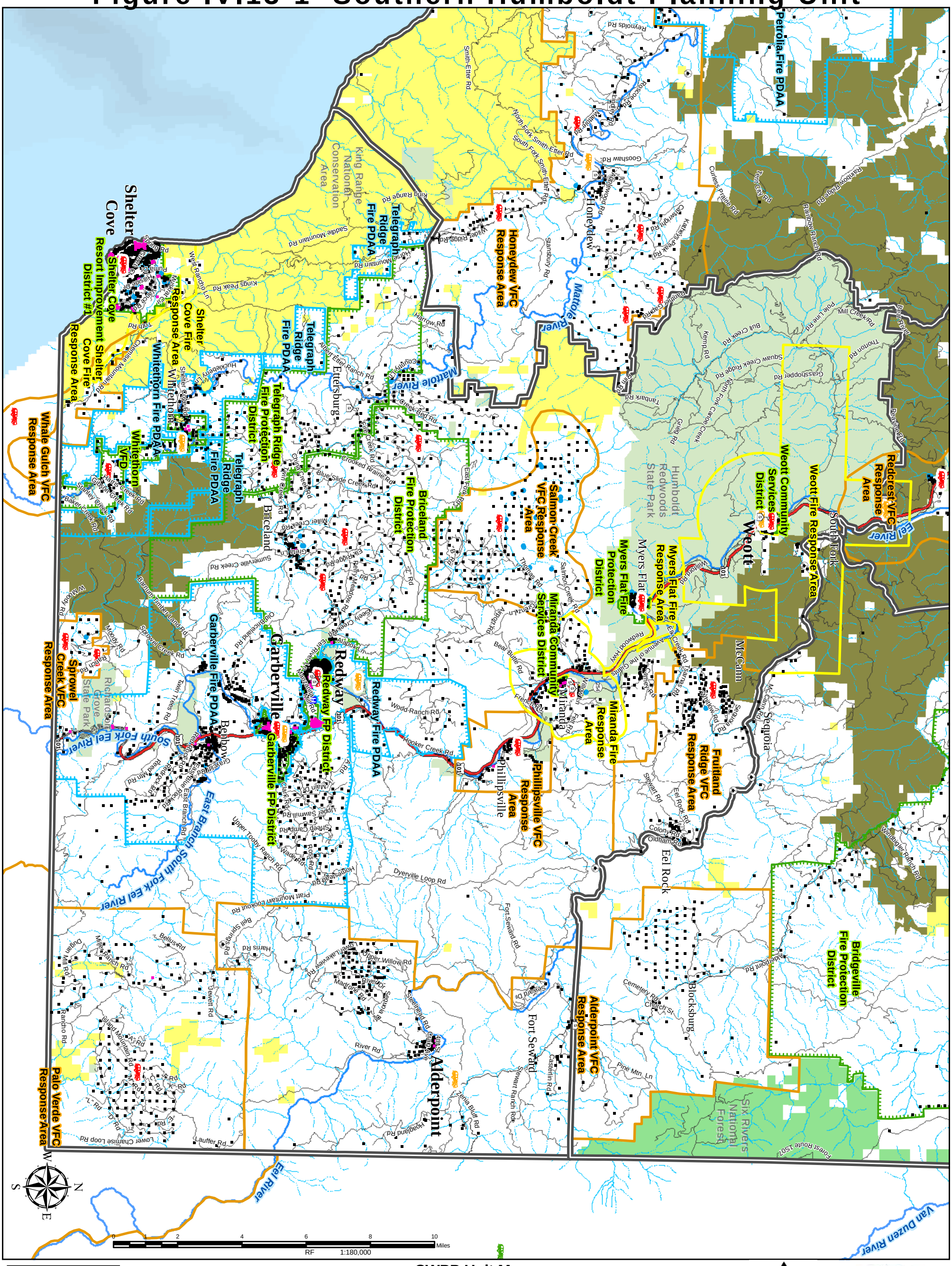
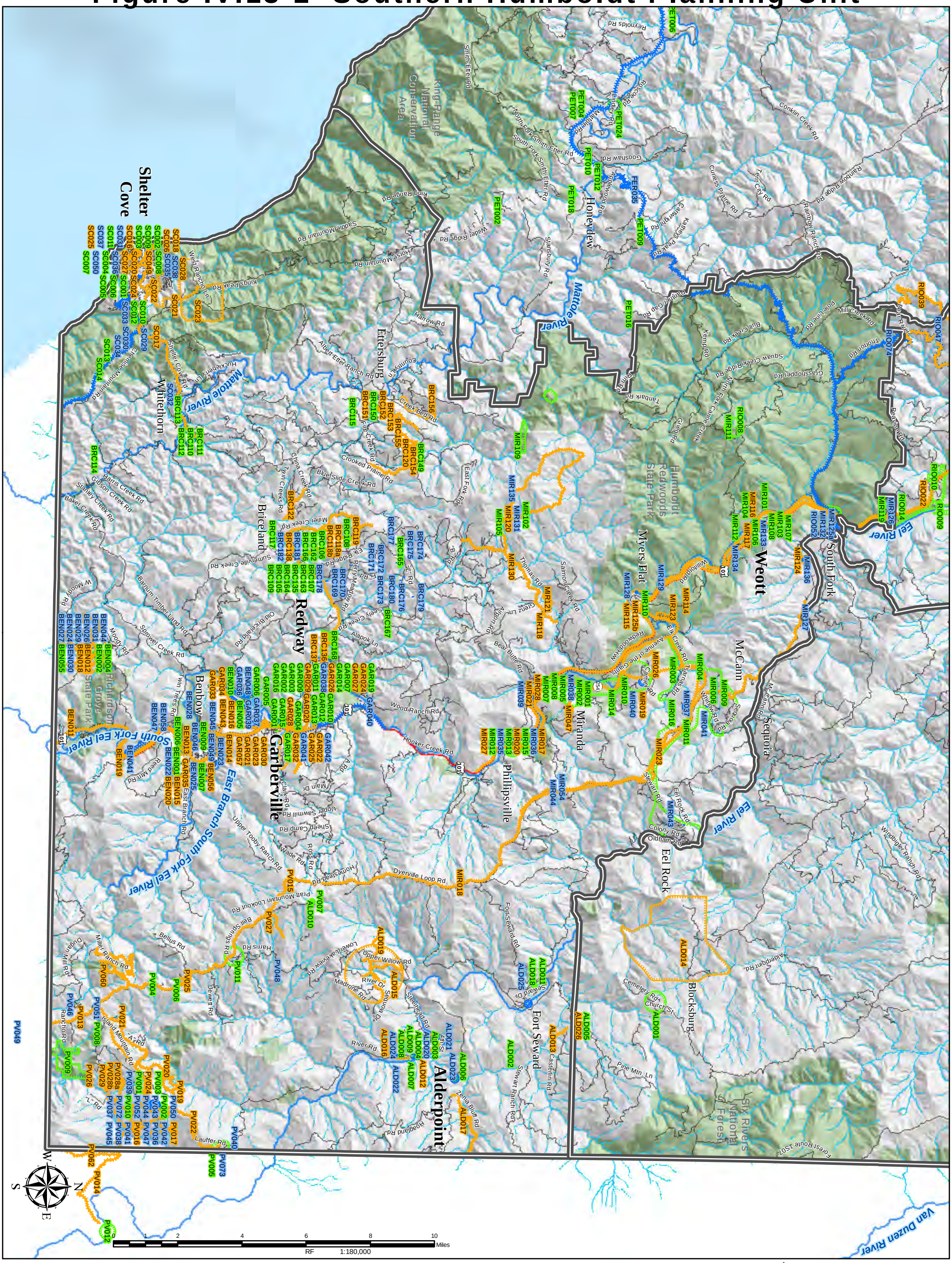
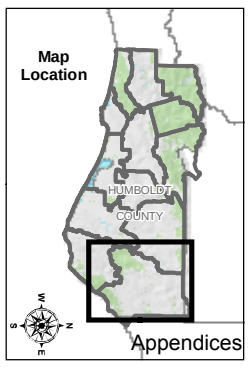

Petrolia Fire PDAA
Honeydew
Honeydew VFC Response Area
Mattole River
Shelter Cove
Shelter Cove Resort Improvement District #1
Cove Fire Response Area
Whale Gulch VFC Response Area
Whitethorn Fire PDAA
Whitethorn VFD
Telegraph Ridge Fire Protection District
Telegraph Ridge Fire PDAA
King Range National Conservation Area
Briceland
Briceland Fire Protection District
Salmon Creek VFC Response Area
Humboldt Redwoods State Park
Weott
Weott Community Services District
Weott Fire Response Area
Redcrest VFC Response Area
Myers Flat
Myers Flat Fire Protection District
Myers Flat Fire Response Area
Miranda
Miranda Community Services District
Miranda Fire Response Area
McCann
Fruitland Ridge VFC Response Area
Sequoia
Garberville
Garberville Fire PDAA
Garberville FP District
Redway
Redway FP District
Redway Fire PDAA
Sprowel Creek VFC Response Area
Richardson Grove State Park
Benbow
South Fork Eel River
East Branch South Fork Eel River
Phillipsville
Phillipsville VFC Response Area
Fort Seward
Alderpoint
Alderpoint VFC Response Area
Blocksburg
Bridgeville Fire Protection District
Six Rivers National Forest
Palo Verde VFC Response Area
Eel River
Van Duzen River
Eel Rock
Mattole River
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South Fork Smith-Etter Rd
Goostaw Rd
Curless Prairie Rd
Ten Mile Rd
Rainbow Ridge Rd
Rainbow Ranch Rd
Kaneis Peak Rd
Stansbury Rd
Maple Creek Rd
Saddle Mountain Rd
King Range Rd
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Horse Mountain Rd
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Mistletoe Ln
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Pumalo Ln
Chalfant Ridge Rd
Tooth Rd
Chalfant Ridge Rd
Whitethorn Rd
Huckleberry Ln
Shelter Cover Rd
Harrow Rd
Albert Etter Ranch Rd
County Ln
Creek Bed Rd
Fire Creek Rd
Crooked Prairie Rd
Blue Slide Creek Rd
Dinsa Creek Rd
Twin Creeks Rd
Miller Creek Rd
Stanley Creek Rd
Baker Creek Rd
Cuddy Creek Rd
Sunnyville Creek Rd
Elk Ridge Rd
Petrolia Rd
Briceland Rd
East Fork Rd
Barnum Timber Land Rd
Oilfield Land Rd
Moody Rd
Sprowel Creek Rd
Ruth Rd
Twin Trees Rd
Wood Ranch Rd
Hooker Creek Rd
Alderpoint Rd
Ettersburg Rd
Ettersburg
Redway
Garberville
Benbow
Phillipsville
Fort Seward
Alderpoint
Blocksburg
Weott
Myers Flat
Miranda
McCann
Sequoia
Honeydew
Petrolia
Whitethorn
Cove
Briceland
Redcrest
Bridgeville
Fruitland
Ridge
Mattole River
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Eel Rock
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Rainbow Ranch Rd
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Maple Creek Rd
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Honeydew
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Whitethorn
Cove
Briceland
Redcrest
Bridgeville
Fruitland
Ridge
Mattole River
Eel River
Van Duzen River
Eel Rock
Reynolds Rd
Roscoe Rd
Matole Rd
Elmwood Rd
Canonchi Rd
Tanoak Rd
Grieg Rd
Pole Line Rd
Bull Creek Rd
Kemp Rd
Squaw Creek Ridge Rd
Grasshopper Rd
North Fork Canoe Creek
Mill Creek Rd
Thorton Rd
Beaver Rd
Reawillie Rd
Tanoak Rd
Grieg Rd
Weott
Redcrest
Myers Flat
Miranda
McCann
Sequoia
Honeydew
Petrolia
Whitethorn
Cove
Briceland
Redcrest
Bridgeville
Fruitland
Ridge
Mattole River
Eel River
Van Duzen River
Eel Rock
Avenue of the Giants
Redwood Hwy
Elm Creek Rd
Canoe Creek Rd
Cemetery Rd
Church St
Alderpoint Rd
Pine Mtn. Ln
Forest Route 1S07
Six Rivers National Forest
Humboldt Redwoods State Park
Myers Flat
Weott
South Fork
Eel River
Salmon Creek Rd
Thompson Rd
Angotti Rd
Bear Butte Rd
French Rd
Fort Seward Rd
Stewart Rd
Eel Rock Rd
Colonyville Rd
Oldham Rd
Windbigler Ranch Rd
Stewart Ranch Rd
Castelfin Rd
Zenia Bluff Rd
Hoaglund Rd
Steelhead Rd
Cedar Flat Rd
Upper Willow Rd
River Dr
Madrone Rd
Sequoia Dr
Upper Lakeview Rd
Harris Rd
Bell Springs Rd
Dyerville Loop Rd
Upper Tooby Ranch Rd
Wade Rd
Ross Rd
Houselead Rd
Pratt Mountain Lookout Rd
Sheep Camp Rd
Upper Samuel Rd
Clark Rd
Main Rd
East Branch Rd
Redcrest Rd
Cahto Ave
Redwood Dr
Redwood Ln
Redwood Ct
Redwood Pl
Redwood Cir
Redwood Way
Redwood Ave
Redwood Rd

Figure IV.13-2 Southern Humboldt Planning Unit





CWPP - Community Identified Protection, Values/Assets, & Risks/Hazards

Legend

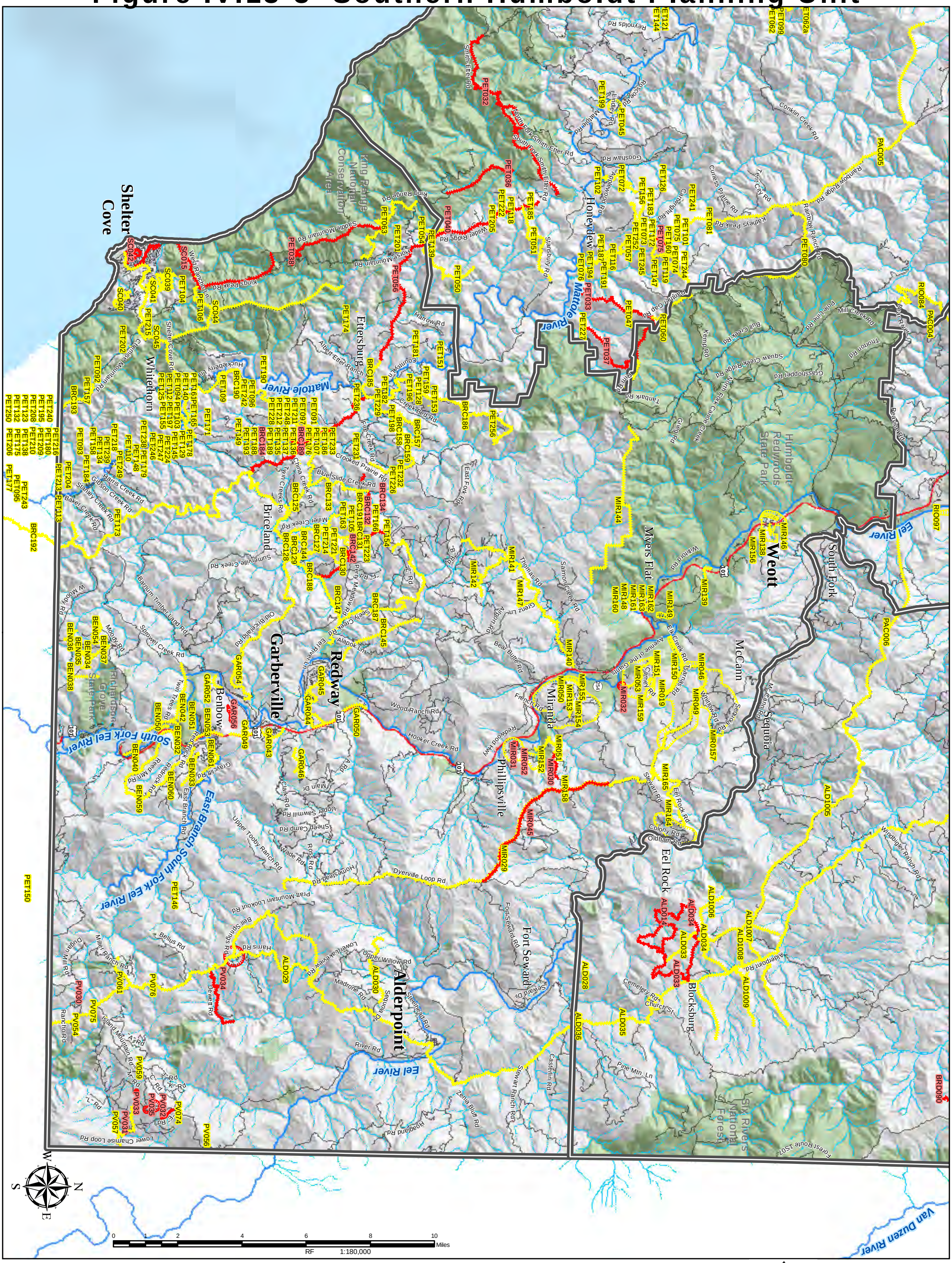
- CWPP Planning Unit Boundary
- **Community Identified Features**
  - Protection/Evacuation
  - Value/Asset
  - Risk/Hazard
- **Land Ownership**
  - Parks/Public Land
  - Cities
- **Highways and Roads**
  - HWY 101
  - State HWY
  - HWY or Secondary Road
  - Local Road or Street
- **Hydrography**
  - Major River or Stream
  - Perennial Stream
  - Intermittent Stream

Land ownership and infrastructure data has been compiled by The County of Humboldt. Fire planning features identified at community workshops by residents; local, state, and federal fire service personnel; and Humboldt County staff. Other data sources were the 2006 Humboldt County Master Fire Protection Plan

This map is intended for planning purposes and should not be used for precise measurement or navigation.

Map compiled by County of Humboldt, March 2013
Online maps visit: http://gis.co.humboldt.ca.us
Contact: cimmit@co.humboldt.ca.us or jvondohlen@co.humboldt.ca.us

Figure IV.13-3 Southern Humboldt Planning Unit


Shelter Cove
Whitethorn
Briceland
Garberville
Redway
Benbow
Richardson Grove State Park
Ettersburg
Honeydew
Miranda
Phillipsville
Alderpoint
Fort Seward
Myers Flat
Weott
South Fork
McCann
Sequoia
Eel Rock
Blocksburg
King Range National Conservation Area
Humboldt Redwoods State Park
Mattole River
Eel River
South Fork Eel River
East Branch South Fork Eel River
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Kings Peak Rd
West Ranch Rd
Saddle Mountain Rd
King Range Rd
Horse Mountain Rd
Wilder Ridge Rd
Stansbury Rd
Harrow Rd
Albert Etter Ranch Rd
Shelter Cove Rd
Huckleberry Ln
Chalfant Mountain Rd
Mattole Rd
Creek Rd
Red Rd
Fiile Creek Rd
Crooked Prairie Rd
Blue Slide Creek Rd
China Creek Rd
Twin Creeks Rd
Miller Creek Rd
Sunnilvie Creek Rd
Perry Meadow Rd
Oceanview Dr
Alapok Ln
Bear Butte Rd
Wood Ranch Rd
Hooker Creek Rd
French Rd
Redwood Hwy
Avenue of the Giants
Elk Creek Rd
Tsarnascy Rd
Carnel Rd
Tanbark Rd
Grieb Rd
Thomas Rd
Salmon Creek Rd
Airport Rd
Glenz Ln
Titlow Rd
Willard Rd
Goosnaw Rd
Applewood Rd
Reynolds Rd
Matole Rd
Lundey Rd
Roscoe Rd
Conklin Creek Rd
Curless Prairie Rd
Tan Ck Rd
Kathys Peak Rd
Rainbow Ridge Rd
Rainbow Ranch Rd
Ranger Cap Rd
Pole Line Rd
Mill Creek Rd
Bull Creek Rd
Kemp Rd
Squaw Creek Ridge Rd
North Fork Cooper Creek
Thorton Rd
Grasshopper Rd
Bear R Rd
Beatmine Rd
Eel River
Stewart Rd
Eel Rock Rd
Colony Rd
Oldham Rd
Windbigler Ranch Rd
Forest Route 1507
Six Rivers National Forest
Pine Mtn Ln
Cemetery Rd
Church St
Aldergrove Rd
Fort Seward Rd
Seward Dr
Upper Willow Rd
Lower Lakeview Rd
Madrone Rd
Sequoia Dr
Steelhead Rd
Castella Rd
Stewart Ranch Rd
Zenia Bluff Rd
River Rd
Hoagland Rd
Honeydew Rd
Dyerville Loop Rd
Upper Tooby Ranch Rd
Wade Rd
Ross Rd
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Upper Sawmill Rd
Clark Rd
Main Dr
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Barnum Timber Land Rd
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Redrock Rd
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Wood Ranch Rd
Hooker Creek Rd
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Redwood Hwy
Tanbark Rd
Grieb Rd
Thomas Rd
Salmon Creek Rd
Airport Rd
Glenz Ln
Titlow Rd

Part V. Fire-Safe Communities

Overview

This document is a guide written for you as Humboldt County residents, to use to fire-safe your homes and properties. The following chapters will show you what preventative actions can help make your home an asset during a wildfire, instead of a liability. You will also learn what steps need to be taken before, during, and after a wildfire to reduce the potential for loss of life and property. The recommendations made in these pages strive to strike a balance between fire safety and ecological health. It is important to consider ecological (and other) concerns to maximize the benefits of your fire-safety efforts and to avoid unintentionally creating one or more problems while fixing another. For this reason, conservation goals and principles are mentioned often when recommendations are being made for how to safely live with wildfire.

Chapter V.I of this document addresses what you can do *From the House Out* to reduce your vulnerability to wildfire losses. Where fuels are abundant (including ignitable homes), a fire can burn very hot and move quickly. When little fuel is present, fires tend to slow down and burn cooler. Since cooler fires are easier to manage, reducing the amount, type, and arrangement of fuel in and around your home is your best defense against wildfire. **The content of this chapter will give you detailed information about how to manage the fuel that can be found in and around your home, the surrounding landscape, and beyond**.

Chapter V.2 provides a detailed discussion of CAL FIRE's ***Ready, Set, Go!*** program with recommendations for how to apply these program principles here in Humboldt County. When wildfire threatens our communities, there is often not much time to ensure the safety of your family and property. Furthermore, firefighters might have their hands full then, and therefore may be limited in their ability to assist you. For these reasons, **this chapter provides valuable information about how to prepare ahead of time and help firefighters be successful in defending your home. You will also find resources to help prepare your family for evacuation and to help you survive, should you become trapped by wildfire.**

Chapter V.3 focuses on what to do ***After the Fire***. The after effects of a wildfire can pose safety threats to people as well as the natural environment. It is important to keep in mind the residual impacts that are possible, following a wildfire event. Impacts range from the dangers of damaged homes and falling snags, to ashy soil running into sensitive waterways, to invasive plant species taking hold where native plants have been destroyed. **This chapter contains advice for assessing the damage, developing a restoration plan, and prioritizing where you should start in your post-fire mitigation activities. There are also helpful tips on how to be better prepared the next time wildfire threatens.**

Chapter V.4 lists the ***Legal Requirements*** that all residents need to be aware of as we build our homes and work on our fire-safety tasks. There are local and state regulations required of us that are intended to protect against the negative impacts of wildfire, and to help firefighters succeed in their protection efforts. Additionally, most wildfire-mitigation activities—if they are *"ground disturbing"*— require compliance with environmental regulations in order to reduce impacts on the natural surroundings and biotic communities. **This chapter will help you better understand which regulations you need to be aware of as you move forward with your efforts to enhance your fire safety and preparedness.**

Humboldt County Community Wildfire Protection Plan

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V.1. From the House Out[1]

Research and experience shows us that what you do to your house itself and the area directly adjacent to it will have the biggest impact on your home's ability to withstand a *wildfire*. Therefore, **this *Community Wildfire Protection Plan* (CWPP) promotes a strategy of preparation "from the house out."**

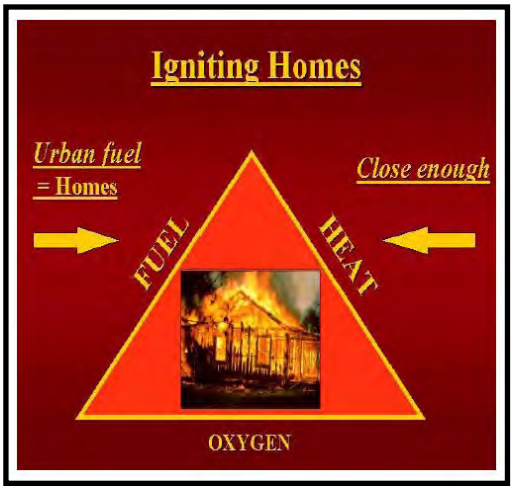


Figure V.1-1. Fuel Triangle
"In the context of wildland-urban fires, the homes are the fuel. The heat comes from burning materials adjacent to the home (e.g. vegetation, wood piles, and buildings) and firebrands (lofted burning embers) on the home. How close flames are to the home and whether or not firebrands contact the home determines how much heat the home receives." *Source: Jack Cohen (2000), "Wildland-Urban Fire, A Different Approach."*

Three factors are required for fire: *fuel*, oxygen, and heat; together they comprise what we call the fire triangle. If any one of these elements is missing, a fire won't start; or should it start, it won't spread. Fuel is the one element of the fire triangle that we can modify. For this reason, the general principle behind making an area "*fire-safe*" (making it as safe as possible for when a fire does pass through) is to reduce the amount of fuel that a fire could consume and to alter its arrangement and type. In other words, you do not want anything near your home that could ignite, burn, or spread fire. The fuels closest to a home—including the home itself—are often what make the difference between surviving a wildfire or not. Wildfire ignites homes through transferring heat in three ways:[2]

Three Ways Your Home Can Be Exposed to Fire[1]

Embers

These are glowing or burning pieces of vegetation or construction debris that are lofted during the wildfire. *Embers*, also known as *firebrands*, can move up to a mile ahead of a firestorm. These small embers or sparks may fall on the vegetation near your home; on dry leaves, needles, or twigs on your roof; on the roof and then subsequently concentrate within five feet of the house; or under your deck with subsequent *ignition* of vegetation or debris that could then ignite and burn down your house. If ignited from embers that come from outlying areas, a continuous sequence of vegetation can carry flames from your landscaping to your house. The concentration of embers that land on the roof and roll off of it makes the removal of all flammable material within five feet of the house critical.

Radiant Heat

This is the heat given off by burning materials that is transferred through the air to other materials or objects. *Radiant heat* from a fire near your house can heat the surface of *combustible* building materials to a point where *combustion* occurs. Radiation may also fracture large plate glass windows

Flame Impingement

This refers to the transfer of heat by direct flame exposure. Direct contact with fire flames will heat the combustible building materials of your home. Depending on the *exposure* (i.e., time and intensity) of the flame, materials can ignite or break. For example, in a high-intensity fire, your siding material could ignite or the glass in your windows could break.

[1] This document is based on the ongoing work of: Katelman, T. & ForEverGreen Forestry. (2012). Retrieved from www.forevergreenforestry.com.

[2] Nader, G., Nakamura, G., De Lasaux, M., Quarles, S. & Valachovic, Y. (2007). *Home Landscaping for Fire*. Regents of the University of California Division of Agriculture and Natural Resources (UCANR), Publication 8228. (p.3.) Retrieved from http://anrcatalog.ucdavis.edu. © 2007 Regents of the University of California. Used by permission.

Research shows that the cause for most homes igniting is usually not the fire front nor the wall of flames, but the presence of wind-carried embers or firebrands in combination with sufficient fuel to be ignited.

> "Understanding how homes ignite during wildland-urban fires provides the basis for appropriately assessing the potential for home ignition and thereby effectively mitigating wildland-urban fire ignitions. Fires do not spread by flowing over the landscape, and high-intensity fires do not engulf objects, as do avalanches and tsunamis. All fires spread by meeting the requirements for combustion—that is, a sufficiency of fuel, heat, and oxygen. In the context of severe wildland-urban fires, oxygen is not a limiting factor so this type of fire spreads according to a sufficiency of fuel and heat. Homes are the fuel and the heat comes from the flames and/or firebrands of the surrounding fires…. Recent research … indicates that the potential for home ignitions during wildfires including those of high intensity principally depends on a home's *fuel characteristics* and the heat sources within 100-200 feet adjacent to a home (Cohen, 1995; Cohen 2000; Cohen and Butler, 1998). This relatively limited area that determines home ignition potential can be called the **home ignition zone**."[3]

V.1.1 The Home Ignition Zone

The home and its immediate surroundings within 100-200 feet is referred to as the *Home Ignition Zone*; a concept introduced by Dr. Jack Cohen[4] of the United States Forest Service (USFS) Rocky Mountain Research Station, a recognized leader in the science of how homes burn. The home's resistance to ignition and, ultimately, its likelihood of survival during a wildfire event, is largely due to the condition of this zone. Dr. Cohen's research of fires from the 1960s to the present reveals that more than 80% of homes with at least 30 feet of *defensible space* and a *fire-resistant* roof have survived wildfires.[5] Dr. Cohen states:

> "The results … generally concur and indicate that the large flames of high-intensity fires do not ignite a home's wood exterior at distances greater than 100 feet. This is consistent with our understanding that local wildland fuel reduction can result in significant local fire intensity reduction. The research suggests that if the big flames are not igniting the destroyed homes then relatively low-intensity fires contacting or in near contact with a home's flammable materials and/or direct firebrand ignitions must be the ignition sources. Thus, a home's characteristics, its exterior materials and design, in relation to the immediate area around a home within 100 feet principally determine the home ignition potential. I call the home and its immediate surroundings the home ignition zone."[6]

Dr. Cohen again, from a separate document:

> "Because of time constraints, most preparation has to come before a wildfire occurs. Major changes to the home ignition zone (the home and its immediate surroundings) such as replacing a flammable roof and removal of vegetation … cannot occur during the approach of a wildfire. Removal of firewood piles, dead leaves, conifer needles, dead grass, etc., from on and next to the home should also occur seasonally before severe fire conditions. The ignition potential of the home ignition zone largely influences the effectiveness of protection during a wildfire. Given low

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[3]Cohen, J.D. (2000). Wildland-urban fire – a different approach. Fire Sciences Laboratory. Missoula, MT: USDA, Forest Service, Rocky Mountain Research Station. Retrieved from http://www.firewise.org/~/media/Firewise/Files/Pdfs/Research/CohenWildlandUrbanFireApproach.pdf

[4] National Fire Protection Association, Firewise Communities (Firewise Communities). (2012). The Jack Cohen files. Retrieved from http://www.firewise.org/information/research-and-guidance/wui-home-ignition-research/the-jack-cohen-files.aspx

[5] Firewise Communities. (2008). Wildfire: Preventing home ignitions [video]. Retrieved from http://www.firewise.org/information/video/for-the-general-public.aspx

[6] Cohen, J.D. (2003, June). Thoughts on the wildland-urban interface fire problem. *International Journal of Wildland Fire Science.* Retrieved from www.firewise.org/resources/files/WUI_HIR/ThoughtsOnWUI.pdf.

> ignition potential and enough time, homeowners and/or wildland-urban suppression resources can make significant reductions in the little things that influence ignition potential before wildfire encroachment. Then, if possible, homeowners and/or wildland-urban firefighting resources can suppress small fires that threaten the structure during and after the wildfire approach."[7]

Consequently, it's the work done in the Home Ignition Zone to reduce *flammability* (i.e. the degree to which substances are likely to catch fire) that can make the difference between a wildfire disaster and successfully coexisting with wildfire.

> "If homes are sufficiently resistant to ignition and do not ignite during the extreme wildfire exposure, then the homes survive without firefighter protection: we have an extreme wildfire but not a WUI[8] fire disaster. Thus, WUI fire disasters principally depend on home ignition potential."[9]

The concepts put forth by Dr. Cohen about the Home Ignition Zone are crucial for designing actions in and around your home to survive wildfire. Studies done after many large fires consistently conclude that homes built with *ignition-resistant* materials have a much higher fire survival rate than those that aren't. Combining fire hardened building features with 100 feet of defensible space will dramatically improve the likelihood that your home will still be standing after a wildfire passes by—even if firefighters are unable to stay and actively protect it.

> "Building loss and survival in the 1961 Bel Air fire, which destroyed 505 houses, was well documented. The report 'Decision Analysis of Fire Protection Strategy for the Santa Monica Mountains' found that 71% of the buildings with 26–50 feet of brush clearance survived the fire. However, the survival rate of buildings exposed to the fire increased to 95% for houses that had both brush clearance and ignition-resistant building construction (in this case non-wood roof covering). A similar pattern was seen on the 1990 Santa Barbara Paint fire…"[10]

Inspired by the findings of the research discussed above, the following sections focus on how you can harden your home to the impacts of wildfire and how to create the most effective defensible space.

Hardened Homes

"Fire hardened" means that your home is more secure from wildfire threats. **It does NOT mean fireproof, but rather that you have protected the weakest parts of your home's vulnerabilities with proven building materials and/or techniques to resist some heat and flame along with the ember storm that accompanies large wildfires.** A common misconception is that buildings burn randomly during wildfire events—this is not the case. It is the most vulnerable homes, those built or retrofitted without consideration for fire-safe construction, that have the greatest likelihood of burning.

Part of learning to live with wildfire is cultivating an understanding that we have much control regarding how we address this vulnerability, and how we can prepare and manage for fire in our individual communities. *Hardened-home* features are mandatory for new construction, yet these suggested standards are also useful when remodeling or making improvements to your home to enhance its fire safety. Three priority considerations and target areas for hardening your home to wildfire are: the roof, the vents, and materials immediately surrounding the home.

Building Standards

The County of Humboldt adopts and enforces the most current state building regulations. As of 2011, the *wildland-urban interface* (WUI) standards relevant to fire-safe construction for all new structures in the *State Responsibility Area* (SRA) are the California Building Code, Chapter 7A (applied to commercial construction) and

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[7] Cohen, J.D. (2000). Wildland-Urban Fire—A Different Approach.

[8] WUI = Wildland-Urban Interface

[9] Cohen, J.D. (2008). The wildland-urban interface problem–A consequence of the fire exclusion paradigm. *Forest History Today, Fall 2008: 22–23*. Retrieved from www.foresthistory.org/Publications/FHT/FHTFall2008/Cohen.pdf.

[10] Slaughter, Rodney (Ed.). (1996). *California's I-Zone: urban/wildland fire prevention & mitigation.* (p. 120.) Sacramento, CA: Governor's Office of Emergency Services.

the California Residential Code, Chapter 3, Section R327 (applied to residential construction).[11] These building standards are required by state law and are part of the California Building Standards to which all jurisdictions must adhere. The recommendations forming the basis of California's WUI Building Standards became law in 2003. Related work on the standards was completed and adopted by the California Building Standards Commission in 2007. *For the latest information on these Standards, see: www.fire.ca.gov/fire_prevention/fire_prevention_wildland_codes.php and the 2009 supplement: www.fire.ca.gov/fire_prevention/downloads/ICC_2009_Ch7A_2007_rev_1Jan09_Supplement.pdf.*

These standards are updated every three years and may change from time to time to keep pace with the latest products, research, and testing.[12] The WUI standards are designed to be used in conjunction with adequate defensible space; without both—defensible space and fire-safe construction or retrofit—your home is not hardened. Both require maintenance throughout the life of your home.

In addition, Section R313 of the California Residential Code requires all new dwellings, dwelling units, and one and two family townhomes to be equipped with an automatic fire sprinkler system. [13] This system must comply with National Fire Protection Association standard 13D, as modified by the California State Fire Marshall.

To keep this CWPP current, code updates can be added to this section of future versions. The following information is current as of 2012. For more information on building standards, please see:

- **Humboldt County Building Division, Building Codes**
  http://www.co.humboldt.ca.us/planning/building/#codes
- **California Wildland-Urban Interface Code, including Chapter 7A**
  http://www.fire.ca.gov/fire_prevention/fire_prevention_wildland_codes.php
- **California WUI Building Standards, 2009 Supplement**
  http://www.fire.ca.gov/fire_prevention/downloads/ICC_2009_Ch7A_2007_rev_1Jan09_Supplement.pdf
- **2010 California Fire Code, Title 24, Part 9, based on 2009 International Fire Code with California Amendments**
  http://publicecodes.citation.com/st/ca/st/b300v10/index.htm
  (The County of Humboldt has not adopted this code. However, several fire districts within the county have adopted the code and it is enforced within the jurisdictional boundaries of those agencies.)
- **Humboldt County Fire Safe Regulations**
  http://co.humboldt.ca.us/planning/planning_library/fire_regs/firesafe.pdf or Appendix F
- **Humboldt County Fire Safe Regulation Checklist (Building Permit)**
  http://co.humboldt.ca.us/planning/building/documents/sra_regulation_chklst.pdf or Appendix H.

Building Features and Ignition-Resistant Construction

The concept behind ignition-resistant is not that you are creating a fireproof bunker, but that you are hardening your home against the most likely threat—embers. This means that you can still build with many of the same materials you have used in the past. Now, however, you (or your contractor) will need to pay attention to small details like gaps between boards, vents with air holes where embers can enter, and places where embers can pile up and become glowing beds of coals. This is a detail issue as much as it is a big-picture issue.

Remember, you must also maintain your defensible space. Building design and construction, and *vegetation management* are equally vital variables in the defensible space equation. **Focus your fire-safe building and retrofits on these top three features: roofs, vents, and the materials immediately surrounding the home.**

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[11] The most up-to-date versions of these codes can be viewed online at: County of Humboldt, Planning and Building Department. (n.d.). *Building Codes.* Building Inspection Division. Available at: www.co.humboldt.ca.us/planning/building/#codes.

[12] California Health and Safety Code, section 13108.5, (2011).

[13]The full text on Automatic Fire Sprinkler Systems can be viewed online at: County of Humboldt, Planning and Building Department (n.d.). *Sprinkler Systems.* Building Inspection Division. Available at: www.co.humboldt.ca.us/planning/building/#forms.

Finally, be sure all fire-safe building products you use carry the State Fire Marshal's approval. Unfortunately, there are people trying to take advantage of your fears of wildfire to sell inferior products that claim to meet these standards but do not. These products may not protect your home from wildfire.

The "Building Materials Listing Program" (available through the CAL FIRE website) provides an online listing service to help users identify which products have been approved by the State Fire Marshal to harden homes. [14]. This tool is located at: http://osfm.fire.ca.gov/licensinglistings/licenselisting_bml_searchcotest.php.

The following recommendations for particularly vulnerable features of your home are intended to provide some initial guidance and are based on current WUI building standards.

Roofs

The roof is the most vulnerable part of any home to wildfire since embers can land, lodge, and start fires in the nooks and crannies of roofs. Places where there are horizontal-to-vertical intersections on roofs, along dormers, for example, are particularly vulnerable spots, as ignitable debris can collect within these crevasses. Once a roof covering ignites, chances are that the rest of the home will follow.[15] If you have a shake roof, your house is more likely to burn down and ignite your neighbors' homes. One of your first actions should be to replace a shake or wood-shingle roof. Humboldt County prohibits all wood roofs in Very High *Fire Hazard Severity Zones*.

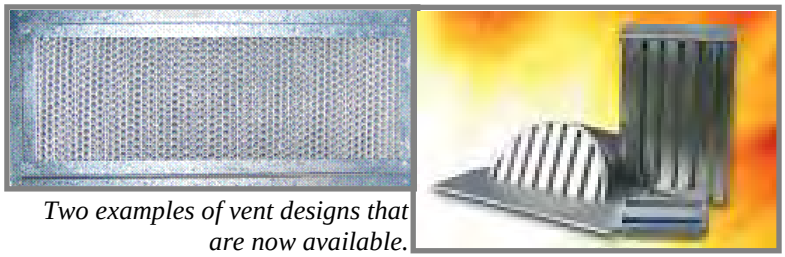
Fire ratings for roofs describe their fire-resistance protection level, where Class A provides the highest level of protection and Class C provides the lowest level. All new roofs need to be Class A, which means they must meet certain requirements pertaining to fire-penetration resistance, surface-flame spread, and ember-generation potential. Some roof coverings obtain a stand-alone Class A rating, while others require an additional underlying material to enhance fire protection. Class A roofs are constructed of non-combustible coverings like tile, metal, or concrete with proper underlayment and sealing below. Roof tiles must always be completely sealed at their edges. Regularly clearing your roof of debris is an important fire-safe practice, no matter what the fire rating is.

Eaves

Embers can gather under open *eaves* and *soffits* and ignite exposed wood or other combustible material. Eaves should be "boxed" or enclosed.[16] If eaves cannot be enclosed, then residents should be extra vigilant about keeping all flammable materials at least 10 feet away from the home. Absolutely minimize any heat or flame that can work its way up a wall and get trapped under the eaves.

Vents

Vents are important housing features that allow air flow and let out moisture; however, vents are also points of vulnerability for home ignitions. Embers that enter through vents can reach attics or other concealed spaces and ignite combustible materials. Unscreened vents



Two examples of vent designs that are now available.



Vents are vulnerable openings that must be protected in order to harden your home. This is a great retrofit opportunity. Source: Cal Chiefs Fire Prevention Officers WUI Workshop, Cliff Hunter/Rolland

[14] CAL FIRE, Office of the State Fire Marshal. (2007). *Building Materials Listing Program.* Retrieved from http://osfm.fire.ca.gov/strucfireengineer/strucfireengineer_bml.php

[15] Firewise Communities. (2012). *Communities Compatible with Nature* [brochure]. Retrieved from www.firewise.org/information/brochures-and-booklets.aspx.

[16] Firewise (2012). *Communities Compatible with Nature.*

are extremely hazardous and should be retrofitted immediately. The Building Code requires that vents be covered with a noncombustible wire-mesh screen. Keeping the areas underneath vents free of combustible vegetation and debris can help prevent ember-entry as well. There are several products coming onto the market that address this need and are very good candidates for your home. They combine a back-up system (such as baffles or honeycombs) in addition to the required screening. *See the Building Materials Listing Service mentioned above.*

Walls and Siding

Walls need to resist heat and flames as well as embers. Non-combustible material like stucco, concrete, and tile obviously resist flames but may not always resist heat and embers. Sidings made out of wood can be made less combustible when treated with an exterior *fire-retardant* chemical. Ensure that there is a sheet-rock barrier underneath the finishing material and that any gaps along the bottom or top edges have been sealed or caulked. Sealing cracks and gaps within walls and siding is important as these are vulnerability points for flame entry. Underlying sheathing can significantly improve fire resistance in sidings as well. Seriously consider replacing your charming wood-shingle siding with look-alike concrete products that will help save your home when wildfire rages.

Windows and Doors

Windows are vulnerable to heat because they will break. Many homes are lost when radiant heat or flames from burning vegetation shatter the window glass. Embers then fly into the home through the broken window and ignite the home from within—even when no other ignition has occurred. All windows should be double paned and have an outside panel of tempered glass. The tempering allows just enough extra heat resistivity to protect against moderate heat exposure. (Remember, you still have that defensible space outside the window.) Embers can enter gaps in doors, including garage doors, so have solid-closing doors made of non-combustible material or heavy, solid wood. If you have a pet door, be sure to have a way to completely close it to keep it from opening during a wildfire and allowing embers a pathway into your home.

Balconies and Decks

Embers can collect in or on surfaces or undersides of decks and balconies, ignite the material, and then enter the home through walls or windows. In addition, many people store materials underneath decks and balconies that create a ready nest of flammable stuff for embers to ignite. These are also locations where debris and dead vegetation can accumulate easily. Often, it is the stored materials and debris located under decks and balconies, rather than the construction materials that result in ignition. To harden a home's deck and balconies, or any cantilevered addition, enclose the projection all the way to the ground and keep it ember-resistant by sealing cracks and joints. It is also important to maintain these areas clear of debris and to resist the temptation to stack flammable items like firewood near them.

There are also many appropriate fire resistant building materials for decks and balconies for those living in high fire risk areas. Heavy wood decking, if protected by excellent defensible space, may be allowed, but a better choice might be fire-retardant treated wood (FRX) if you want a wood deck. Other naturally fire-resistant choices (not non-combustible) are available; consult the Building Materials Listing—Search Listing Services[17] to see the latest products.

Composite decking[18] manufacturers are developing fire-resistant products as well; ask your local building supplier if they carry products that are especially formulated for wildfire hazards. There are a growing number of products on the market designed for wildfire safety. The key to remember is that building or retrofitting with the right decking must be combined with good debris maintenance and keeping the area clear of flammable items.

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[17] CAL FIRE, Office of the State Fire Marshal. (2007). *Building Materials Listing—Search Listing Services.* Retrieved from http://osfm.fire.ca.gov/licensinglistings/licenselisting_bml_searchcotest.php

[18] Deck boards manufactured from wood fiber and plastic to form a profile that requires less maintenance and generally has a longer lifespan than natural wood.

Retrofitting Your Home

While it is easier to construct a new home to a "fire-hardened" standard, it is also possible to dramatically improve an existing home's resistance to wildfire. If you live in an older home, you should begin your fire hardening improvements with the home and then work your way out from there. All of the recommendations above apply to both new construction as well as retrofits. Retrofitting your home with ignition-resistant materials and rigorously maintaining your defensible space will give you significant built-in protection.

Resources

The following resources can assist you in creating a hardened home with effective defensible space:

Ready, Set, Go: Hardening Your Home, www.readyforwildfire.org/hardening_your_home

Builders Wildfire Mitigation Guide, http://firecenter.berkeley.edu/bwmg/decks-1.html

Home Survival in Wildfire Prone Areas: Building Materials and Design Considerations, http://anrcatalog.ucdavis.edu/pdf/8393.pdf

Safer from the Start: A Guide for Firewise-Friendly Development, http://www.firewise.org/information/brochures-and-booklets.aspx

Is Your Home Protected From Wildfire Disaster? A Homeowner's Guide to Wildfire Retrofit is a bit dated but remains a great introductory resource. http://files.dnr.state.mn.us/assistance/backyard/firewise/isyourhomeprotected.pdf

There are many great online resources for fire-safe construction, several from the University of California, Berkeley. Their **Homeowners Wildfire Mitigation Guide**[19] has an easy-to-use format explaining the different areas of your home and what you can do to make each one fire safe. Their **Builders Wildfire Mitigation Guide**[20] has more information for those building or remodeling a home.

Creating Your Defensible Space

As stated above, homes ignite because of the little things—especially those items that are easily ignited by embers. This can happen even before the fire has arrived, or after it has passed. **There are many simple steps you can take to prepare the areas around your home for wildfire, in other words, to create your defensible space.** We focused above on what you can do to your home, the following sections will provide you some practical steps to prepare the area around the outside of your home for the eventuality of wildfire.

The California Department of Forestry and Fire Protection (CAL FIRE) defines defensible space as:

> "…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 protects your home from catching fire—either from direct flame contact or radiant heat. Defensible space is also important for the protection of firefighters defending your home."[21]

Firefighters sometimes use the terms "winners" and "losers" (preferable terms are "defendable" and "not defendable") to distinguish between those houses with defensible space versus those that do not have it. In a larger emergency situation (where many homes are threatened), homes without defensible space may get passed over in favor of protecting those with defensible space, which have a greater chance of survival and offer firefighters a safer environment. Firefighter safety is often more threatened in structure protection, i.e. homes and buildings, than in wildland situations. Homeowners should provide an inviting condition; after all, firefighters may be your friends, neighbors, or relatives. If it is too dangerous for firefighters to get in and out of an area, they are instructed not to risk their lives and equipment to save something that is not defensible.

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[19] University of California, Division of Agriculture and Natural Resources (UCANR). (2012.) *Homeowner's Wildfire Mitigation Guide.* Retrieved from http://ucanr.edu/sites/Wildfire/

[20] UCANR. (n.d.) *Buildiers Wildfire Mitigation Guide.* Retrieved from http://firecenter.berkeley.edu/bwmg/default.html

[21] CAL FIRE, Ready for Wildfire. (2012.) *Defensible Space.* Retrieved from http://www.readyforwildfire.org/defensible_space

Interface Fuels

Throughout the state, one of the greatest threats to home survival in wildfire events is the presence of *interface fuels*—meaning anything related to human development that is flammable. In other words, interface fuels include everything people have brought into the area that has the potential to burn—homes, belongings, ornamental vegetation, etc. It is this interface fuel that must be contended with to maintain effective defensible space.

Generally, interface fuels, also known as "*urban fuels*" in California, can be grouped into three categories:

1. Urban structures—Flammable structures of any kind: homes, businesses, schools, any and all outbuildings such as sheds, fences, gazebos, play structures, etc.

2. Landscaping—Flammable vegetation of any kind growing in the human environment. Includes all horticultural plantings and vegetation in the areas associated with human development without distinction between native or exotic, live or dead.

3. Urban "debris"—Anything else that is flammable and does not fall into the above two classes, such as wood piles, doormats, outdoor furniture, toys, tools, vehicles, the 2x4 that the outdoor faucet is attached to, etc. In other words, flammable materials of any kind stored in areas associated with human development.[22]

The term "urban fuels," (or in our case, "interface" fuels) is also used in California to describe all the ornamental plants we have added to the landscape. Even though it may look lush and inviting around homes, it is often that very vegetation that is the cause of home ignition during wildfire. It is possible to maintain some ornamental landscaping and be fire safe. However, this requires paying attention to horizontal and vertical separation of fuels,[23] especially separating any and all urban fuels from directly impacting your house.

Defensible Space and Fire-Resistant Landscaping Basics

We will explain how to create your defensible space in detail in the pages that follow in this chapter. Here is a summary of some of the basics to keep in mind.

- Provide a minimum of 100 ft. clearance of flammable materials around your home. Clearance does not mean dirt or gravel–it's about *flammability*—remove things that are easily ignitable from this area. If you live on a hill, you should extend this up to 200 ft., depending upon the steepness of the *slope* and the presence of surrounding fuel.
- Landscape your defensible space with fire-resistant plants. While no plant is immune to fire, certain plants do exhibit traits that can slow or reduce the spread of fire. Most deciduous trees and shrubs are fire-resistant. Fire-resistant plants generally look green (not brown), healthy, and vibrant. In addition, they have:
    - Leaves that are moist and supple;
    - Little dead wood, and tend not to accumulate dry, dead material within the plant;
    - Sap that is water-like (versus thicker or stickier) and does not have a strong odor.[24]
- Keep your gutters and roofs clean of vegetation and debris, especially redwood, Douglas-fir, and/or pine needles.
- Move all flammable materials (such as firewood or propane tanks) at least 30 ft. from homes or structures.
- Remember the other species that share the land. Leave a vegetation buffer around streams and other wildlife corridors.

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[22] Fotheringham, C.J. & Taylor, R., personal communication, March 2010.

[23] *Fore more information on horizontal and vertical separation of fuels, please see Zone 2 text, in Section V.I.2 below.*

[24] Fitzgerald, S. & Waldo, A.J. (2002, April). *Fire-Resistant Plants for Oregon Home Landscapes.* Redmond, OR: Oregon State University Extension Service. Retrieved from www.fs.fed.us/r6/centraloregon/local-resources/images/fires/pimpact-plant.pdf.

Note: Defensible space and clearing does not mean that you denude or clearcut your property. Rather, your goal is to remove the most flammable materials. Balance your fire-safety actions with general *ecosystem* health. Don't disturb the ground around streams or you will cause *erosion* that will harm fish. If you have the good fortune to live along a stream or river with fish in it, make sure you stay at least 100 ft. away from the stream or outside of the Streamside Management Area (SMA) in your clearing activities. It's okay to remove some dead vegetation there (like *pruning* in your garden). However, don't take out live vegetation—especially trees—near streams or rivers. Always maintain a dense shade canopy for the fish. Finally, many species of wildlife—such as bear, fox, bobcat, songbirds, and others—use streams as corridors in which to move from one area to another. Leave them some cover to be able to do this without disturbing you, or vice versa. If you feel that more intensive treatment is necessary near a stream (which may be the case in some instances), contact the Humboldt County Planning and Building Department to determine if a Special Permit is required for work within the Streamside Management Area. County Planning and Building may be reached by calling (707)-445-7541, or visiting www.co.humboldt.ca.us/planning/. *See section V.4.2 for more information on SMAs.*

Spend a few hours reviewing your home and property with the *Home Risk Assessment* tool (*See Appendix E).* Identify where you are safe and what other steps you need to take to protect your home and family. You can get help with identifying fire safety and defensible-space issues around your home. Contact your local *fire safe council* (FSC), fire department, or other fire agencies for more information on defensible space:

- **Humboldt County Fire Safe Council** (HCFSC): (707) 268-3736, cimmitt@co.humboldt.ca.us, or www.co.humboldt.ca.us/natural-resources/fire_safe_council/
- Contact information for **local fire safe councils** can be found in the Community Preparedness section of Part II. Risk Assessment, or in the Planning Unit Action Plan in Part IV for the area they serve.
- Contact information for **local fire departments** can be found in the Planning Unit Action Plan in Part IV for the area they serve or in the Annual Report posted each year on the HCFSC website: http://www.co.humboldt.ca.us/natural-resources/fire_safe_council/fireserviceannualreport.aspx
- **California Dept. of Forestry and Fire Protection** (CAL FIRE): Mark Rodgers, 707-726-1206
- **US Forest Service**: Robert Rivelle, 707-441-3604
- **US Bureau of Land Management** (BLM): Tim Jones, 707-825-2306

V.1.2 Fuel Reduction Zones for Your Property

Cohen's Home Ignition Zone[25] can be divided into three sub-zones. The zone concept can help you break up your property to develop the appropriate treatment for each area. The concept of *fuel reduction* zones around your home is now common. Several organizations have developed their own set of literature on fuel reduction zones, including:

- California Fire Safe Council, *A Homeowner's Guide to Fire-Safe Landscaping*: www.firesafecouncil.org/education/attachments/landscapingbrushland.pdf
- Firewise, *Communities Compatible with Nature*: www.firewise.org/~/media/Firewise/Files/Pdfs/Booklets%20and%20Brochures/BrochureCommunitiesCompatibleNature.pdf
- California Board of Forestry, *General Guidelines for Creating Defensible Space*: www.fire.ca.gov/CDFBOFDB/pdfs/Copyof4291finalguidelines9_29_06.pdf
- CAL FIRE's "Ready, Set, Go!" Program, *Wildfire is Coming- Is Your Home Ready?*: http://www.readyforwildfire.org/docs/files/CALFIRE_Ready_Brochure.pdf

[25] *See Section V.1.1 above for more information on the Home Ignition Zone.*

- University of California Division of Agriculture and Natural Resources, *Home Landscaping for Fire* at: http://firecenter.berkeley.edu/docs/CE_homelandscaping.pdf

These various classifications all follow the same basic concept of increasing the intensity of your fuel-reduction efforts the closer you work to your home or other buildings. The following zones are used in this CWPP:

Zone 1: The Lean, Clean, and Green Zone (Sometime referred to as the Structure Protection Zone or the Home Defense Zone) extends from your home out to thirty feet. Within this, we like to refer to your house and the first five feet surrounding it as the **Fire-Free Zone,** which should be made of concrete, gravel, sand, or rock, or some other non-flammable surface. It can include irrigated plants if they are low-growing, well-watered, and not touching your house. Remove any and all flammable materials in this zone, especially during *fire season*. The most important objectives of this zone are homesite protection and thorough fuel reduction. The main focus of the **Lean, Clean, and Green Zone** is to keep all vegetation healthy and green. The objective in this zone is to keep all flammable fuels away from your home to facilitate fire protection. The idea is to reduce or remove any and all fuels that could threaten your home such as dry vegetation, clutter, and debris.

Zone 2: The Reduced Fuel Zone (Sometime referred to as the Defensible Space Zone) extends 30 to 100 feet or to the property line, whichever is greater. In this zone you will encounter more wildland characteristics and will need to begin to balance your fire safety and conservation goals. Both fuel reduction and ecosystem health are objectives here. In this zone, efforts need to be made to break up the vertical and horizontal spacing between plants and eliminate *fire ladders* – which are the continuous line of vegetation from the ground into the upper branches of trees. The objective is to minimize the chance of fire jumping from plant to plant by removing, separating, and/or *thinning* the vegetation.

Zone 3: The Wildland Fuel Reduction Zone is the last zone, extending from the Defensible Space Zone out an additional 100 to 200 feet or farther. This is the zone where you will carry out wildland fuel-treatment prescriptions. The objective here is to aid in the health and productivity of your wildland while conserving natural values. Within this zone, restoration work can be coupled with fuel reduction efforts for the long-term health, resiliency, safety, and productivity of the more remote areas of your property.

Zone 1: Lean, Clean, and Green Zone

Once you have your home hardened, you can start moving outward from the structure. Within the Lean, Clean and Green Zone, we call the first five feet the **Fire-Free Zone.** This is the area immediately surrounding your house. Remember that embers landing on your roof will fall into this zone. Ground cover should be gravel, sand, rock, or some other non-flammable surface. It can include irrigated plants if they are low growing, well watered, and not touching your house.

The true test of whether your home is adequately hardened and your Fire-Free Zone sufficiently prepared is to imagine someone coming over on a hot, windy day with a box of wooden matches. If this person were to walk around your house lighting and tossing matches at or near the structure, is there anything at all that might ignite (i.e. catch fire)? If not, congratulations, you've passed. If there is anything that could ignite, you need to begin your fire-safety efforts there, to ensure that this zone is truly fire free.

Another approach is to think about your home in terms of flammability. When you start a campfire or a fire in your woodstove, small pieces of wood and paper are required to ignite split wood, then the bigger logs. The same is true for your home. Anything around your home that will ignite easily can and will threaten the larger structure. It can serve as "kindling" for your house in the event of a fire. Start your fuel-reduction efforts by removing any of this "kindling" around your house, especially any dead or dying vegetation. Once you do this, you may begin to see the area differently. You are beginning to gain a fire-safe perspective of your property. You may be surprised at what you begin to notice.

The following *Best Management Practices* summarize specific steps you can take to create your Fire-Free Zone.[26]

Zone 1: Fire-Free Zone Best Management Practices

- Use gravel, sand, rock, or other non-flammable surface wherever possible.
- Only use non-flammable *mulches* (e.g. not redwood bark or straw).
- Ensure that all plants in this zone are low growing, well watered, and not flammable.
- Remove all dead and dying vegetation; prune dead material frequently on any vegetation in this zone.
- Remove overhanging dead branches in proximity to your roof.
- Prune trees at least 10 feet away from structures and chimneys; ensure that they are free of any dead wood.
- Clean all dead leaves from your roof and rain gutters.
- Plants can be in pots, as long as they are moved away during extreme fire conditions.
- Remove all flammable materials, including baskets, pinecones, brooms, furniture, hanging plants, etc.
- Make sure your decks, porches, and landings are free of clutter, and that anything remaining can be quickly and easily moved into your house or garage, or at least 30 feet from all structures.
- Review your home and this area using the kindling concept described above. Look for anything that would catch fire if an ember landed on it and was left alone to smolder.

The remainder of the Lean, Clean, and Green Zone—from five feet to 30 feet—should be maintained so that it will not support the spread of fire to you home. Keep any vegetation here healthy and green, using fire-resistant plants, while conserving precious water resources. Keep any flammable items well separated from each other. Think of fuel separation both horizontally and vertically. Vertically, you don't want plants or grass on the ground to be connected to shrubs, and then those to higher trees, decks, or your roof. Horizontally, think about fences connected to houses that are then touching shrubs and/or trees further out, which could facilitate a path for fire to travel to your house (or vice versa); or a deck that is next to branches of shrubs or trees. Remember that your house is a major fuel source itself.

In Humboldt County, residents are required:

> "To reduce the intensity of wildfire by reducing the volume and density of flammable vegetation, …. all parcels one (1) acre and larger shall provide a minimum 30 foot setback for buildings and accessory buildings from all property lines and/or the center of a road, except as provided herein."[27]

Parcels under one acre in size that cannot meet the 30-foot Fire Safe setback requirement can apply for a "SRA Small Parcel Setback Exception," to have that area reduced. To qualify, you must meet the WUI Building Standards, other requirements may also be asked of you, depending on how much the setback is reduced. You can find the Setback Exemption application on the County's website at: http://co.humboldt.ca.us/planning/building/documents/sra_exception_forms.pdf.

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[26] Best Management Practices throughout this chapter are taken from the following sources:

ForEverGreen Forestry. (n.d.) Retrieved from www.forevergreenforestry.com; University of California Cooperative Extension (UCCE). (n.d.) *Sustainable and Fire*: *Safe Landscapes*. Retrieved from http://ucanr.edu/sites/SAFELandscapes/; UCCE. (n.d.) *Master Gardeners of San Mateo and San Francisco Counties.* Retrieved from http://ucanr.org/sites/MGsSMSF; CAL FIRE,Ready for Wildfire. (2012).; CAL FIRE. (2012). *Fire Safety Education.* Retrieved from http://calfire.ca.gov/communications/communications_firesafety.php; Firewise Communities. (2012). *Communities Compatible with Nature.*

[27] *See Appendix F: County Fire Safe Regulations, or:* County of Humboldt, Planning and Building Department. (n.d.). *Fire Safe Regulations.* Building Inspection Division. Retrieved from http://www.co.humboldt.ca.us/planning/building/; SRA Exemption Request Forms are also available at this website.

Zone 1: Lean, Clean, and Green Zone Best Management Practices

- Separate all fuels (anything that can ignite and burn) both horizontally and vertically from each other and from your home. Create this separation between trees, shrubs, and items that could catch fire, such as patio furniture, wood piles, swing sets, etc.
- Keep lawn chairs, umbrellas, and other canvas furniture a safe distance from structures. These can be easily ignited from sparks.
- Trim trees regularly to keep branches a minimum of 10 feet from other trees. Keep canopies of large trees separated by 10 to 30 feet depending on the slope (the steeper the slope, the more space is needed).
- Remove or prune flammable plants and shrubs near windows.
- Clear all vegetation and other combustible or flammable materials from around and under deck areas.
- Remove all climbing or vining plants that connect your home to anything flammable.
- Prune, trim, or remove highly flammable species such as eucalyptus within 50 feet of any structure. Replace with less-flammable native species such as oak and maple.
- Pull weeds or weed-whip/weed-whack weeds before seed heads mature to reduce fire hazard and the spread of *invasive plants*.
- Utilize primarily low-growing plant material, less than 4 feet in height, with the exception of trees. Plants should have low fuels and be fire-resistant.
- Cut or mow annual grass down to a maximum height of 4 inches.
- Keep vegetation watered and free of dead material.
- Irrigate to maintain high *moisture content* in plants, but do not over-water. Prevent irrigation from flowing out of this area (except under extreme drought conditions); this is to avoid encouraging plant growth in the Reduced Fuel Zone (see below).
- Remove all debris *(slash)* from fuel-reduction efforts.
- Enclose underside of elevated decks with fire-resistant materials.
- Ensure that structures such as fences are made of noncombustible or *1-hour* fire-rated materials.
- Call your local utility company for a yearly inspection if utility lines touch any trees on your property.
- Remove or separate wood decks, fences, and other flammable structures and materials wherever possible.
- Stack wood at least 30 feet from structures; remove flammable vegetation within 10 feet of any woodpile.
- Remove all stacks of construction materials, needles, leaves, and debris.
- Locate fixed butane, propane, and/or diesel tanks at least 30 feet from any structure and with at least 30 feet of clearance from any flammable materials.
- Provide a minimum of 3 feet of clearance around all fire hydrants.
- Ensure that all your fuel-reduction efforts are done safely and never cause a fire. For example, do not use metal blades during dry weather, as they can spark on rocks and ignite nearby vegetation.
- Maintain this zone free of flammable materials throughout the year.

Figure V.1-2. Fire-Resistant Plant Characteristics[28]

Remember, any plant can burn under the right conditions. For all plants, make sure to trim back and remove any dead vegetation and *litter*. When choosing species to plant or keep when performing *fuel modification*, look for plants with fire-resistant characteristics:

- Able to store water in leaves and stems
- Produce limited dead and fine material
- Extensive, deep root systems for controlling erosion
- Maintain high moisture content with limited watering
- Low-growing or prostrate form
- Open loose branches with a low volume of total vegetation
- Low levels of volatile oils or resins
- Ability to re-sprout after a fire
- Slow growing with little maintenance needed
- Not considered invasive

The moisture content of plants is important because high levels of plant moisture can lower fire risk and act as a heat sink, reducing the intensity and spread of fire.

Characteristics of Flammable Plants

Consider removing plants from your property and avoid purchasing new plants that tend to retain large amounts of dead material within the plant, produce a large volume of litter, and contain volatile substances such as oils, resins, wax, or pitch.

See www.bewaterwise.com/fire.html for fire-resistant and drought-resistant California plants.

Zone 2: Reduced-Fuel Zone

The Reduced-Fuel Zone extends from your home out to a distance of approximately 100 feet. **In many suburban and *exurban* settings this zone extends onto neighboring properties and may include nearby homes, so cooperation with neighbors is essential.** In this zone you will encounter more wildland characteristics and will need to begin to balance your fire safety and conservation goals. See the before and after photo below illustrating management in the Reduced-Fuel Zone.



[28] UCANR. (2009, March). *Making Your Property Fire-Safe* [Fact sheet]. Los Angeles County: UCCE. Retrieved from http://groups.ucanr.org/SAFE/files/72154.pdf © 2007 Regents of the University of California. Used by permission.

Figure V.1-3. CAL FIRE Minimum Vertical Clearance



Much of what you need to do comes down to common sense and an awareness of your physical surroundings. An important concept to understand is that of *fuel ladders*—the continuous line of vegetation from the ground into the *canopy* (or upper branches) of trees. The concept of *fuel continuity* is similar and includes both vertical and horizontal directions. Vertical continuity is the fuel ladder concept; horizontal fuel continuity thus means a continuous horizontal line of fuel (usually on the ground). In the latter case, the fuel extends from something—like your house—continuously out into the wildland. A good example of this is seen with decks on steep slopes, where the edge of the deck is next to the crowns or tops of the trees (forest canopy). If a fire started either at the house or in the forest, it would have a continuous line of fuel to spread from one to the other via the deck. *(See "Hardened Homes" above, regarding fire-safe construction for information about how to mitigate this hazardous situation).*

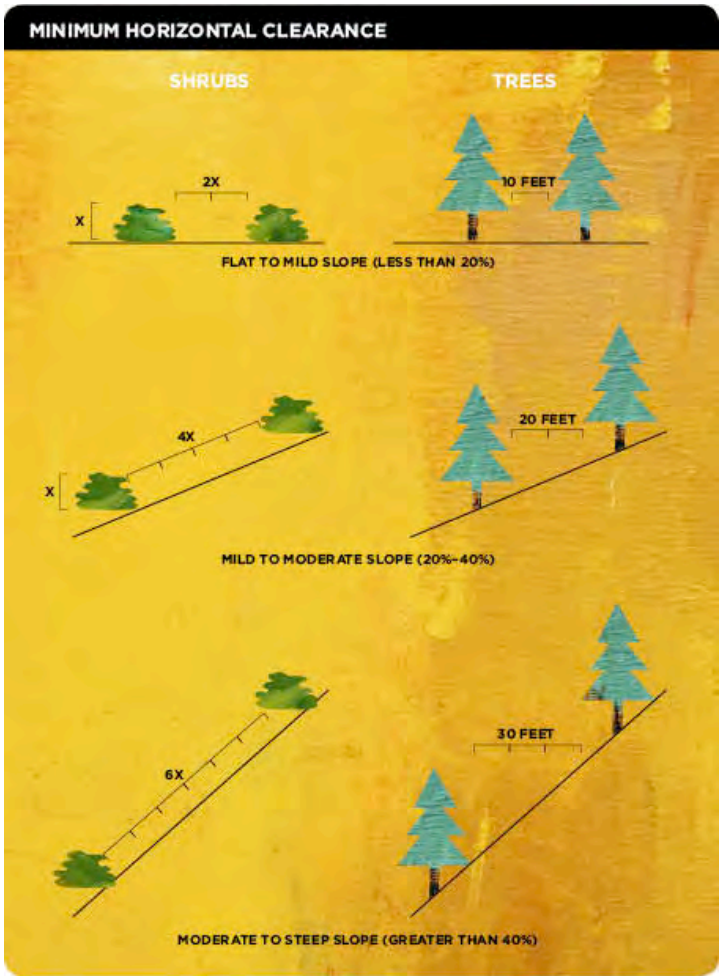
The CAL FIRE graphics in Figures V.1-3 and V.1-4 on this page illustrate the concepts of vertical and horizontal separation of fuels.[29]

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

To reduce forest-type ladder fuels, start in the *wildlands* within 100 ft. of your home, and along your roads. Remove brush on the ground (but don't scrape it clean as this could cause erosion problems when it rains). Removing ground fuels does not mean removing everything growing on the ground. Rather, you can leave clumps of vegetation. The objective is to leave vertical and horizontal space between fuels (in this case, plants).

To achieve ideal vertical spacing, *limb up* or prune young trees (remove the lower limbs to create

Figure V.1-4. CAL FIRE Minimum Horizontal Clearance



[29] CAL FIRE, Ready for Wildfire. (2012). *Defensible Space.*

open space between the tree canopy and ground) to a minimum of 6- to 10-feet aboveground. If you leave clumps of shrubs, create at least three times the shrub height in space before the bottom branches of the trees. For example, if you have a 3-ft.-high bush, leave 9 ft. of open, clear space (no vegetation) below the bottom branches of the nearby trees, *(see Figure V.1-3)*. To reduce the chance of shock, young, short trees should be pruned higher incrementally. A rule of thumb when limbing trees is to leave at least one-half to two-thirds of the tree's height in live canopy so you don't harm its ability to grow. You can remove more later—do it in stages so the tree has a chance to adapt.

Horizontal spacing is also important to slow the spread of a fire. Figure V.1-5[30] below (and the figures on the previous page) show how much space you need to have between your trees in your defensible-space area. Note: The clearance suggested in this table is appropriate for the smaller Lean, Clean, and Green Zone, (i.e. within 100 ft. of structures or roads). However, it is often too much canopy opening for wildland areas. This is because the opening in the vegetation will likely increase the amount of sun on the ground and encourage more shrub and herbaceous *understory* growth, increasing these fuels.

In some places it is enough to only *brush* (clearing or "cleaning up") an area. *Brushing* entails removing brush alongside a road or structure to keep the ground relatively open. Removal of all *dead plant matter*—shrubs, branches, etc.—is especially important. The idea is to remove anything that is particularly flammable from anywhere near an *ignition source*, such as you, your kids, your car, or your house. When brushing or removing fuel ladders, focus on the fine or *flashy fuels* such as small sticks as these can ignite quickly. If you remove this "kindling" around your larger fuel sources (e.g. large trees, your home, other structures), chances are much greater that those fuels will not ignite. In the forest, make sure there are not concentrations of small sticks or brush against tree trunks.

Figure V.1-5. Plant Spacing Guidelines for Structural Protection and Defensible Space Zones

Plant Spacing Guidelines

Guidelines are designed to break the continuity of fuels and be used as a "rule of thumb" for achieving compliance with Regulation 14 CCR 1299.

Trees	**Minimum horizontal space from edge of one tree canopy to the edge of the next**	
	Slope	Spacing
	0% to 20 %	10 feet
	20% to 40%	20 feet
	Greater than 40%	30 feet
Shrubs	**Minimum horizontal space between edges of shrub**	
	Slope	Spacing
	0% to 20 %	2 times the height of the shrub
	20% to 40%	4 times the height of the shrub
	Greater than 40%	6 times the height of the shrub
Vertical Space	**Minimum vertical space between top of shrub and bottom of lower tree branches:** 3 times the height of the shrub	

[30] CAL FIRE, State Board of Forestry and Fire Protection. (2006). *General Guidelines for Creating Defensible Space.* Retrieved from http://calfire.ca.gov/cdfbofdb/pdfs/4291finalguidelines2_23_06.pdf

Zone 2: Reduced-Fuel Zone Best Management Practices

- Start by measuring how far 100 feet actually is from your home, so you have a clear concept of where you need to work, and where not. It isn't as far as many people think. Remember that on a slope you will have to figure out how far to go to get a 100-foot horizontal distance from your structure. The steeper the slope and the greater the amount of fuels below your structure, the greater this distance will be. Your local fire department can help you determine what is necessary. You are not responsible or authorized to work beyond your property line unless provided permission by the other landowner.
- Continue to separate fuels in this zone both horizontally and vertically, and *"feather out"* your treatments as you go, meaning less treatment the further you get from your house.
- Choose landscaping plants that are drought-tolerant and fire-resistant.
- Leave a buffer of less-treated vegetation around *sensitive habitats*. This will help maintain the normal conditions within the sensitive habitat and make it more useful to wildlife.
- Cut or mow annual grass down to a maximum height of four inches.
- Keep shrubs low (18 inches or less in height) and widely spaced (The spacing depends on the slope of the property, see Figure V.3. CAL FIRE Minimum Horizontal Clearance graphic above).
- Space trees to allow a minimum of 30 feet between canopies at maturity. Thin and trim trees to maintain adequate spacing from other trees (spacing will also depend on slope).
- Remove lower limbs within a minimum of six-to-ten feet off the ground, or prune lower branches to one-third the height of the tree (use the latter measure if the tree is less than 18 feet tall).
- Selectively thin and prune native or naturalized vegetation to preserve the natural appearance of the area while reducing the amount of flammable vegetation. Regularly remove dead branches, leaves, and related materials.
- To help prevent future *erosion* on steep slopes, balance clearance versus erosion control. Thin shrubs to reduce fuel volume. Don't excavate, remove, or disturb existing plant root systems.
- Inspect vegetation regularly and maintain it periodically. Maintain single trees, ornamental shrubbery, and ground covers to ensure they do not readily transmit fire from the surrounding vegetation to your structures.
- Provide clearance of minimum 100-feet upslope from structures located mid-slope.
- Remove only dead materials in *riparian* (wet) areas. (These will likely be Streamside Management Areas, see Section V.4.2. Environmental Protection Compliance, below for more information.) Consult a resource professional and or the Humboldt County Planning and Building Departments before disturbing any soil in these sensitive areas.
- Don't irrigate here except under extreme drought conditions that threaten your perennial vegetation, as irrigation encourages further vegetative growth, often of flashy fuels.
- Remove all debris and trimmings from the site. Chip native vegetation on-site up to a maximum depth of six inches to help prevent erosion, retain soil moisture, and reduce material going to landfills. Rake chips away from base of trees and shrubs out to the *drip line* of these plants to prevent root rot or rot at the base of the plants. Do not allow chips to accumulate on or underneath any groundcover.
- Remove all stacks of combustible materials.
- Provide a minimum of three feet of clearance around all fire hydrants.
- Keep fire access roads clear to sky.

Figures V.1-6[31] and V.1-7[32] below demonstrate how to properly prune your trees and other plants. Figure V.1-2 in the section above (Zone 1: Lean, Clean, and Green Zone) describes characteristics of fire-resistant plants.

Figure V.1-6. Pruning for Healthy Plants

Pruning for Healthy Plants

Most plants will benefit from occasional corrective pruning, and all will benefit from the removal of dead wood. Time the pruning of individual plants over several years to allow them to recover. Try pruning about a third of your plants in a given year, so that all are pruned at the end of three years.

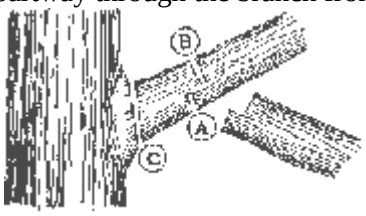
Regularly remove dead material and branches from trees and shrubs. For deciduous trees and shrubs, prune before they lose their leaves, when it is easier to see the dead branches.

Hand-prune inside branches to reduce flush of growth. Hedging and shearing alone result in weak, fast growth and more fuel.

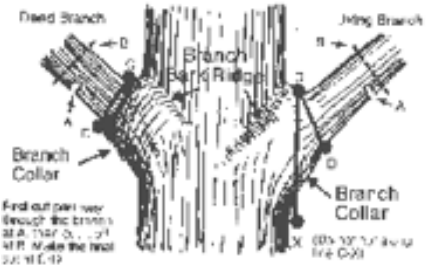
Figure V.1-7. Proper Pruning Techniques

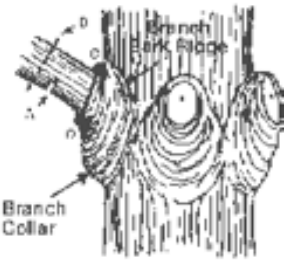
Prune correctly. The object of the operation is to remove the branches as close to the tree stem as possible without leaving any stubs.

A. Cut partway through the branch from beneath at a point one or two inches from the trunk.



B. Make a second cut on the top of the branch, at a distance of 1/3 to 1/2 the diameter of the limb from the first cut. This should allow the length of the limb to fall from its own weight and be safely removed.
C. Complete the job by making a final cut next to the trunk, just outside the branch collar, with the lower edge farther away from the trunk than at the top.





Using the illustrations above, final cuts should be made from points C to D. Do not cut along C–X, which is an imaginary vertical line to help you locate C–D. First cut partway through the branch at A, then cut it off at B. Make the final cut at C–D.

[31] UCANR. (2009, March). *Making Your Property Fire-Safe* [Fact sheet]. Los Angeles County: UCCE. Retrieved from http://groups.ucanr.org/SAFE/files/72154.pdf © 2007 Regents of the University of California. Used by permission.

[32] California Forest Stewardship Program. (2002). Prune trees for better health and higher value. *Forestland Steward* Newsletter, Winter 2002. Retrieved from http://ceres.ca.gov/foreststeward/pdf/newslettr21.pdf

Zone 3: Wildland-Interface Zone

Finally, the Wildland-Interface Zone (or the Wildland Fuel-Reduction Zone) extends from your house out to 200 feet, or (under special circumstances) even further—an exception being on very steep ground where Zone 2 extends beyond 200 ft. This is the zone where you will carry out wildland fuel-treatment prescriptions. The objective here is to reduce fire intensity to the point where firefighters can safely work next to the home to protect a structure from ember ignition.

Fuel treatment prescriptions in this zone can be designed to function within a range of conditions. A key concept to consider is that under a worst-case scenario (triple-digit temperatures, single-digit *relative humidities*, and high winds on steep terrain), the effects of a *fuelbreak* (i.e. a break in the fuels, or barrier, intended to stop or check a spreading fire) will likely be minimized, especially if the prescription was less than extreme. However, there is a very low likelihood of extreme fire conditions existing on the day that your fuelbreak in particular gets tested.

The Wildland Interface Zone can be treated similarly to roadside *shaded fuelbreaks* as well as more amorphously shaped units on the landscape. *For more detailed explanations of prescriptions, fuelbreaks, and slash disposal, please see the section Fuel-Reduction Treatment Methods below.*

For any *treatments* that extend beyond your Home Ignition Zone into the native landscape, you will need to ensure that you are meeting all *environmental compliance* regulations (*see Section V.4.2 Environmental Protection Compliance for more details).* Generally, but not always, if you are following conservation principles and the best management practices in this CWPP, your actions will be consistent with these regulations. However, you will likely still need to complete the required documentation before beginning any fuel-management actions.

Balancing Fire Safety with Ecosystem Health[33]

A healthy forest is *resilient* to fire, as well as other potentially negative impacts such as *pathogens.* An important distinction to consider is that resilience does mean immunity; *disturbance* is natural and necessary in any ecosystem. The key concept is balance, both within the ecosystem itself and between the ecosystem and the human values and developments that reside within it. One example of this is *snags* (standing dead trees). Snags provide important wildlife habitat, but also can be serious problems for *fire suppression*. They are often vectors for *spot fires,* distributing embers from burning portions high above the ground; they can also be extremely dangerous to cut, especially during fire suppression. With this in mind, one way to balance safety and ecological goals is to leave snags in areas where they're not likely to threaten human development if they do ignite; for instance, leave shorter snags in a riparian area well below a home rather than taller ones on a ridge above a home. This concept of balancing can help you decide which trees and shrubs to leave versus remove. Education is key to analyzing how the physical characteristics, location, and relation to surrounding individual plants all relate to both fire safety and ecological function. Having all the information and balancing factors in mind, you can choose to leave particular plants in areas where they minimize undermining one goal or another, and maximize both ecological health and fire safety.

Ecological fuel reduction seeks to reduce surface fuels, ladder fuels, and *canopy density* (the volume of easily ignitable materials like foliage and dead twigs in the canopy of a stand of trees) while implementing treatments that work to enhance plant community health and *biodiversity*. Ecologically based fuel-reduction techniques assist degraded ecosystems in becoming more stable, resilient, and *productive.*

Fuel treatments are designed to be site-specific; they take into consideration vegetation, soil types, slope, aspect, ecosystem-health needs, and individual landowner objectives. Fuel-reduction objectives are most successfully accomplished when combined with an emphasis on ecological treatments. In the forest, these include *forest stand enhancement* and restoration techniques such as thinning and *controlled burning*.

Methods for ecological fuel reduction seek to strike a balance among the following:

[33] This section is based on previous work by: Bey, M. (n.d.). Lomakatsi Ecological Services. Retrieved from www.lomakatsi.org; and current work by: Kahan, D. (n.d.). Full Circle Forestry. Whitethorn, CA, for ForEverGreen Forestry (www.forevergreenforestry.com).

Goals

- To make all vegetative communities less susceptible to *crown fire*.
- To reduce. wildfire intensity through activities that separate surface and ladder fuel continuity and volume.
- To manage and modify fuels and configurations of trees and plants.
- To reintroduce low-intensity (cool-burning) fire.
- To positively contribute to the ecological processes and functions of local forest and *plant communities*.
- To improve the health of vegetation most suited to the site.
- To emulate a plant regime similar to what occurred with natural fire.
- To maintain and enhance native species diversity.
- To maintain and enhance wildlife habitat.
- To control problematic, invasive, non-native species.
- To provide erosion control where appropriate, in conjunction with fuel-reduction activities.
- To make fire-suppression efforts safer and more effective as a result of reduced *fuel loads* in the vicinity of roads, homes, and other important areas.
- To utilize byproducts of fuel-reduction activities where ecologically appropriate and economically feasible, to help offset costs.

Methods

This document proposes methods that emulate lightning and other *anthropogenic* low-intensity fires that have helped shape the landscape for thousands of years. These methods include:

- Selectively thinning portions of the forest or shrub understory.
- Selectively thinning or burning dense vegetative communities such as *chaparral*.
- Favoring and retaining the largest, most fire-resilient, and healthiest trees adapted to the location.
- Favoring and retaining native vegetation.
- Burning, chipping, and/or masticating the smaller fuel loads

Zone 3: Wildland-Interface Zone Best Management Practices

- If not experienced with this work and/or familiar with the concepts presented, err on the side of conservatism; better to necessitate another entry than to apply too intensive a treatment. Contact a Registered Professional Forester or other resource professional to provide you with guidance.
- Conversely, if you are confident intellectually that an individual plant should be removed, do so; focus more on what is left in the forest rather than on what is removed. Make the treatment function as intended.
- Be thorough in implementation to reduce and delay maintenance needs; apply patience and discipline to work methodically to achieve this with less time and effort.
- Monitor how conditions change from one spot to the next and modify prescription applications accordingly.
- Favor healthy individuals of native species.
- Foster biodiversity.
- Focus on the big picture – don't create one problem in the course of fixing another.
- Address multiple issues where appropriate and feasible (e.g. use some cut materials to stabilize soil).
- Take great care while pruning – it is one of the more difficult skills to master but one of the most important to avoid negative impacts. *(See Figures V.1-5. Pruning for Healthy Plants and V.1-6. Proper Pruning Techniques above for more information.)*
- Work within your skill and comfort range. Utilize protective gear and maintain communication with co-workers and bystanders. Take time to mitigate known hazards and expect the unexpected to avoid accidents.
- Educate yourself on ecological health for your *vegetative types*, then restore, enhance, and maintain.
- If working within *Sudden Oak Death* (SOD) infestation, clean tools, boots, and vehicle wheels and wheel wells before working anywhere else.
- Monitor effects over time to inform subsequent treatments.
- Mow or graze grasses and small woody plants.
- Savor the gratification inherent in doing good work for something important!

V.1.3 Fuel-Reduction Treatment Methods

This section provides detailed information about various methods of managing hazardous wildfire fuels. These methods are most applicable to the Wildland Interface Zone and beyond.

Fuelbreak vs. Fireline

Fuelbreaks usually differ from *firelines* in several respects. Firelines are constructed during fire suppression activities to arrest the spread of an existing fire, and are commonly scraped to *surface mineral soil* level with machinery or hand tools, along with an associated break in the overstory canopy. Fuelbreaks, on the other hand, can be natural or human-made, are generally a less invasive or extreme treatment, and are usually created prior to a wildfire in strategic places to facilitate *suppression*. Vegetation is manipulated to reduce the intensity of a fire, which may allow suppression personnel to *contain the fire* at that point, as well as providing a safer route for both residents to evacuate and suppression forces to enter and leave. Prescriptions for fuelbreaks can vary widely, especially between different vegetation types, with a range of methods available to implement them. As with most activities of this nature, it is important to consider ecological (and other) concerns to maximize the benefits, and to avoid creating one or more problems while fixing another. Aiming to achieve several goals at once, or *"stacking functions"* is a good approach when implementing these activities.

Forest and Woodland Shaded Fuelbreak

When creating a shaded fuelbreak, fuels are reduced and otherwise modified but the overstory canopy is either left intact or only partially removed, hence it is shaded. Shaded fuelbreaks create a break in the continuity of both surface and ladder fuels, which is critically helpful in preventing a *surface fire* (a fire burning on the ground), from becoming a *crown fire* (a fire travelling through the forest canopy). Surface fires can be subject to fire suppression, but crown fires require firefighters to retreat to a safer place.

It is important to understand here that the range of variability in all the factors determining the effectiveness of a fuelbreak is almost infinite. These include the stand conditions before treatment, as well as the prescription and the quality of its implementation, maintenance, *topography*, and the weather conditions at the time of the fire. Additionally, one must consider how all these factors differ in the adjacent, untreated area.

Location is the first consideration. FSCs, in conjunction with federal, state, and local agencies and other concerned groups and individuals, have been prioritizing and implementing regionally strategic fuelbreaks in Humboldt County for over a decade. For most private landowners, the first priority is home protection. Shaded fuelbreaks are appropriate in the outer layers of the concentric rings of treatment intensity that comprise defensible space around a home or other objects of value; i.e. the zone concept described above. It serves as the transition zone between the more rigorously crafted, near-home area (Zones 1 and 2), and the untreated wildland (Zone 3 and beyond). Consider the shaded fuelbreak as a buffer; the more effective it is at tempering an approaching fire, the more effective the inner structure protection zone can be. Likewise, if a home ignites independently of a wildfire, these treatments will help keep the fire from spreading to neighboring areas.

Defensible space treatments are undermined unless access routes are also managed in such a way as to provide a measure of safety. Two crucial realities are that most civilian deaths in wildfires come during evacuation; and suppression leaders will not deploy their people if they don't feel they have a safe evacuation path. A corollary to this is that the safer the evacuation route is, the longer firefighters can delay using it and stay to defend the home. The presence of shaded fuelbreaks can help improve evacuation routes, as they provide a place where fire might slow down or decrease in intensity, making it safer to get out. Shaded fuelbreaks can also offer firefighters a safer place to fight fires from; in addition to a break-up in the fuel continuity from which to station themselves, the shade also creates cooler temperatures. Once the defensible space zone and access routes are treated, a landowner may wish to locate fuelbreaks strategically to help compartmentalize a fire. Auxiliary roads, ridges, and flatter areas are likely places for additional strategic fuelbreaks. Wherever feasible, link features like rock outcrops, wet areas, and meadows together with fuelbreaks.

Most of the second-growth forests in Humboldt County would benefit from restorative management.[34] Motivated land stewards can integrate a comprehensive program to enhance forest ecological health and economic productivity across their landscapes, which would serve to complement fire security and afford the greatest levels of protection. Coordinating treatments with multiple adjacent landowners has great value in protecting larger areas and more homes.

Prescriptions can vary widely. General principles include:

- Reduce the volume of fuel.
- Adjust the types of fuel—eliminate as much as is feasible of the flashier fuels that function as kindling on the surface and in the understory, and reduce the amount of dead wood.
- Modify the structure and arrangement of fuels; break up fuel continuity both horizontally and vertically so as to make it more difficult for the fire to spread.
- Raise the height of the base of the canopy.
- Keep in mind that most of the fuel that burns and spreads the fire is finer and flashier (foliage and small diameter wood) and/or dead and seasoned.

An important decision to make initially is whether or not to open the *canopy*. Opening the canopy can reduce the potential for crown fire issues within the continuous canopy. However, it often involves tradeoffs. Opening the

[34] *For more information on restoration forestry, see*: Institute for Sustainable Forestry. (n.d.). Retrieved from www.newforestry.org.

canopy can create increased maintenance needs; sprouting species do so more vigorously when exposed to more sunlight through the gaps in the overstory. There are also increased risks of *windthrow* (if opening the canopy, consider doing so incrementally to allow for root systems to adapt), as well as greatly increased cost (which may be mitigated if removed materials have enough economic value). Another consideration is that if the canopy is opened, whatever lower branches remain will continue to grow; keeping the canopy closed will encourage lower branches to die back (self-prune), and will raise the height of the base of the canopy (the area where the lowest tree branches begin) over time beyond the reach of ground-based saws. This has additional economic benefit by producing more clear wood if these trees ever were to become *sawlogs*.

A general prescription commonly used in southwestern Humboldt—for mechanical treatment by hand crews with chainsaws—is to leave a closed overstory by retaining all *dominant* trees.

- Remove most of the snags.
- Eliminate surface brush and small trees overtopped by larger ones.
- Prune all *leave-trees* as high as safely and economically feasible.
- If budget allows, remove most if not all of the intermediate trees, utilizing them in the *felling* process to break mid-trunk branches off the leave trees higher than those which can be reached with a saw.
- Burn cuttings too small for firewood in small piles approximately 50 ft. apart, and then chip, or lop and scatter *(see Section V.1.4. What To Do With Thinned Materials, below for more information on these options).*
- If wood left in the forest is not to be utilized, cut it into sections to maximize ground contact and then scatter so they are left in one layer (not piled on top of each other).

Prescribed burning and/or mastication are other methods that can be used independently, or mixed and matched accordingly. Each of these techniques has its strengths, weaknesses, and tradeoffs. Resource professionals and reputable implementation contractors can help advise how best to determine and achieve goals. *(See Section V.1.4 below for more information.)*

It is advisable to proceed conservatively, especially at first, and if contemplating opening the canopy. Consider implementing the work sequentially to allow time for monitoring effects to show, and to allow leave-trees to adjust. Monitoring the response of the forest and ecological community will be the guiding influence on what time intervals to use for further thinning entries. Ecological monitoring can be accomplished by a visual assessment of the stand's response, *photo-point monitoring*, or by establishing permanent monitoring plots to closely measure ecological benefits or impacts.

Varying levels of light on the forest floor will generate different re-sprouting responses; therefore creating shaded fuelbreaks requires the commitment to maintain them. As in all fuel-reduction treatments, regular annual or bi-annual maintenance is often necessary as stump-sprouting plants, invasive species, and/or shrubs begin to colonize the understory (although this is theoretically minimized with the shade provided by the intact canopy). Maintenance can be accomplished either by pruning and cutting back re-growth, or through use of prescribed-burning techniques. Shaded fuelbreaks in appropriate locations provide a good opportunity for the use of fire.

Following thinning and controlled-burning applications, restoration of native grasses and forbs along shaded fuelbreaks is a long-term objective for the prevention of invasive species. In situations where treated acres border other properties, invasive species can travel into these neighboring public lands and "spread like wildfire;" hence it is critical that long-term stewardship principles be applied.

Shaded Fuelbreak Basic Prescription for First Entry[35]

- For the first entry, cut as much of the *1-hour* (0–0.24 inches in diameter) and *10-hour fuel* (0.25–1.0 inch in diameter)as possible, i.e. the finer fuel. Focus on the most obvious candidates for removal; those for which there is little or no question about removing.
- Start low in the area and work gradually uphill in a zigzag pattern. Prioritize the lowest-growing plants and then work up the fuel ladder. This will help keep you from burying your work, and the result will be cleaner and more thorough.

[35] This prescription is also based on the work of: Kahan,D. (n.d.) Full Circle Forestry. Whitethorn, CA.

- Remove trees that look brushy (versus a more tree-like form), or unhealthy, are lacking in vigor, or are overtopped by larger and/or more vigorous trees that block access to open spaces in the canopy.
- Eliminate dead vegetation of all sizes.
- Prune up all trees left behind as high as you can safely reach, with a chainsaw or pole saw.
- Ideally, work in teams with a sawyer and a brush hauler. This method requires teamwork and awareness, but will result in a more thorough job with less effort, once safety and logistical issues have been mitigated. The sawyer can make a small to moderate mess in one spot and then move to the next spot while the brush hauler cleans up the mess in the first spot. They then flip-flop and the sawyer returns to the first spot to expand upon what's been done, while the brush hauler cleans up the mess in the second spot. This method requires teamwork and awareness, and it will enable the sawyer to cut with more ease. Meanwhile the brush hauler is not in danger from falling trees and limbs.

Second Entry, or Advanced First Entry

- Go to those trees and shrubs that you weren't sure about on the first pass.
- Think about position in the *stand* hierarchy (how trees occupy space vertically, and to some extent horizontally), and *species composition*. You will generally want to favor less abundant species, if all else is equal.
- Compare the leaders (the annual new growth at the top of the tree which is a good indicator of vigor) of neighboring trees. Shake adjacent trunks to compare leaders of taller trees that are hard to see. Favor the healthiest and most vigorous trees. Is there space for them to grow in the upper canopy? If not, can you create that space by removing less desirable trees? If not, the tree is a good candidate for removal regardless of health and vigor. Imagine the same place in ten or twenty years. Will there be room for all the trees you have left to share space in the overstory without being overtopped? If not, consider removing more trees to achieve this objective.

How to Decide which Trees to Leave or Take

- First look for the vigorous, healthy trees that are in the overstory or can reach it with unimpeded access to overhead sunlight before the canopy closes. If trees that are similar in height, vigor, and health are growing in crowded conditions, consider retaining them all (until they differentiate and establish a hierarchy among themselves) to encourage prolonged self-pruning which will raise the base of the canopy beyond the reach of ground-based saws with no additional implementation costs.
- Apply "favored species criteria," if appropriate. For example, in southwestern Humboldt, it is common to find vigorous young Douglas-fir growing into and through the crowns of older, larger hardwoods like madrone and black oak. The fir will eventually shade out and kill the hardwood, has more flammable foliage, and functions as ladder fuel into the larger tree. The firs usually will not make viable timber and the hardwoods generally provide better wildlife habitat. Consider *girdling* firs tangled in larger hardwood crowns to remove them over time and mitigate felling hazards. (Girdling is a technique of killing trees gradually by cutting through the cambium and sapwood layer around the circumference of the tree so that its water and nutrient flow is cut off.) Encourage groves of fir in between the crowns of the big hardwoods.
- In areas where SOD is a concern, remove most if not all bay laurel (pepperwood, or *Umbellaria californica)* from the understory. Contemplate removal or girdling of overstory bay laurel (monitor results of SOD experimental *silvicultural* treatments from University of California Cooperative Extension (UCCE)[36] to help inform your decision). If girdling, be sure to remove all bark and *cambium* in a 24"-wide ring. Consider leaving trees of species other than tanoak that are overtopped by tanoak as potential replacements. If harvesting removed wood is an option, think about removing tanoaks that would otherwise be kept if suitable replacement

[36] *See:* California Oak Mortality Force. (2012). *Diagnosis and Management*. Retrieved from www.suddenoakdeath.org/diagnosis-and-management/, or visit: UCCE-- Humboldt - Del Norte Counties. (2012). Available at http://cehumboldt.ucdavis.edu/; or call the UCCE Eureka, CA office at: (707) 445-7351.

trees of other species exist underneath them or can be planted. This will facilitate salvage of economic value and allow for brush disposal without necessitating another entry.

- If budget considerations preclude removal of otherwise targeted trees such as those that are intermediate in the canopy hierarchy, consider removal in a subsequent entry. Incremental growth in the interim along with a steady upward trend in firewood values or other value-added opportunities may improve prospects for mitigating costs in the future.

After you've created your shaded fuelbreak, take a final pass through the area. How does it look? Evaluate the completeness of your work. The more thorough the treatment is, the longer it will function without, or with less maintenance.

Shrubland Fuelbreak

Historically, the preferred method to managing fuels in *shrublands* was to use controlled fire on a 5-10 year cycle, limiting the amount of accumulating fuel by repeatedly burning the "brush." Today, it is common to observe large, cleared pathways meandering through these communities serving as a fuelbreak. Removal of surface and ladder fuels, as well as reduction of horizontal continuity of fuels, are the major objectives in reducing fire intensity and *rate of spread* within shrublands.

On residential properties vegetation can be removed in clumps or thinned throughout a selected area. When creating clumps be sure to separate them by a distance of approximately three times the height of the plant, as explained for the Defensible Space Zone above. Identify clumps throughout the area that will be left as wildlife habitat. When thinning in clumps or over entire areas, focus on removing dead plants, trees, and branches before cutting live vegetation. Where present, identify hardwood and/or conifer snags that will be retained as wildlife habitat. If trees are present they should be pruned to reduce the ladder fuels that could carry fire into their canopy. *For more information on pruning, see: Figures V.1-6 and V.1-7 above.)*

When thinning in shrubland areas that are far away from roads, it may be best to deal with slash created during thinning operations by either "lopping and scattering" or by creating burn piles. *(See Section V.1.4 below for an explanation on how to properly burn piles.)*

When thinning next to a road much of the thinned material can either be chipped back onto the site or loaded into a chip truck for removal. When chipping material back onto a site, be sure the chips do not exceed more than several inches in depth. Some of the thinned material can also be lopped and scattered back onto the site for soil stabilization and wildlife habitat *(see Lop and Scatter below).*

Grassland Fuelbreak

The purpose of treating grassland fuels is to lower the flame length and fire intensity in desired locations as well as to restore damaged landscapes. A grassland fuelbreak consists of mowing, burning, or grazing a desired area. Areas adjacent to roads or *ecotone* edges are treated to lower grass height. Grasses can be treated approximately 50-100 feet on each side of roads to create a sufficient fuelbreak. Prior to initiating any fuel reduction within grassland areas it is important to identify native grasses to be retained as future seed sources. Grazing and fire are two potential approaches to treating grassland areas. When using fire as a management tool within grasslands, trees and shrubs should be protected by first reducing the amount of vegetative fuels around their base, which helps protect them from damage caused by direct flame contact.

Upon completion of grassland fuel treatments it is highly recommended to begin the process of sowing native perennial grasses. Work with local resource and restoration professionals, and/or rangeland managers to create a restoration plan that will convert non-native grasslands into native grasslands over time.

V.1.4 What To Do With Thinned Materials

Fuel-reduction projects commonly produce large amounts of cut woody material, especially in Humboldt County where climate and soil combine with historical land management patterns to result in dense-to-very dense forest stands. Dealing with the sheer volume of cut materials is a large and critical part of the restoration equation that has stymied many a do-it-yourself land steward. It is important to have a clear plan on how to treat the slash before beginning work. Failure to do so will undermine success of your project and likely create new problems. The

only current exceptions to this are if prescribed *broadcast burning* alone (without pretreatment) or mastication is the technique used to modify the fuels. Both of these methods dispose of the slash as the essence of the stand modification treatment itself, although broadcast burning alone may require a second application to consume dead fuels created by the first fire.

Continue to think about ways of stacking functions as you move forward with your fuel-reduction projects. One of your first decisions will be whether or not to utilize any of the materials offsite. Options for utilizing materials offsite could include timber sawlogs, firewood, mushroom cultivation logs, biomass for electricity generation, and *biochar (see below).* Onsite utilization choices include erosion control and water infiltration enhancement structures, and spreading materials to decompose in place to enhance soil fertility. Keep in mind that any economic activity involving wood products is regulated by the state through CAL FIRE. If you intend to sell logs that result from your treatment, you may avoid the need for a Timber Harvest Plan by taking advantage of CAL FIRE's Forest Fire Prevention Exemption.[37] In addition to researching the CAL FIRE exemption resources, the Mattole Restoration Council (MRC) has published a helpful summary of exemption requirements.[38]

Regardless of how you decide to utilize materials resulting from fuels reduction, there will always be unutilized material to deal with as well, generally in the category of finer, flashier fuels. Some fuels treatments have focused on removing trees to open the canopy to address crown fire potential. These prescriptions in particular have the potential to increase certain elements of fire hazard unless the finer fuels are also treated.[39] Burning and/or chipping are the most common treatments. In addition, lopping and scattering can be appropriate in some situations. Another possible treatment method gaining attention is woody biomass utilization. All options have their strengths, weaknesses, and tradeoffs. Each method is discussed below.

Burning

Pile burning and broadcast burning are the basic types of this method. *Pile burning* involves collecting and moving brush to one large, or multiple smaller piles, by hand or with machinery. The piles can be burned later, or on an ongoing basis at the time of piling (sometimes called *swamper burning*, since personnel that handle the brush and otherwise assist the sawyers are called "swampers.") Broadcast burning entails applying fire to the surface of an area and "broadcasting" it so that the fire spreads throughout the treatment unit and reaches most if not all of the square footage. *Patch burning* is a form of broadcast burning that applies the fire only to specific patches within the unit. While both basic techniques have their risks to personal and public safety, it must be emphasized that broadcast burning in particular requires a level of training and experience to mitigate hazards that render it an invalid option for the vast majority of private landowners to attempt on a "do-it-yourself" basis. However, professionals both public and private are available to manage and implement this procedure. CAL FIRE offers the Vegetation Management Program[40] (VMP) to assist in this regard.

In any case, all forms of burning are subject to regulation by CAL FIRE and/or the North Coast Unified Air Quality Management District (NCUAQMD), www.ncuaqmd.org/. Be sure to research and implement all legal requirements prior to using any burning treatment method. *(See Section V.4.1 below for more detailed information on local burning regulations.)*

Pros and cons to the types of burning include:

- In some circumstances broadcast burning can be applied as a one-step process without a cutting treatment preceding it.

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[37] The Forest Fire Prevention Exemption Form and the Forest Fire Prevention Exemption Checklist will be useful forms. These forms can be found on line at: CAL FIRE. (2012). *Harvesting Forms.* Retrieved from www.fire.ca.gov/resource_mgt/resource_mgt_forestpractice_harvestingforms.php

[38] Mattole Restoration Council. (2008, November 20). *Fire Hazard Prevention Exemption (AB 2420).* Retrieved from www.mattole.org/content/fire-hazard-prevention-exemption-ab-2420.

[39] Keyes, C.R. & Varner, J.M. (2006). Pitfalls in the silvicultural treatment of canopy fuels. In: *Fire Management Today, 66(3), 46-50.* Retrieved from http://www.fs.fed.us/fire/fmt/fmt_pdfs/F

[40] CAL FIRE. (2009, January). *Vegetation Management Program.* Retrieved from www.fire.ca.gov/communications/downloads/fact_sheets/VegetationManagement.pdf

- Broadcast burning most closely emulates the pattern of disturbance that the ecosystem has evolved with over millennia, incorporating ecological benefits that cannot be replicated otherwise; when applied properly, it leaves nutrients in the ash to leach into the soil with subsequent rainfall.
- Broadcast burning treats surface fuels more thoroughly than other forms of burning.
- Broadcast burning is the riskiest of the burning procedures, takes the most training and experience to implement, and therefore carries the most liability; pre-application preparation and logistics are usually extensive.
- Some effects of broadcast burning may be undesirable to some landowners/managers.
- Pile burning (particularly swamper burning) allows practitioners to fine tune where and how severe the fire effects will be, enabling avoidance of some negative impacts.
- Pile burning can be safely and effectively accomplished in a much wider range of weather and fuel moisture conditions than broadcast burning.
- Pile burning may be accomplished by one knowledgeable and well-equipped person working alone.
- Pile burning can sometimes scorch and/or sterilize the soil below the pile by concentrating burning materials for longer *residence times.*

Caution and conservatism (at the least, if not actual avoidance) should be practiced concerning applying fire in riparian areas. Take care to avoid negative impacts to crucial wildlife habitats.

Chipping

Chipping utilizes machinery to break down woody material into small chips, distributing them into a pile or a truck, or spreading them in a small area near the chipper.

Pros and cons of chipper use include:

- Cost of purchase or rental (some FSCs occasionally organize and offer free chipping or chipping services).
- Cost of operation, including fuel, maintenance, and repairs, plus a suitable vehicle to tow the chipper.
- Necessitates use of fossil fuels.
- Chippers generally do not leave the road, so all brush must be accessible; all brush downhill of the road must be dragged uphill which is usually not the case with burn piles.
- Usually only one or two chippers are available at once, representing an operational bottleneck for brush disposal compared to the possibility of multiple burn piles simultaneously or a broadcast burn.
- Piles or carpets of chips are an unnatural addition to the ecosystem; piles are subject to possibility of spontaneous combustion at a later date.
- Chippers can be dangerous to operate and usually create severe noise.
- Learning to feed chippers safely and effectively is simpler than similar requirements for application of fire, but can still be very dangerous.
- Weather and fuel moisture are usually not a limiting factor.
- Chips can be useful for landscaping, agricultural, and horticultural purposes.
- It is often less labor intensive to prepare brush for chipping vs. pile burning.
- No regulatory processes involved.

Lop and Scatter

In this method, materials are cut into small pieces to maximize ground contact and then distributed evenly on the forest floor and left to decompose. This method guarantees that all nutrients stay on site and contribute to soil fertility gradually, without negatively impacting air quality (assuming no wildfire in the treated area before decomposition is complete). It can also provide short-term habitat for some wildlife species. Access is usually not a limiting factor, and this method is generally not subject to regulation (except as part of a commercial timber harvest or cost-share subsidy).

Disadvantages include:

- Seasoned fuels remain viable until decomposed (this can take up to 12 or more years depending on the situation). This increases certain elements of fire hazard during that period. Therefore, this method is usually not suitable in defensible space zones.
- Often very labor intensive for sawyers, who usually command significantly higher wages than swampers.
- Significant volumes of green material created during spring-growth season can invite insect infestation.

Mastication

Various types of machinery are available that can travel through a stand and transform trees and brush into chips. This strategy can be very cost effective in certain situations. Disadvantages include:

- Possible widespread soil compaction.
- Inability to do fine work, especially in tight quarters (possibly resulting in mechanical damage to leave trees).
- Possible inaccessibility on steeper slopes.
- Compacted mats of chips throughout the treatment area may be relatively slow to decompose.

Biomass

This method involves gathering the slash and byproducts left over from fuel reduction and timber harvest projects and converting them into energy stocks, such as wood pellets, wood chips, *biochar*,[41] and liquid biofuels. *Biomass utilization* as a method for utilizing the byproducts of community-level fuel reduction is somewhat up and coming in Humboldt County, with many promising prospects as well as challenges.

Pros and cons for biomass utilization include:

- Biomass utilization can generate products for a wide variety of purposes, including fuel-heat systems, fuel for power plants, pulp and panel board, pulp chips for paper products, lumber and roundwood, firewood, landscape amendments, soil additives for mulching and compost, and animal bedding.
- The ability to produce particular products depends on the quality of the biomass, which can be unreliable when originating from fuel reduction projects.
- Biomass is considered a “carbon neutral” fuel source; the trees comprising woody biomass have absorbed carbon from the atmosphere equal to the amount released when the fuel is burned.
- Technologies for biomass utilization are still developing and cost can be a limiting factor for those seeking to employ this method.
- Community fuel reduction projects are sporadic and will vary in the amounts of woody debris they produce. Therefore, finding a reliable supply of fuel stocks can be challenging in generating a worthwhile cost-benefit analysis.
- Transportation of woody debris for biomass utilization can be a financial consideration. However, for small-scale projects, transportation can be managed using simple equipment and all-terrain vehicles.
- There are currently three biomass power plants in Humboldt County: Blue Lake Power, DG Fairhaven Power, and the Greenleaf Power Plant a located in the town of Scotia.

[41] Biochar is organic matter that is burned slowly with limited oxygen until it becomes charcoal, which is then used as a soil amendment.

V.2. Ready, Set, Go!

"Ready, Set, Go" is the statewide public education approach to prepare California residents for wildfire. It is explained and detailed here for Humboldt County residents.

V.2.1 Ready: What to Do Before Wildfire

Being "ready" means preparing your home and property to survive wildfire. As explained in the first section, "From the House Out," that means hardening your home and creating a fire-safe landscape to best survive wildfire. It also means ensuring that your home is a safe place for firefighters when they arrive to help protect it during a wildfire. If you are truly ready, then chances are good that you and your home will survive. If you are not ready, your home may be one of those lost in your neighborhood. **Your actions can make a significant difference in your odds of surviving the next wildfire intact.** As explained in the previous chapter,

> "Being Ready for wildfire starts with maintaining an adequate Defensible Space and by hardening your home by using fire resistant building materials… It takes the combination of both Defensible Space and the hardening of your home to really give your house the best chance of surviving a wildfire."[42]

You can download the CAL FIRE "Ready For Wildfire" brochure at:
www.readyforwildfire.org/docs/files/File/brochures2012/calfire_ready_brochure_LINOweb.pdf

As the quote below illustrates, lack of preparation can result in the least desirable outcome:

> "The WUI[43] fire disaster context can be generally described as a set of contingencies. The disaster sequence starts when a wildfire or multiple wildfires burn during extreme fire conditions. The combination of vegetation, weather conditions, and topography produces fast-spreading, intensely burning fire behavior that overwhelms suppression efforts. If the extreme wildfire spreads close enough to residential development with its flames and firebrands (lofted burning embers), hundreds of ignitable homes can be simultaneously exposed. Although protection may be effective for some homes, an extreme wildfire's high intensities and high rate of area growth (rapid spread and spot ignitions) ignites too many houses and threatens firefighters' safety, preventing them from protecting all structures. With homeowners likely evacuated and firefighters unable to protect every house, initially small, easy-to-extinguish ignitions can result in total home destruction."[44]

The best defense under this conflagration scenario is to ensure that your home, property, and family are all thoroughly prepared for wildfire, as described throughout this section.

Help Firefighters Help You

Work with your local fire station staff and volunteers well before fire season to acquaint them with your property. Rural residents should create a map of your property that illustrates the locations of the most valuable structures and other resources. Mark on your map the location of your water sources, septic system, where your gas/propane/diesel tanks and shut-offs are located, and any other highly flammable or explosive materials. Include locations of any locked gates and the combinations to those gates or locations of keys. Be sure to include locations of any pets or livestock. Put your name, phone number (and/or cell number), street address, and parcel number or *Global Positioning System* (GPS) coordinates on this map. Put a copy on the wall by a phone, with the number of your local fire department, so you can use it in case of an emergency. When a fire is imminent, place this information in an envelope clearly marked for firefighters and leave it out in a visible place just before evacuating. Invite local firefighters out to your property (long before fire season) to review this and show them where everything is. This will help them effectively protect your property when wildfire occurs.

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[42] CAL FIRE, Ready for Wildfire. (2012). *Being Ready*. Retrieved from www.readyforwildfire.org/being_ready

[43] WUI = Wildland Urban Interface

[44] Cohen, J.D. (2008). The wildland-urban interface problem–A consequence of the fire exclusion paradigm. (p.22).

If you have any experience or training in fighting fire, create a firefighting tool area that is easily accessible. Keep this in a non-flammable structure, such as a metal shed or garage. Your collection should include tools like shovels, hoes, Pulaskis, and McLeods. Keep a set of firefighting clothes there as well, including heavy cotton or wool clothing, leather boots, eye protection, and gloves. Put a fire hose at your water source and mark it well so you, your neighbors, and/or firefighters can easily find and use it. Remember, you should only attempt to fight a fire if you have legitimate experience, and if the fire is small, such as from ember ignitions. Never attempt to fight a wind-driven fire. Under those circumstances, the best option is to prepare your home and evacuate early.

Water Storage and Supply

The amount of water you have stored at your homesite could have a significant impact on the ease (or difficulty) of successfully fighting a fire there. For those not on a community or public water system, 2,500 gallons of water storage for firefighting is the minimum required for new construction on SRA lands in California. In Humboldt County, 2,500 gallons of water storage is also required in the SRA for the development of new parcels and for new construction and additions built with an alternative owner builders (AOB) permit per the County Modified Limited Density Owner Built Rural Dwelling Regulations.[45]

Storing water in the winter for use in the summer and fall, and conserving water are both critical in our environment. (Where freeze protection is required by the County, such measures should be provided.) There are many options available in terms of water tanks. Ideally, you should have a dedicated firefighting water tank, with a fire-ready standpipe, and a separate tank for domestic use, (*see the diagram in Figure V.2-1. Developing Rural Residential Water Supplies for Fire Protection*). If you cannot do this, position your domestic water line to emerge out of your water tank in the middle of the tank, so you don't accidentally drain your entire tank into the garden or elsewhere. This ensures that the bottom half is maintained for emergency use. Combined water storage is allowed as long as the minimum required gallons for fire department use (2,500 gallons) are always maintained. Typically, this requires plumbing the domestic water flow line above the minimum water storage requirements mark of your tank. *For County regulations and guidance on developing emergency water supply, please see Appendix I: Emergency Water Supply Systems.*

Your fire water line should be three inches in diameter. It is recommended that water lines be buried 12 inches underground in order to prevent degradation of the piping materials from sunlight corrosion, fire damage, freezing, and other types of exposure. Although an aboveground plastic water line will likely burn in a fire, a full plastic water tank probably will not. Put a metal standpipe (hydrant) or fire valve at the end of the water line with a 2½-inch "national hose male fire hose threaded adapter" (National Hose Thread). This is so firefighters can quickly attach to your water source. Fire hose thread is known as national thread, national standard, NST, NSFH, NH, or FHT. For County standards, please refer to Fire Safe Regulations, Chapter 4. Emergency Water Standards, http://co.humboldt.ca.us/planning/planning_library/fire_regs/firesafe.pdf.

Your water tank can be located most anywhere on your property, but generally near a road, not too close to your house, and ideally at an elevation equal to or higher than the base elevation of the house. Tanks of 5,000 gallons or greater require a building permit issued by the Humboldt County Building Division. *See Figure V.2-1 below, or CAL FIRE's Emergency Water Supply Systems in Appendix I for guidance and illustrations on how to properly locate your fire protection water supply system on your property.*

To ensure that firefighters can use your water to protect your home, the fire department connection (hydrant) must be located no closer than four feet and no further than 12 feet from the road edge; and no closer than 50 feet nor further than ½ mile from the structure.

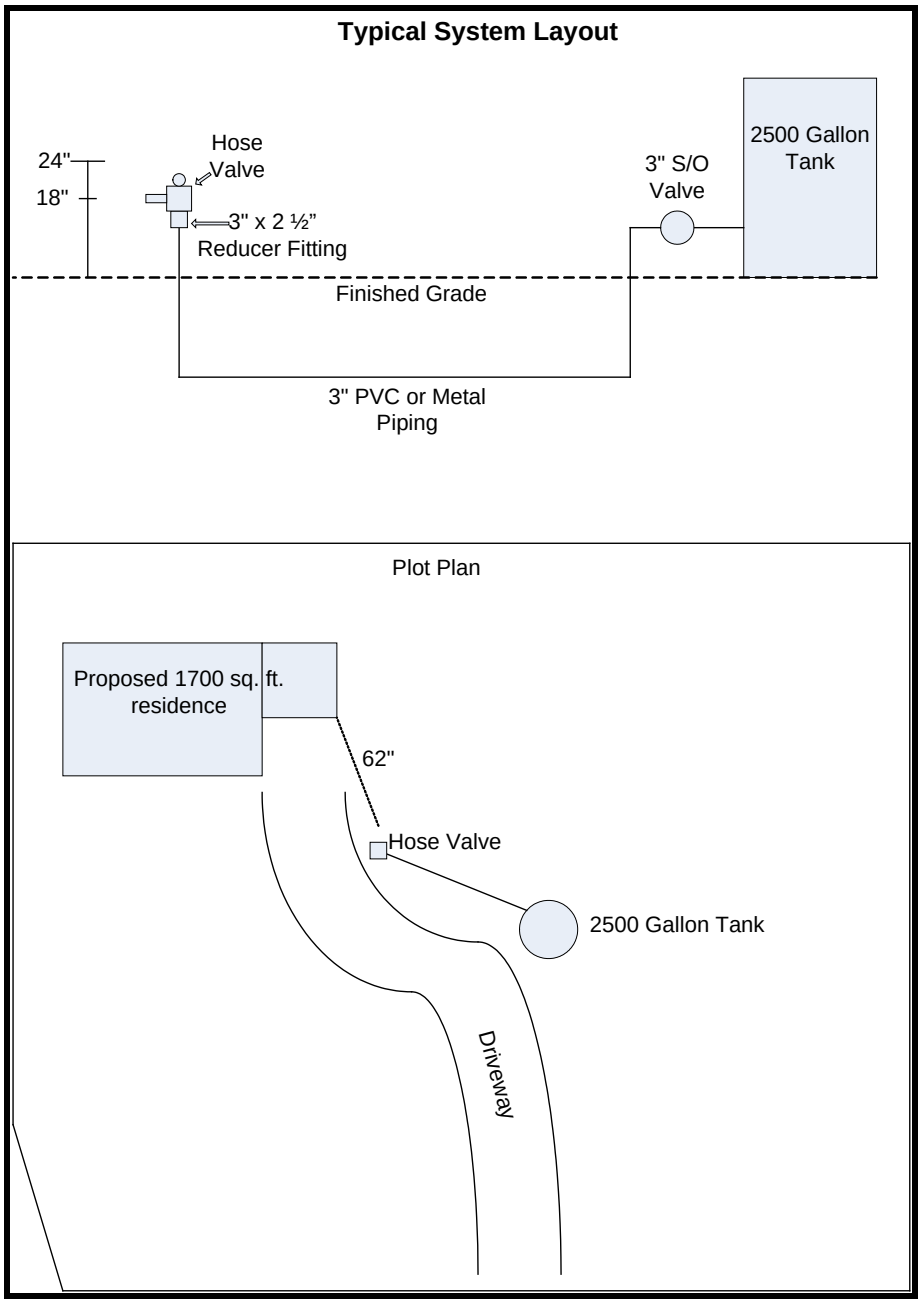
> "The hydrant or fire valve shall be 18 inches above grade, eight (8) feet from flammable vegetation, no closer than four (4) feet nor farther than 12 feet from a roadway, and in a location where fire apparatus using it will not block the roadway."[46]

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[45] *Information about the Alternative Owner Builder Ordinance can be found at:* County of Humboldt, Planning and Building Department. (n.d.). *Alternative Owner Builder (AOB) Ordinance.* Building Inspection Division. Retrieved from www.co.humboldt.ca.us/planning/building/#forms.

[46] *See Appendix F, or:* County of Humboldt, Planning and Building Department. (n.d.). *Fire Safe Regulations.*

Figure V.2-1. Developing Rural Residential Water Supplies for Fire Protection[47]



Make sure that your standpipe (hydrant) is somewhere visible, kept clear of flammable vegetation out to three feet, and positioned where a fire truck can access it and turn around to leave. The following County regulation applies to the signage of water sources:

> "If located along a driveway, except where the residence is served with an individual water supply, a wooden sign with a minimum 3 inch letter height, 3/8 inch stroke, contrasting with the background color of the sign, with the wording "FIRE WATER" mounted on a wooden post or … if located along a street or road, (1) a reflectorized blue marker, with a minimum dimension of 3 inches, shall be mounted on a fire retardant post. The sign post shall be within 3 feet of said hydrant/fire

[47] Diagram based on Humboldt County Fire-Safe Regulations; obtained from: Humboldt #1 Fire Protection District, personal communication, November 25, 2012.

> valve, with the sign no less than 3 feet nor greater than 5 feet above the ground, in a horizontal position and visible from the roadway, or (2) as specified in the State Fire Marshall's Guidelines for Hydrant Markings Along State Highways and Freeways, May 1988."[48]

If firefighters don't know where the water connection is or if it is not accessible, it is not going to be very useful. Hence, make sure your local firefighters know exactly where your tank is located, well before any fires. Homes have been lost because firefighters could not find a nearby, but hidden water tank. The roadway must also be wide enough to accommodate the fire apparatus without blocking it. *(See "Roads and Access" section below.)*

In an emergency, swimming pools and ponds provide a great source of *fire protection water*. Firefighters can *draft* directly from these sources if they can get close to them. **Indicating the existence of ponds and swimming pools that may be drafted for fire protection water by posting blue reflective dots along driveways is recommended to help alert firefighters to their availability.** If you are going to depend on this water as your first response to a fire, you will need a pump and a generator for backup, or a gas engine pump. Remember that when there is a *large fire* the power will likely go out; therefore, the generator is needed to pump water from your pool or pond if your pump requires electricity. *For more information, see the Mendocino County Fire Safe Council's pamphlet, Developing Water Supplies for Fire Protection.*[49]

Options are expanding for inexpensively storing water. Cisterns (catchment to collect rainwater) are becoming increasingly popular. Several websites describe how to make these. Low-cost water tanks are also available. The easily transported Pioneer Tanks from Australia are now seen throughout Humboldt County (www.pioneertanks.com.au).

Roads and Access

Roads are critical components in the fire equation. They can be a great place for a fuelbreak for firefighters to fight a fire. They are also vital for evacuation and for firefighters to access your home. Fire engines generally need a minimum clearance of 20 feet wide by 15 feet high. Humboldt County regulations require *turn-arounds* on driveways and dead-end roads to provide enough space for fire engines to turn around. The minimum turning radius required for a turn-around is 40 feet from the center line of the road. If a hammerhead "T" is used, the top of the "T" shall be a minimum of 60 feet in length. *For more information on County road standards, see the County Fire Safe Regulations, Chapter 2, Emergency Access.*[50]

Fuel reduction treatments along roadways improve safety during emergency evacuations and help ensure access for firefighting apparatuses. A common shaded fuelbreak prescription along roadways is 50 feet on each side of the road. This can vary depending on slope and density of vegetation. You also need plenty of places on the road where vehicles can pass each other, i.e., adequate *turn-outs* properly designed and spaced along your access road or driveway. If a wildfire is threatening and a fire engine is trying to get to your home or business while you're trying to evacuate, there need to be areas in the road wide enough to accommodate traffic safely from both directions.

Remember, when a wildfire is near, chances are it will be very dark and smoky, thus very disorienting. Take the time now to get to know your evacuation routes, to make it easier on yourself later, and so you are prepared if and when a wildfire comes.

Most firefighters will not and should not unnecessarily risk their equipment or lives to protect your property. Firefighters will almost always turn their vehicles around immediately when they arrive to a fire, for safer and quicker escape. This is good advice for you too. Get in the habit of parking your vehicle(s) facing out at home so you can leave quickly if necessary. You should always do this if there is a wildfire, or the potential for one, anywhere near you.

If you have locked gates, they will likely be cut by firefighters. If you don't want that to happen, make sure you leave them unlocked. Another option is to install a *Knox Box* and make sure you local fire department can access it. A

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[48] *See Appendix F, or:* County of Humboldt, Planning and Building Department. (n.d.). *Fire Safe Regulations.*

[49] Mendocino County Fire Safe Council. (2011). *Water Supplies for Fire Protection.* Publications and Information. Retrieved from http://firesafemendocino.org/pdf/Water%20Supplies%20for%20Fire%20Protection%204%20pages.pdf.

[50] *See Appendix F, or:* County of Humboldt, Planning and Building Department. (n.d.). *Fire Safe Regulations.*

Knox Box is a secure key box system accessible only by fire personnel during emergencies requiring immediate access to a facility. The system eliminates the need to use forcible entry techniques resulting in costly damage to the facility. If you have electric gates, make sure they have a back-up power source or other way to open when the power is out, which is likely during a large wildfire.

Bridges also need to be evaluated for safe fire truck passage as per the County Fire Safe Regulations *(see Appendix F)*. Weight limits must always be posted on private bridges. Generally, if a propane (or other fuel) truck or water truck can make it across the bridge, then a fire truck can. If you have a bridge that will not safely carry a fire engine, you must contact your local fire department and let them know. Don't make their job any more dangerous than it already is. Instead, help them to help you.

Finally, many private dirt roads can become impassable, especially to large and/or heavily laden fire engines after a rough winter. A heavily potholed, washboarded, or otherwise severely degraded driving surface will at minimum drastically slow *response times* if not preclude response whatsoever. Making sure your road has proper surfacing and drainage is an important long-term investment. If applied properly and driven on reasonably, maintenance inputs are minimized regardless of relative weather severity, and could make the difference between saving and losing a home (or a life during other emergency response situations). Each individual engine captain will decide site-specifically if a road surface is acceptable; they will not risk a broken axle, which could endanger the crew. A simple rule of thumb here is that the smoother the surface is maintained, the quicker the response time will be. .

Maintaining your dirt and gravel road is important for many reasons, including keeping *sediment* out of streams and ensuring safe evacuation in an emergency. If several households share the same road, consider rotating the responsibility for coordinating road maintenance every few years. The identified coordinator can collect an agreed-upon annual assessment from all those who regularly use the road, and organize the maintenance. For information on how to maintain private roads, see *Rural Roads: A Construction and Maintenance Guide for California Landowners,*[51]and *Handbook for Forest and Ranch Roads.*[52]

Fuel Treatments along Roads and Driveways

Fuel treatments along driveways and roads are a high priority. While ecological concerns regarding vegetation types are considered, fuel reduction remains the primary management objective in these areas. The main objective for *ingress-egress* corridors is to create a defensible perimeter along and adjacent to all roads and driveways. These access routes are also where a fire would decrease in intensity and provide safer access for firefighters.

Roads can be a potential *ignition source* for wildfires (from vehicles and people). When treated, they serve important functions as fuelbreaks, as well as *anchor points* for tactical fire-suppression activities. Thus, treatment of these areas is a top priority in any *fuel management* strategy. Treatments along driveways and road corridors benefit multiple landowners in the event of a wildfire, thus providing an opportunity for community planning and collaboration.

Roads and Driveways Best Management Practices

- Retain larger trees while aggressively thinning understory vegetation in 100-ft. area from roads or driveways.
- *High-prune* all branches that are hanging over the road to a height of at least 15 feet above the ground, especially any highly flammable vegetation such as eucalyptus and other flammable *exotic species*.
- Remove all dead and dying vegetation; separate fuel continuity and clear back all flammable vegetation along driveways and roads, for up to 10 feet on either side. Focus treatments first on critical evacuation routes.
- Identify at least two exit routes from your neighborhood.
- Post clearly visible road signs to show traffic restrictions such as dead-end roads and height and weight limits.

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[51] Kocher, S.D., Gerstein, J.M., & Harris, R.R., (2007). *Rural Roads*: A *Construction* and *Maintenance Guide* for *California Landowners*. UCANR Publication 8262. Retrieved from http://cecentralsierra.ucanr.edu/files/88233.pdf

[52] Weaver, W.E. & Hagans, D.K. (1994, June). Handbook for forest and ranch roads: A guide for planning, designing, constructing, reconstruction, maintaining and closing wildland roads. Mendocino County Resource Conservation District. Retrieved from http://www.krisweb.com/biblio/gen_mcrcd_weaveretal_1994_handbook.pdf.

- Construct roads that allow two-way traffic.
- Design road width, grade, and curves to allow access for large emergency vehicles.
- Ensure that parking restrictions are followed, thereby keeping roadways clear of obstructions.
- Keep roads clear of impediments such as trash cans.
- Ensure that fences, hedges, and other impediments are well clear of the road right-of-away, to ensure safe passage and off-street parking.
- Design bridges to carry heavy emergency vehicles. Post weight limits on all private bridges.
- Make sure that dead-end roads and long driveways have turn-around areas wide enough for emergency vehicles.
- Construct and/or ensure turnouts along one-way roads.
- Make sure that street names and numbers are visibly posted at each intersection.
- Post your house address on the street fronting the property.
- If your house is not visible from the street, post a sign next to the vehicle entrance using a minimum of 4-inch address numbers on a visible, elevated post. Use noncombustible materials with a contrasting background. *(See below for more information on signage and addressing.)*

Signage and Addressing

Chances are firefighters are not going to know where you live, especially in the case of a large fire where out-of-town firefighters are present. Make sure you have visible road and address signs. This is not only common sense—it is legally required. If you have a visible address sign on your house and/or driveway, and a road sign at the street, emergency service personnel (fire, ambulance, police) will likely find it. If not, your home may not be defended from wildfire. This is also crucial when emergency vehicles such as ambulances are trying to find you in the case of a medical emergency, where a few minutes can be the difference between life and death. Work with your local fire department if you have questions regarding how to do this most effectively. If you want emergency personnel to be able to find you, do your part.

Your address sign should be of reflective material so it is visible at night, and non-flammable (metal on metal post). The letters must be at least 3 inches high and 3/8 reflective stroke,[53] and of a contrasting color to the sign's background.[54] Where the structure is not visible from the roadway, they need to be on an elevated post and visible from both directions.

V.2.2 Set: Being Prepared for Wildfire's Approach

Fire can be extremely frightening. As stated throughout this document, taking steps now to prepare you, your family, and your home will make it easier to survive a wildfire crisis. It may also help you reduce panic and effectively address the situation. Even the most organized of us will forget something when a crisis arrives. Create easy-to-follow checklists based on those in this section for your family to use in an emergency. CAL FIRE has developed a set of such checklists on their Ready, Set, Go website (www.readyforwildfire.org). You can download the SET brochure at www.readyforwildfire.org/docs/files/CALFIRE_Set_Brochure.pdf.

> "Before wildfire strikes, it is important that you get Set. Prepare yourself and your home for the possibility of having to evacuate (www.readyforwildfire.org/evacuation_steps). The following three main preparation actions should be completed and familiar to all members of your household long in advance of a wildfire.
>
> ➔ Create a **Wildfire Action Plan** (www.readyforwildfire.org/wildfire_action_plan) that includes evacuation planning for your home, family, and pets.
>
> ➔ Assemble an **Emergency Supply Kit** (www.readyforwildfire.org/emergency_supply_kit) for each person in your household.

[53] Meaning that the characters need to be at least 3/8-inch thick.

[54] *See Appendix F, or:* County of Humboldt, Planning and Building Department. (n.d.). *Fire Safe Regulations.*.

➔ Fill-out a **Family Communication Plan** (www.readyforwildfire.org/family_communication_plan) that includes important evacuation and contact information."[55]

Create a Wildfire Action Plan[56]

Your Wildfire Action Plan must be prepared and familiar to all members of your household well in advance of a wildfire. Use the checklist below to help create your plan. Each family's plan will be different, depending on a variety of issues, needs, and situations. **We have included many checklists in this document (indicated with the dashed-line border, that you can copy and cut out to use to prepare you and your family for the eventuality of wildfire.**

Your Wildfire Action Plan Checklist

Create an **evacuation plan** that includes:

- ☐ A designated emergency meeting location outside the fire or hazard area. This is critical to determine who has safely evacuated from the affected area.
- ☐ Several different escape routes from your home and community. Practice these often so everyone in your family is familiar in case of emergency.
- ☐ Have an evacuation plan for pets and large animals such as horses and other livestock.
- ☐ Create a Family Communication Plan *(see below)* that designates an out-of-area friend or relative as a point of contact to act as a single source of communication among family members in case of separation. (It is easier to call or message one person and let them contact others than to try and call everyone when phone, cell, and internet systems can be overloaded or limited during a disaster.)

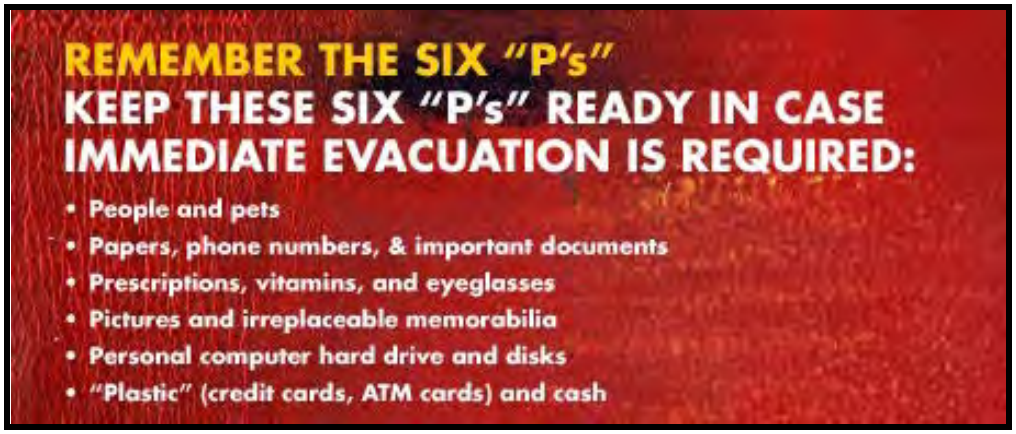
Be Prepared:

- Have fire extinguishers on hand and train your family how to use them, (check expiration dates regularly).
- Ensure that your family knows where your gas, electric, and water main shut-off controls are located and how to safely shut them down in an emergency.
- Assemble an Emergency Supply Kit for each person, as recommended by the American Red Cross. *(See below for details.)*
- Maintain a list of emergency contact numbers posted near your phone and in your emergency supply kit.
- Keep an extra Emergency Supply Kit in your car in case you cannot get to your home because of fire or other emergency.
- Have a portable radio or scanner so you can stay updated on the fire.
- Tell your neighbors about Ready, Set, Go! and your Wildfire Action Plan.

[55] CAL FIRE, Ready for Wildfire. (2012). *Family Communication Plan.* Retrieved from http://www.readyforwildfire.org/family_communication_plan

[56] CAL FIRE, Ready for Wildfire. (2012). *Create a Wildfire Action Plan.* Retrieved from www.readyforwildfire.org/wildfire_action_plan

Figure V.2-2. The Six P's for Evacuation



Assemble an Emergency Supply Kit[57]

Put together your emergency supply kit long before a wildfire or other disaster occurs, and keep it easily accessible so you can take it with you when you have to evacuate. Plan to be away from your home for an extended period of time. Each person should have a readily accessible emergency supply kit. Backpacks work great for storing these items (except for food and water) and are quick to grab. Storing food and water in a tub or chest on wheels will make it easier to transport. Keep it light enough to be able to lift it into your car.

Emergency Supply Kit Checklist

- ☐ Three-day supply of non-perishable food and three gallons of water per person
- ☐ Map marked with at least two evacuation routes
- ☐ Prescriptions or special medications
- ☐ Change of clothing
- ☐ Extra eyeglasses or contact lenses
- ☐ An extra set of car keys, credit cards, cash or traveler's checks
- ☐ First aid kit
- ☐ Flashlight
- ☐ Battery-powered radio and extra batteries
- ☐ Sanitation supplies
- ☐ Copies of important documents (birth certificates, passports, etc.)
- ☐ Don't forget pet food and water!
- ☐ Items to take if time allows:
    - o Easily carried valuables
    - o Family photos and other irreplaceable items
    - o Personal computer information on hard drives and disks
- ☐ Chargers for cell phones, laptops, etc. (especially car chargers)
- ☐ Always keep a sturdy pair of shoes and a flashlight near your bed and handy in case of a sudden evacuation at night.

For more information on emergency supplies, visit www.Ready.gov.

[57] CAL FIRE, Ready for Wildfire. (2012). *Assemble an Emergency Supply Kit.* Retrieved from www.readyforwildfire.org/emergency_supply_kit

Family Communication Plan[58]

Download and fill out the Family Communication Plan (www.readyforwildfire.org/docs/files/File/commplan.pdf, or copy it from Figure V.2-3 on the following page. Place it near your telephone, where it can easily be found by everyone in your household. Copy the form and keep it in each of your Emergency Supply Kits. This will allow all family members to have access to this key information in case you get separated.

Figure V.2-3. Family Communication Plan (next page)

[58] CAL FIRE, Ready for Wildfire. (2012). *Family Communication Plan.*

SAVE THIS
FAMILY COMMUNICATION PLAN

Fill out this form and place it near your telephone where it can easily be found by everyone in your household. Copy the form and keep it in your Emergency Supply Kits. This will allow all family members to have access to this key information in case you get separated.

WHEN WE HAVE TO EVACUATE, WE WILL MEET AT:

_____

OUR OUT-OF-AREA EMERGENCY CONTACT PERSON IS:

Name: _____ Relationship: _____

Home Phone #: _____ Cell Phone #: _____

E-mail: _____

OTHER IMPORTANT NUMBERS ARE:

Emergency 911: _____ Local Police: _____

Local Fire Department: _____ Other: _____

Other: _____ Other: _____

OUR TWO EVACUATION ROUTES ARE (SKETCH ROUTES BELOW):

Mass Notification Systems

There are mass notification programs for residents in various parts of California. This is a service provided by local governments to call residents in the case of an emergency in their community. The County of Humboldt has an operable reverse calling notification system available for use during emergency events. However, the system does not include access to all area telephone numbers. The system only includes listed numbers by AT&T and Frontier, which are updated monthly. There is currently no process whereby individual telephone numbers can be input into the system by the public. For additional emergency preparedness information please see the Humboldt County Sherriff's Office: Office of Emergency Services."[59]

There are also commercial services in place for organizations, businesses, and other groups of people to create automated phone calling in a short time frame. One service is called One Call Now, www.onecallnow.com/Default.aspx; another is Call-Em-All, www.callemall.com. These are potential community notification options for homeowner's associations, schools, and other neighborhood groups.

V.2.3 Go: What to Do During Wildfire—Evacuating Safely[60]

Give your household the best chance of surviving a wildfire by being ready to go and evacuating early. Evacuating early means you help firefighters by keeping roads clear of congestion, enabling them to move more freely to do their job. This includes going through **pre-evacuation preparation steps** (only if time allows) to increase your home's defenses, as well as creating a **Wildfire Action Plan** for your family. *(See V.2.1. Ready: What to Do Before Wildfire, and V.2.2. Set: Being Prepared for Wildfire's Approach, above for more information.)* Being ready to go also means knowing when to evacuate and what to do if you become trapped.

CAL FIRE: Says GO!

Remember: When immediate evacuation is necessary, follow these steps as soon as possible to get ready to GO!

- Review your **Evacuation Plan Checklist**
- Ensure your **Emergency Supply Kit** is in your vehicle.
- Cover up, to protect against heat and flying embers. Wear long pants, long sleeve shirt, heavy shoes/boots, cap, dry bandanna for face cover, goggles, or glasses. 100% cotton is preferable.
- Locate your pets and take them with you.

Pre-Evacuation

As stated above, to ensure that your family is prepared to evacuate, begin by walking around your property while looking for anything removable outside your home that could ignite or burn. This includes lawn furniture, door mats, hanging plants, etc. Move all of these into your garage, shed, or other enclosed space (including your house), or 30–50 feet away from your home. You want to ensure that these do not ignite and spread fire to your home.

IF A FIRE STARTS IN YOUR NEIGHBORHOOD, REMEMBER TO CALL 9-1-1. In the midst of the excitement and panic of a fire, and attempts to extinguish it, it is possible to forget to call 9-1-1 to alert firefighters. Do not call the office/station phone numbers of the firefighting services. Instead 9-1-1 is the number to report a fire; every second counts in fighting a fire. Should the time come that you do have to call 9-1-1, give them your address (which must be visibly marked on the road so firefighters can find your home) or GPS coordinates if you have them (especially if you live in an area where addresses are confusing). If you live in a remote area, tell the dispatcher the name of your local fire department (which you should be sure to know).

[59] County of Humboldt, Office of Emergency Services. (2003). Retrieved from http://www.co.humboldt.ca.us/sheriff/oes/

[60] CAL FIRE, Ready for Wildfire. (2012). *Go! Evacuation Guide.* Retrieved from http://www.readyforwildfire.org/go

If you live in a remote area and a fire has started on your property, and conditions are safe for you to leave your house, after you call 9-1-1 go to the beginning of your road and either post a person there or put up a non-flammable flag or some other sign to let firefighters know where the emergency is and the way to your house. The easier you can make it for the firefighters, the greater your chance of surviving a fire.

CAL FIRE Pre-Evacuation Preparation Steps

When an evacuation is anticipated, follow these checklists (if time allows) to give your home the best chance of surviving a wildfire:

Inside the House

- ☐ Shut all windows and doors, leaving them unlocked.
- ☐ Remove flammable window shades, curtains and close metal shutters.
- ☐ Remove lightweight curtains.
- ☐ Move flammable furniture to the center of the room, away from windows and doors.
- ☐ Shut off gas at the meter. Turn off pilot lights.
- ☐ Leave your lights on so firefighters can see your house under smoky conditions.
- ☐ Shut off the air conditioning.

Outside

- ☐ Gather up flammable items from the exterior of the house and bring them inside (patio furniture, children's toys, door mats, trash cans, etc.) or place them in your pool.
- ☐ Turn off propane tanks.
- ☐ Move propane BBQ appliances away from structures.
- ☐ Connect garden hoses to outside water valves or spigots for use by firefighters. Fill water buckets and place them around the house.
- ☐ Don't leave sprinklers on or water running, they can affect critical water pressure.
- ☐ Leave exterior lights on so your home is visible to firefighters in the smoke or darkness of night.
- ☐ Put your Emergency Supply Kit in your vehicle.
- ☐ Back your car into the driveway with vehicle loaded and all doors and windows closed. Carry your car keys with you.
- ☐ Have a ladder (preferably not wooden) available and place it at the corner of the house for firefighters to quickly access your roof.
- ☐ Seal attic and ground vents with pre-cut plywood or commercial seals.
- ☐ Patrol your property and monitor the fire situation. Don't wait for an evacuation order if you feel threatened.
- ☐ Check on neighbors and make sure they are preparing to leave.

Animals

- ☐ Locate your pets and keep them nearby.
- ☐ Prepare farm animals for transport and think about moving them to a safe location early.

For more information, see www.readyforwildfire.org/pre-evacuation_preparation.

What to Do When Wildfire is Imminent

- ☐ Back your car in the garage heading out with windows closed and keys in the ignition.
- ☐ Close the garage door, leave it unlocked, and disconnect the automatic door opener (if applicable) in the case of power failure.
- ☐ Keep a flashlight and portable radio with you at all times, and stay tuned to your local news station.
- ☐ Move combustible yard furniture and other flammable items away from the house or store them inside.
- ☐ Cover windows, attic openings, eaves, and vents with fire-resistant materials such as ½-inch or thicker plywood. Close window shutters and blinds if they are fire-resistant.
- ☐ Attach garden hoses to spigots and place them so that they can reach all areas of your house.
- ☐ Fill all sinks, bathtubs, trash cans, buckets, and other containers with water. Keep small rags or wet towels handy to dip into the water and extinguish spot fires.
- ☐ If you have an emergency generator or a portable gasoline-powered pump that will supply water from a swimming pool, pond, well, or tank, clearly mark its location and be ready to operate it.
- ☐ Place a metal (preferably not wooden) ladder against the house on the opposite side of the approaching fire for access to the roof.
- ☐ Close all windows and doors (including securely closing pet doors) around your home to prevent sparks from blowing inside.
- ☐ Close all doors within the house to slow fire spread inside.
- ☐ Turn on the lights in all rooms of your house, on the porch, and in the yard. Your house will be more visible through the smoke or darkness.
- ☐ Shut off butane/propane, diesel, or natural gas valves.
- ☐ Move furniture away from windows and sliding glass doors to keep them from igniting from the radiant heat of the fire.
- ☐ Keep everything possible off roadways, including cars, garbage cans, trailers, etc.
- ☐ If you are relying on a cordless telephone, be sure you have a backup non-electric phone.
- ☐ If you have a cellular phone, be sure you have your car charger available so you can charge it from your car battery. Purchase a 12-volt “cigarette-lighter” inverter so you can charge critical items from your vehicle. Put both of these into your car so you can charge your phone and laptop. If you have an Internet air card (cellular USB modem), add that to your car emergency communication kit. Internet may be your easiest communication avenue at first, especially for reaching family members outside the immediate area.
- ☐ Conserve your water. Save it for when the fire is at your house, or the fire has passed. This is when you may need it to put out any smoldering embers or sparks. Remember that if the power goes out and you use a system with a pump, you won’t have water unless you have a backup generator. Fill bathtubs and any available containers to store water as soon as possible, ahead of any potential power outage.
- ☐ Be sure to keep your "water reservoirs" and portable tanks filled, and have mops and hoses stored with the rest of your emergency supplies (ladders, shovels, etc.).
- ☐ Finally, ensure that all backup generators have an approved crossover switch, installed by a licensed electrician, so when the power company is fixing downed lines, you don’t harm or kill a lineman with your generator.

Evacuation

Be ready if you need to evacuate. Have everything you need packed beforehand (including your cellular phone car charger). Some residents in high fire-risk areas move their valuables to a safer location during extreme fire weather. Identify all alternate evacuation routes and drive them now so you know them well. Do this in the dark too so you will

be comfortable during a large fire, where visibility can be very low. Know at least two ways out. Make sure you are comfortable with both routes. Have keys or combinations to locked gates in your vehicle. Turn on your headlights, and drive SLOWLY and carefully. There could be many people trying to leave and/or firefighters and other emergency service personnel trying to enter.

During wildfire events that have the potential to threaten personal safety, community evacuation sites may be established where residents can go to survive a wildfire. Evacuation sites will be established in different locations depending on the anticipated path of the wildfire[61]. The determination for the location of these sites is normally made by Humboldt County Emergency Operations Center Incident Commander in cooperation with an Incident Management Team. The Humboldt County Sheriffs and Emergency Officials will use mass communication and door-to-door methods to inform residents about the threat and where residents should go to take shelter.

See CAL FIRE's evacuation information in Appendix J.

When to Evacuate

- ☐ Leave as soon as evacuation is recommended by fire officials to avoid being caught in fire, smoke or road congestion. Don't wait to be ordered by authorities to leave. Evacuating early also helps firefighters keep roads clear of congestion, and lets them move more freely to do their job. In an intense wildfire, they will not have time to knock on every door. If you are advised to leave, don't hesitate!
- ☐ Officials will determine the areas to be evacuated and escape routes to use depending upon the fire's location, behavior, winds, terrain, etc.
- ☐ The Humboldt County Sheriff's Office is responsible for implementing evacuation procedures and enforcing evacuation orders. Follow their directions promptly.
- ☐ You will be advised of potential evacuations as early as possible. You must take the initiative to stay informed and aware. Listen to your local radio and TV stations for announcements from law enforcement and emergency personnel.
- ☐ You may be directed to temporary assembly areas to await transfer to a safe location.
- ☐ The terms "Voluntary" and "Mandatory" are often used to describe evacuation orders. However, Humboldt County uses the terms: "Precautionary" and "Immediate Threat." These terms are used to alert you to the significance of the danger. All evacuation instructions provided by officials should be followed immediately for your safety. It must be noted that there is no statute that can be used to force residents from their homes. However, once you voluntarily evacuate, you can be refused re-entry.
- ☐ Do not return to your home until fire officials determine it is safe. Notification that it is safe to return home will be given as soon as possible considering safety and accessibility.
- ☐ When you return home:
    - Be alert for downed power lines and other hazards.
    - Check propane tanks, regulators, and lines before turning gas on.
    - Check your residence carefully for hidden embers or smoldering fires.

For more information, see www.readyforwildfire.org/evacuation_steps.

If You Are Unable to Evacuate

If a catastrophic event occurs, you may not be able to reach designated evacuation sites. In such cases, you may need to make decisions on your own about seeking shelter where you can survive the passage of the wildfire until an evacuation site can be reached. This is sometimes referred to as "*sheltering in place*". Firefighters and law

[61] *See section II.3.5 Evacuation Routes and Vulnerability in Part II. Risk Assessment for information about evacuation procedures and challenges in Humboldt County.*

enforcement do not recommend sheltering in place, especially given the 2009 tragedy in Australia when many did not evacuate and died. Often, residents do not have the proper equipment or training to stay behind as opposed to evacuating.

Although there are areas in Humboldt County that may be suited to sheltering in place, this practice is not recommended. There are several factors that make sheltering in place a very dangerous option in many parts of the county, including steep terrain, dense forest canopies, the direction from which wildfires come, and narrow and dead-end roads. Therefore, you should not shelter in place unless told to do so by a Sheriff's deputy, other law enforcement, or the fire department. If the fire department knows there are citizens who have stayed, they must attempt to rescue these citizens. This pulls critical resources away from fighting the fire and saving homes and jeopardizes the lives of firefighters as well as other citizens who are trying to evacuate.

However, if you are trapped and evacuation is not an option, the safest location may be your home. This should only be considered as an option if adequate defensible space has been maintained, if a water supply is available, and if fire safe construction materials are used. If the home does not have these qualities, a near-by temporary survival area will need to be found. Temporary survival areas should be clear of flammable vegetation and are often located on large river bars, irrigated fields, or an open area that has already been burned. The recommended size of the area will vary depending on surrounding conditions. The greater the size of the flame height, the greater the volume of surrounding vegetation, the steeper the slope, the greater the wind speed, the higher the fire severity, or the larger the number of people or vehicles in the area, the larger the area needs to be[62]. Temporary survival areas follow similar size criteria as evacuation sites for determining their suitability. However, evacuation sites are places with facilities, such as bathrooms and cleaning stations that allow displaced residents to remain until the wildfire threat has passed. Evacuation sites are intended for much longer stays than temporary survival areas.

It can be very difficult to determine the right thing to do as the fire approaches. Before a wildfire threatens, you should talk to your local fire department about defensible space and possible appropriate survival areas in your neighborhood. It is important to note that the suitability of a survival area may vary depending on the location and severity of the wildfire. There is rarely a survival area in the wildland that is adequate for all wildfire conditions. It is also important to know the location of the wildfire before attempting to travel to a survival area or evacuation site, as roads are often blocked during wildfire events by flames and rolling debris.

[62] Survival areas are similar to safety zones used by firefighters which are defined by the National Wildfire Coordinating Group. The NWCG provides guidelines for safety zone size assuming no wind, no slope, and one fire truck; these guidelines could be used by resident as a rule of thumb if no other options are available. The distance from any vegetation that has the potential to burn should be at least four times greater than the continuous maximum flame length (flame length is used as a flame height approximation). For more information see the 2004 Fireline Handbook pages 12-15 (National Wildfire Coordinating Group. (2004). Fireline Handbook. NWCG Handbook 3, PMS 410-1, NFES 0065. Available at http://www.wildfirelessons.net/documents/flhb_410-1.pdf) and the 2010 Incident Response Pocket Guide page 7 (National Wildlife Coordinating Group. (2010). Incident Response Pocket Book. PMS 461, NFES 1077. Available at http://www.wildfirelessons.net/documents/nfes1077.pdf).

What to Do if You Become Trapped…

While in your vehicle:

- ☐ Stay calm.
- ☐ Park your vehicle in an area clear of vegetation.
- ☐ Close all vehicle windows and vents.
- ☐ Cover yourself with wool blanket or jacket.
- ☐ Lie on vehicle floor.
- ☐ Use your cell phone to advise officials—Call 9-1-1.

While on foot:

- ☐ Stay calm.
- ☐ Go to an area clear of vegetation (see description of a temporary survival area above)
- ☐ Lie face down, cover up your body
- ☐ Use your cell phone to advise officials—Call 9-1-1.

While in your home:

- ☐ Stay calm—keep your family together.
- ☐ Call 9-1-1 and inform authorities of your location.
- ☐ Fill sinks and tubs with cold water.
- ☐ Keep doors and windows closed, but unlocked.
- ☐ Stay inside your house.
- ☐ Stay away from outside walls and windows.

Preparing Pets and Livestock

In some areas, animals are not permitted at community evacuation sites. Pet and livestock owners should work with local fire officials to determine the protocol for managing animals in their communities. If you have pets and/or livestock, take the time now to plan how best to ensure their survival. The following text is from a brochure produced by the California Department of Food and Agriculture, "Disaster Preparedness for Dog and Cat Owners," which is available here: http://www.cdfa.ca.gov/ahfss/animal_health/pdfs/dompets.pdf.. There is also a brochure for birds and reptiles, available here: http://www.cdfa.ca.gov/ahfss/animal_health/pdfs/birdexot.pdf. And a brochure pertaining to horses and livestock is available here: http://www.cdfa.ca.gov/ahfss/animal_health/pdfs/lgeanim.pdf.

For more information on evacuating animals, please check out the following resources:

- CAL FIRE Animal Evacuation Fact Sheet:

www.fire.ca.gov/communications/downloads/fact_sheets/Animalevacuation.pdf

  - Also available in Spanish: www.fire.ca.gov/communications/downloads/fact_sheets/Animalevacuationspanish.pdf
- Sequoia Humane Society, 6073 Loma Ave, Eureka, CA 95503-6869, (707) 442-1782, www.sequoiahumane.org
- FEMA, Ready – Caring for Animals website & "Information for Pet Owners" brochure: http://www.ready.gov/animals
- ASPCA – Disaster Preparedness website: http://www.aspca.org/Home/Pet-care/disaster-preparedness

Figure V.2-4. Disaster Preparedness for Dog and Cat Owners[63]

WITH A LITTLE ADVANCE PLANNING,
YOU CAN SAVE YOUR PET'S LIFE IN A DISASTER

BEFORE:

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

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

DISASTER KIT. Maintain a disaster preparedness supply kit for each of your pets *(see below).*

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

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

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

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

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

DURING:

IF YOU TAKE YOUR PET:

• **Evacuate your pet early, if possible**.

• **Take your disaster preparedness kit**, including the pet's vaccination and medical records, as well as identification photographs.

IF YOU CAN'T TAKE YOUR PET WITH YOU:

• **Bring your pet indoors.** Never leave pets chained outdoors.

• **Prepare a pre-selected site indoors for your pet.** Use a room with no windows but adequate ventilation, such as a utility room, garage, bathroom, or other area that can be easily cleaned. Do not tie the animal(s) up.

• **Leave only dry foods and fresh water in non-spill containers.** If possible, open a faucet to let water drip into a large container or partially fill a bathtub with water. Do not leave vitamin treats, which could be fatal if over-eaten.

• **House cats and dogs separately, even if they normally get along.**

• **What about pets other than dogs and cats?** Plans for birds and reptiles can be found in the brochure entitled "Disaster Preparedness for Bird and Reptile Owners."

• **Small mammals, or pocket pets, should be transported in carriers suitable for maintaining the animals while sheltered.** Remember to take bedding materials. Keep animals in a quiet, safe place.

[63]Pacific Northwest Wildfire Coordinating Group. (n.d.) *Living With Fire.* Retrieved from http://www.auburnlaketrails.org/picture/living_with_fire.pdf

AFTER:

• **Pet behavior may change after an emergency.** Monitor your pets closely and keep them leashed. Familiar scents and landmarks may be altered, causing confusion and abnormal behavior.

• **Be aware of downed power lines, fallen trees, debris, and local wildlife that may be disturbed.**

• **If you find a pet,** call animal control or any emergency phone numbers set up after the disaster. Isolate it from your animals until it is returned to its owner or can be examined by a veterinarian.

IF YOU'VE LOST YOUR PET:

• **Visit each shelter in your area at least once every other day.** You must check the shelter in person; only you can truly identify your animal. Keep a current photo of your pet showing or describing any distinctive markings.

• **Create a flyer** with your pet's photo and description, pet's name, your name, and phone numbers where you can be reached.

• **When you do find your pet, immediately examine it for illness or injuries.** Obtain medical attention from your veterinarian if needed. Use caution when handling animals. Panicky or injured animals may bite.

Practice Your Plan!

Pet Disaster Preparedness Kit

- Pet carrier or cage for each pet
- Two-week supply of food and water
- Non-spill food and water bowls
- Medications and dosing instructions
- Pet first-aid kit
- Vaccination and medical records
- Your veterinarian's information
- Cat litter box and litter
- Newspaper
- Plastic bags for waste disposal
- Paper towels
- Disinfectants
- Leash and collar/harness
- Blankets
- Toys and treats
- Be sure to provide your pets with as many amenities as possible.
- Remember, they are counting on you for their survival and support!

Emergency Contact Information

• You will need to have your emergency contact information in one easily accessible place. This information is different in every county.

A well-planned and executed evacuation can reduce the impact of wildfire on you and your family. Start preparing today by reviewing "Ready, Set, Go!" Pick up a copy at your local fire station, or download it here: www.readyforwildfire.org/.

V.3. After the Fire

Once a fire burns through an area, a separate set of actions commences. For instance, wildfires that have burned at high severity may have dangerous adverse effects on *watershed* health and pose extreme safety issues to local communities. Water erosion is one of the main concerns. Hillsides that are completely burned, with all or most of the trees and vegetation gone, will not have the ability to hold back or absorb water when rainfall is heavy. In these situations the potential is high for catastrophic events like landslides—where entire hillsides can turn to liquid and move downslope. This was seen in 2010 in the communities surrounding the Angeles National Forest following the Station Fire and in the 2004 summer fires in Shasta County, where some homes were threatened that had burned only a few years ago.

In addition to *slope instability*, invasive species can take hold after fire, changing the ecological balance for decades. Once established, these invasive species increase future fire risk, as they are highly flammable in late summer when they carry fire very well. This increases the likelihood of more fires and, in turn, more weeds to perpetuate this cycle far into the future.

Directly following a fire the land is at its most sensitive. It is in an unstable state. Therefore, very careful consideration will need to be taken to ensure that your actions benefit its recovery. Section V.3.2 below details how to go about developing a restoration plan.

One of the best resources on this topic is the document *After the Burn* created by the Idaho Forest, Wildlife, and Range Experiment Station. Although it is not written for Humboldt County ecosystem types, it's still full of excellent information for those dealing with the after affects of wildfire on forestlands. You can find the document on the Oregon State Extension website at:
http://extension.oregonstate.edu/sites/default/files/community_pgs/wildfire_after_the_burn_2011.pdf.

V.3.1 Assess Your Situation

Because you lived through a fire does not mean it could not happen again. Learn to be better prepared next time. *Forestland Steward*[64] published this article after the 2003 firestorms:

Post-Fire Response, Assess Your Situation

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

Areas of concern:

The Homesite

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

[64] California Forest Stewardship Program. (2004). Post-fire response, assess your situation. *Forestland Steward* Newsletter, Spring 2004. Retrieved from http://ceres.ca.gov/foreststeward/pdf/newsspring04.pdf.

Post-Fire Response, Assess Your Situation

The Landscape

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

Streams

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

Roads

- Existing problems may be exacerbated by wildfire effects
- Damage to stream crossings, culverts
- Gullies, potholes, fill-slope failure, cut-slope failure, sediment deposits, wet spots
- Potential for culvert obstruction and diversion.

V.3.2 Developing and Implementing a Restoration Plan[65]

After a wildfire has burned through your property you will need to assess the impacts and decide what measures are necessary to restore and mitigate the damage. Similar to developing a fuel-treatment prescription, you will need to develop a post-wildfire recovery plan. It will outline the priority areas on your property to begin work, and the sequence, schedule, and timing of that work. Post-fire restoration activities focus on mitigating ecological damage and improving safety for your homesite and road network.

It is highly recommended that trained resource professionals be consulted in developing your plan. Sometimes a team of specialists (including hydrologists, geologists, soil scientists, botanists, foresters, and engineers) may need to be consulted to assess the impacts the fire may have caused. They can give you direction regarding how to develop a restoration plan to start the healing process. In addition to their advice, consider consulting with an ecologist to review your restoration plan. Often, activities that some professionals consider to be restoration can set back the cycle of ecological recovery, inflicting more damage on the already disturbed land. Some Humboldt residents live adjacent to state or national park lands. The resource staffs at those agencies can be a great help in developing a post-fire restoration plan.

Where to Begin?

Immediate and Long-Term Needs

In developing your restoration plan, prioritize both immediate needs and longer-term actions. Immediate needs relate to seasonal timelines and activities that need to occur right away, for both human safety and the mitigation of ecological impacts. Following a wildfire, you will likely need to be thinking about winter rains. To mitigate slides and erosion, your first step will be to stabilize these areas. Roadway infrastructure, homesite, and riparian areas are other places to immediately begin restoration projects.

[65] This section is based on the work of: Bey, M. (n.d.).Lomakatsi Restoration Project. Retrieved from www.lomakatsi.org, for ForEverGreen Forestry (www.forevergreenforestry.com).

Long-term actions are the recovery work that you will undertake over time. Restoration is a process and not a one-time occurrence. Planting native trees, shrubs, and grasses is part of long-term *restoration activity*. Planting locally appropriate native species is important to minimize the invasion of exotic weeds in the short term.

Restoration Plan Mapping and Layout

Following fire, consult with natural resource professionals to help you assess the damage. Get an aerial photograph of your property and designate zones for restoration priorities. Free aerial pictures can be obtained from online sites such as Google Earth;[66] be sure to check the photo date however, as it may not be as current as the fire. With this photo and subsequent map you can define those areas that burned the hottest, require immediate restoration, and need long-term restoration; and you can project locations of greatest concern. This map will correspond to a written plan that describes the proposed restoration activities. Using *Geographic Information Systems* (GIS) and *GPS* tools and technology can be extremely helpful in creating your maps and plan.

Developing a Restoration Priority List

Priority #1: Roads, Driveways, Homesite, and Steep Areas

In order to undertake restoration work, you need access to your property. Following a wildfire, weakened trees can fall across roads or threaten driveways and roads. Ensure safe access and exit by removing them.

Slope movement from a high-intensity fire followed by rains can cause slides above and below roads. Stabilize these areas with erosion-control methods. Trees that burned can pose safety issues along roads. These trees can be used to stabilize road banks by *contour-falling* them. You can achieve several goals with one activity. In restoration we call this *stacking functions.* In this situation you can increase safety of travel along your driveway, in turn using the trees to hold slopes in place. Always check with an experienced local arborist before removing any trees, especially native trees such as oaks.

If the fire burned hot within 100 feet of your home, you will need to take measures here to increase safety. If you have steep slopes below or above your house, perform safety-mitigation work and erosion control. If your homesite is on a steep slope directly above your neighbors, prioritize developing a mitigation plan.

Priority #2: Streams, Riparian Areas, and Sensitive Habitat Areas

After safety and access are ensured, focus restoration activities on mitigating stream impacts. To prevent sedimentation and erosion from entering streams, focus your attention on these locations. In addition to riparian areas and streams, think about upland slopes above stream corridors.

If you have identified important wildlife corridors, sensitive species and their habitat, and ecologically significant locations, you will also want to focus your attention on these places.

Priority #3: Remaining Wildlands

Following restoration treatments of the priority areas described above, focus the rest of your restoration activities on the long-term recovery of your wildlands.

It is important when planning post-fire restoration efforts that you focus attention on areas that have the greatest need. Following fire, some areas on your property may be fine left alone for natural recovery. Ultimately the natural world will heal itself—the land has been here longer than any one of us. What we are attempting to do is assist that recovery and mitigate further damage without causing additional problems. When developing your restoration plan, take into account each location and its specific needs. Directly after a fire things look charred and heavily impacted; however, new life is there and will literally rise from the ashes.

[66] Google Earth. (n.d.) Retrieved from http://earth.google.com

V.3.3 Make a Plan to Be Better Prepared Next Time

Living through a wildfire can be a life-altering experience. There is no other "wake-up call" quite like a wildfire. You will likely learn many new things about where you live and probably about who you are.

When replacing structures and/or landscaping after wildfire, use hardened home and defensible-space concepts like those outlined earlier in this document to help you design a more fire-safe home. If you lost 50% or more of your home, you will be required to meet the latest building codes when you rebuild, as described in "Hardened Homes" in Section V.1.1 above.

If you have to start from scratch, think about where to site a new structure. Where are those places on your property that burned less or not at all? What about putting your house there now? Look at the places on your property or in your neighborhood that survived and try to understand why. Talk to your neighbors about how their places survived and what they learned. Mimic those features that lead to survivability when working on other places on your property that did not fare so well. If you improve your understanding of your local landscape and how it reacts to fire, you can improve the survivability of your home and your ability to plan for future fires.

Finally, a few closing words from Dr. David Horne, who has been active with the Greater Laguna Fire Safe Council and a board member of the California Fire Safe Council since he lost his home to wildfire:

> "Though it may be difficult, try to avoid spending energy on blaming someone or group or agency or fate that 'caused' the wildfire to happen. Distance yourself from the doom-and-gloom personalities that will emerge to spread their message of sorrow. You only have so much personal strength and you will need it for the recovery phase in a post-incident situation. Think positively, talk positively, and act positively about the future. Concentrate on regeneration prospects and rebuilding your homes, neighborhoods, and community to be even better than before. Be a positive example of the incredible resiliency of the human spirit that will inspire your loved ones and others to pitch in to move forward with confidence and assurance. You can do it!"[67]

[67] Home, D., (Director, California Fire Safe Council), personal communication, March 15, 2007.

V.4. Legal Requirements

V.4.1 Fire-Safety Regulation Compliance

As stated throughout this CWPP, defensible space not only makes sense, it's the law. Many activities that will reduce your vulnerability to damage or loss from wildfire are mandated by local or state policies and regulations. The section below describes some of the most relevant policies and regulations related to homeowner wildfire safety in Humboldt County and in the State of California.

Humboldt County Code Title III, Div 11: Fire-Safe Regulations

Humboldt County applies standards to proposed development within the SRA[68] to reduce the risk of fire. These standards are a locally adopted equivalent to the state's SRA Fire Safe Regulations as authorized by PRC Section 4290. They have been approved by CAL FIRE as meeting or exceeding state regulations. New development in the SRA is subject to the County Fire Safe Regulations. The appropriate clearance of vegetation around new developments is inspected by County Building Division Staff with other improvements at the time of construction. The Humboldt County Building and Planning Department, in collaboration with CAL FIRE, work to ensure that these standards are met through the development permitting process. Requests for exemption from these standards may be submitted to the Planning Director and must be accompanied by detailed information about the area, and reasons for which the exemption is requested. Exemption requests are reviewed by CAL FIRE. Any person in violation of these regulations shall be guilty of a misdemeanor and subject to the penalties provided for in Section 112-5 of the Humboldt County Code.

The County's Fire Safe Regulations ordinance includes specifications regarding:

- **Road and Driveway Access**: Public and private roadways must provide safe access for emergency wildland fire equipment and civilian evacuation, concurrently. Standards for ensuring this safety pertain to road width, roadway surfaces, grades, and radius, as well as the availability of *turn-arounds* and *turn-outs*. There are also regulation standards applied to clearance and weight-bearing capacity of roadway structures, as well as driveways and gate entrances.
- **Street and Address Signs**: Standards ensure clear visibility and legibility of street and addresses signs to assist fire safety and emergency response.
- **Emergency Water:** Standards ensure the immediate availability of water for wildfire protection in appropriate quantities (2,500 gallons) and locations. These regulations are intended to facilitate rapid and effective firefighting response and apply to hydrant and fire valves as well as the signing of water sources.
- **Setbacks and Greenbelts:** Having a *point of attack* and defensible space for fighting wildfire is extremely important to the safety of firefighters and their equipment, as well as for civilians and structures on properties adjacent to greenbelts. For these reasons, standards expect strategic placement of greenbelts as separations between wildland fuels and structures; they require buildings to be setback a specific distance from property lines and roadways. Regulations also apply regarding the disposal or removal of flammable vegetation or fuel caused by development and construction.

The full text of the Humboldt County Fire-Safe Regulations can be viewed at the online Planning Library (http://www.co.humboldt.ca.us/planning/planning_library/fire_regs/firesafe.pdf) and at the Building Inspection webpage (www.co.humboldt.ca.us/planning/building/#forms) under "Forms and Handouts." Also available on the Building Inspection webpage are a Fire Safe Regulations Checklist, Exemption Request Forms, and a SRA Domestic Emergency Water Supply Systems manual that contain useful diagrams for helping individuals comply with regulation standards.

[68] *For more information on SRA, see Chapter II.3. Wildfire Protection Capabilities.*

Public Resources Code 4290 and 14 CCR 1270 *et seq.:* Fire Safety Standards[69]

Public Resources Code (PRC) 4290 and regulations in 14 CCR 1270 cover the basics of roads, driveway width, clearance, turn-outs, turn-arounds, signing, and water regulations related to fire safety. 4290 is usually enacted by local ordinances at the county level that are certified by the Board of Forestry (BOF). Counties are allowed to develop their own code as long as it meets or exceeds PRC standards. Humboldt County did adopt its own code—the County Fire-Safe Regulations—which is described in more detail above. The Humboldt County Regulations is the local functional equivalent to PRC 4191 and residents should look to it for compliance guidance.

Public Resources Code 4291/14 CCR 1299: Defensible Vegetation Clearing Around Structures

The State of California enforces basic fire-prevention principles through PRC 4291. "4291," as it's called, regulates the amount of fuel you can have around your property. It is a good summary of the basics of vegetation reduction for fire safety and defensible space. This is the law that required a minimum of 30 feet of defensible space. This was updated in 2004 to expand some of the 30-foot defensible requirements to 100 feet, as is the case for all of Humboldt County. It was again updated in 2008 (through SB 1595) to expand this to the property line, or further. The BOF adopted regulations in 2006 to provide greater specifications for the vegetation removal requirements for the area located 30 to 70 feet from a structure.

> The law requires the owner or person in control of a qualified property to significantly reduce the risk of ignition of a habitable structure by maintaining defensible space, as prescribed, within a certain number of feet from the above-described dwellings, buildings, or structures… Because this bill would change the definition of a crime, it would impose a state-mandated local program.[70]

The revised 4291 states:

> (1) Maintain defensible space no greater than 100 feet from each side of the structure, but not beyond the property line unless allowed by state law, local ordinance, or regulation and as provided in paragraph (2). The amount of fuel modification necessary shall take into account the flammability of the structure as affected by building material, building standards, location, and type of vegetation. Fuels shall be maintained in a condition so that a wildfire burning under average weather conditions would be unlikely to ignite the structure. This paragraph does not apply to single specimens of trees or other vegetation that are well-pruned and maintained so as to effectively manage fuels and not form a means of rapidly transmitting fire from other nearby vegetation to a structure or from a structure to other nearby vegetation. The intensity of fuels management may vary within the 100-foot perimeter of the structure, the most intense being within the first 30 feet around the structure. Consistent with fuels management objectives, steps should be taken to minimize erosion.
>
> (2) A greater distance than that required under paragraph (1) may be required by state law, local ordinance, rule, or regulation. Clearance beyond the property line may only be required if the state law, local ordinance, rule, or regulation includes findings that such a clearing is necessary to significantly reduce the risk of transmission of flame or heat sufficient to ignite the structure, and there is no other feasible mitigation measure possible to reduce the risk of ignition or spread of wildfire to the structure. Clearance on adjacent property shall only be conducted following written consent by the adjacent landowner.
>
> (3) An insurance company that insures an occupied dwelling or occupied structure may require a greater distance than that required under paragraph (1) if a fire expert, designated by the director, provides findings that such a clearing is necessary to significantly reduce the risk of transmission of flame or heat sufficient to ignite the structure, and there is no other feasible mitigation measure possible to reduce the risk of ignition or spread of wildfire to the structure. The greater distance

[69]Full text for these Public Resource Codes available at: CAL FIRE. (2012). *Fire Safe Regulations*. Wildland Hazard and Building Codes. Retrieved from http://calfire.ca.gov/fire_prevention/fire_prevention_wildland_codes.php

[70] Senate Bill 1595, Chapter 366 (2008). (p. 1.) Available at www.californiachaparral.com/images/sb_1595_bill_20080927_chaptered.pdf.

> may not be beyond the property line unless allowed by state law, local ordinance, rule, or regulation.[71]

CAL FIRE is the statewide agency that enforces PRC 4290 and PRC 4291 (*see below*). For many reasons, it is to your advantage to meet these minimum standards. As discussed earlier in this plan, it is the condition of this 100-foot area, which could make the difference between losing your home and saving it. *For the full text of PRC 4291, see Appendix K.*

Public Resources Code 4102, 4125-4229 and 14 CCR 1220: State Responsibility Area (SRA)

These statutes and regulations established the locations where CAL FIRE has the financial responsibility for preventing and suppressing fires. Not only are these designations important to local communities for defining the financial arrangements for fire protection services, they establish the locations where fire safe and defensible space laws or regulations apply.

Public Resources Code 4251-4255 and 14 CCR 1200: Hazardous Fire Areas

These laws and regulations allow petitioners to the Board Forestry and Fire Protection or CAL FIRE to establish hazardous fire areas (HFA). The designation provides for area closures and other restrictions for fire prevention within the HFA.

California Residential Code, Chapter 3, Section R313: Sprinkler Systems

As of January 1, 2011, all new dwellings, dwelling units, and one and two family townhomes are required to be equipped with an automatic fire sprinkler system. This ordinance states that sprinklers must be installed to protect all areas within a dwelling unit, whether via a stand-alone or multi-purpose wet-pipe sprinkler system. However, such a system shall not be required when additions or alterations are made to existing townhouses or one- and two-family dwellings that do not already have automatic sprinkler systems in place; such additions or alterations are exempt. Other exemptions where sprinklers are not required include attics, crawl spaces, clothes and linens closets, bathrooms less than 55 square feet in size, and detached garages or carports without habitable spaces.

Sprinkler systems are valuable safety precautions in protecting people and residences against fire danger. All new permitted residential construction, as specified above, will require this sprinkler system. If you live in an older or unpermitted home, installing sprinklers as a retrofit is also possible. There are local contractors who are knowledgeable about these installations.

The full text on Automatic Fire Sprinkler Systems can be viewed online at the Building Inspection webpage under "Sprinkler Systems."[72] This webpage also provides links for additional information regarding fire sprinklers, including a "Water Supplies for Home Fire Sprinkler Systems Fact Sheet" and a link to the "International Residential Code Fire Sprinkler Coalition" website.

Public Resources Code 4292-4296 and 14 CCR 1256: Fire Prevention for Electrical Utilities

These statutes and regulations address the vegetation clearance standards for electrical utilities. They include the standards for clearing around energy lines and conductors such as power-line hardware and power poles. These laws and regulations are critical to wildfire safety because of the substantial area of power lines in wildlands, the historic source of fire ignitions associated with power lines, and the extensive damage that results from power-line fires in severe wind conditions.

Government Code 51175: Very High Fire Hazard Severity Zones

This Code defines Very High Fire Hazard Severity Zones and discusses its implementation. This Code came about following the 1991 Oakland Hills fire and the resultant "Bates Bill" (AB 337).

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[71] Senate Bill 1595, Chapter 366 (2008). (p. 6.)

[72] County of Humboldt, Planning and Building Department (n.d.). *Sprinkler Systems.*

> The purpose of this chapter is to classify lands in the state in accordance with whether a very high fire hazard is present so that public officials are able to identify measures that will retard the rate of spread, and reduce the potential intensity, of uncontrolled fires that threaten to destroy resources, life, or property, and to require that those measures be taken.[73]

CAL FIRE's Fire and Resource Assessment Program (FRAP) uses this information to:

> …provide updated map zones, based on new data, science, and technology that will create more accurate zone designations such that mitigation strategies are implemented in areas where hazards warrant these investments. The zones will provide specific designation for application of defensible space and building standards consistent with known mechanisms of fire risk to people, property, and natural resources.[74]

Knowing that your property is rated high or very high *fire hazard severity* can motivate you to take action to mitigate the risk of wildfire losses. There are also certain standards that apply to different severity zones that residents should be aware of; such as required ratings for roofing materials. Most of the eastern region of Humboldt County is classified as Very High Fire Hazard Severity Zone. *See Chapter II.1 Wildfire Environment for more information on fire hazard severity zones.*

Government Code 51189: WUI Building Standards

This Code is a result of AB 1216 (Vargas) and directs the Office of the State Fire Marshal to create building standards for wildfire resistance. This was updated in 2008 through SB 1595, and again in 2010. This is the legal basis for the WUI Building Standards referred to in section V.1.1 in this document.

> The Legislature finds and declares that space and structure defensibility is essential to effective fire prevention. This defensibility extends beyond the vegetation management practices required by this chapter, and includes but is not limited to, measures that increase the likelihood of a structure to withstand intrusion by fire, such as building design and construction requirements that use fire-resistant building materials, and provide protection of structure projections, including, but not limited to, porches, decks, balconies and eaves, and structure openings, including, but not limited to, attic and eave vents and windows.[75]

As of 2011, the WUI standards relevant to fire-safe construction for all new structures in the SRA are the California Building Code, Chapter 7A (applied to commercial construction) and the California Residential Code, Chapter 3, Section R327 (applied to residential construction).[76]

Government Code 65302.5: General Plan Fire Safety Element Review

This statute requires the State BOF and Fire Protection to provide recommendations to a local jurisdiction's General Plan Safety Element at the time that the General Plan is being amended. While not a direct and binding fire prevention requirement for individuals, General Plans that adopt the BOF's recommendations include goals and policies that provide for contemporary fire prevention standards for the jurisdiction. The programs and standards typically recommended by the BOF are related to local agency development of fire plans, adoption of Fire Hazard Severity Zone maps, adoption of ignition-resistant building codes, reduction of hazards to structures and neighborhoods that do not meet contemporary fire-safe standards, planning for emergency access in open-space areas associated with the jurisdiction, providing adequate levels of emergency services, and addressing post-wildfire safety and recovery programs.

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[73] California Government Code 51176 (2010). Available at http://www.leginfo.ca.gov/cgi-bin/displaycode?section=gov&group=51001-52000&file=51175-51189

[74] CAL FIRE. (2007). *Fire Hazard Severity Zone Re-Mapping Project.* Retrieved from http://frap.fire.ca.gov/projects/hazard/fhz.html

[75] California Government Code 51189, section a (2009). Available at http://legix.info/us-ca/codes;gov/doc(sec51189).html

[76] The most up-to-date versions of these codes are stored on the Humboldt County Building Inspection Division webpage at: County of Humboldt, Planning and Building Department. (n.d.). *Building Codes.* Building Inspection Division. Retrieved from www.co.humboldt.ca.us/planning/building/#codes.

The regulations summarized above may seem daunting at first; don't let them intimidate you from getting started now on creating your defensible space around your hardened home. When in doubt, and for assistance, contact your local CAL FIRE office, or the Humboldt County Planning and Building Department, at (707) 445-7541

V.4.2 Environmental Protection Compliance

Reducing hazardous fuels on your property can significantly decrease your vulnerability to losses due to wildfire and can often enhance the ecological quality of the landscape; however, these actions also cause alterations within the physical environment and therefore have the potential to negatively impact wildlife species and their habitat. When planning wildfire mitigation projects that may alter the physical landscape, you should first make sure that you are in compliance with laws designed to help protect the environment. Some of the most relevant policies and regulations related to environmental compliance are described below.

Humboldt County Zoning Ordinance, Section 314-61.1: Streamside Management Area Ordinance

Humboldt County applies standards to the use of and proposed development within or affecting *Streamside Management Areas* (SMAs) and other wet areas such as: natural ponds, springs, vernal pools, marshes, and wet meadows (exhibiting standing water year-long or riparian vegetation).[77] The provisions of this ordinance pertain to all Land Use and Development permits issued by the County related to Planning, Subdivision Regulations, Building Regulations, and Protection and Control of County Roads and Permits. A site evaluation shall be made where necessary to determine if a project/activity (such as hazardous fuel reduction) meets the exemption standards of these regulations or if the proposed development requires a special permit.

Permissible development within SMAs is limited but may include activities such as noncommercial cutting of firewood and removal of vegetation for public safety purposes. Development within SMAs requires certain specific mitigation measures, including retaining live trees with visible evidence of use as nesting sites, and erosion control measures. All development activities related to SMAs are prohibited from discharging or placing quantities of soil, vegetation, or other organic or inorganic materials into any SMAs in quantities that could be deleterious to fish, wildlife, or other beneficial uses.

If you are unsure of the law, or unclear about whether your proposed development or activity applies to an SMA, contact the County Planning and Building Department for guidance prior to moving forward. They can be reached by calling (707) 445-7541, or by visiting their website at: www.co.humboldt.ca.us/planning/. If you are interested in determining where SMAs may be located on your property, you can do so through the Humboldt County Web GIS Portal (http://gis.co.humboldt.ca.us/). A menu on the right hand side of the webpage allows you to select "SMAs," then zoom in on your location. If you know your parcel number, it will be simpler to locate your property and decipher any nearby SMAs.

Air Quality Regulations

The North Coast Unified Air Quality Management District (NCUAQMD) is the regional environmental regulatory agency, which has jurisdiction over the air quality in Humboldt, Del Norte, and Trinity Counties. The NCUAQMD applies rules and regulations that maintain and protect health-based state and federal Ambient Air Quality Standards to prevent the deterioration of air quality levels that may jeopardize human health and safety.

A major emphasis within air quality management is the enforcement of regulations related to *open burning*. Open burning refers to the use of outdoor fires for disposing of natural vegetation[78] from single or two family homes. It is also the type of burning often associated with maintaining defensible space around your home and strategic fuelbreaks on your property and roadways. Natural vegetation may only be burned on the property from

[77] *The full text of the Streamside Management Area ordinance is available at:* County of Humboldt, Planning and Building Department. (n.d.). *Humboldt County Zoning Regulations*. Planning Library. Retrieved from http://www.co.humboldt.ca.us/planning/planning_library.asp

[78] In this context, "natural vegetation" means vegetation grown on the property.

which it originates.[79] In order to burn, the vegetation must be properly dried and be free from waste such as garbage, plastic, treated or painted wood, tires, tar paper, demolition debris, etc; burning of poison oak should be avoided.

Even non-toxic smoke released at ground level can negatively affect the health of people in close proximity to the burn. Furthermore, smoke travels easily through neighborhoods and may become a public nuisance. Smoldering fires can be avoided by 1) only burning vegetation free of dirt and moisture, 2) covering vegetation piles to prevent rain exposure, and 3) stacking burn materials loosely to allow air circulation. Trees and branches less than two inches in diameter, and plant trimmings, must be dried for at least 30 days before burning.

In order to use open burning for the disposal of natural vegetation, a valid District Burn Permit is required year-round. On the other hand, small recreational or ceremonial campfires do not require a District permit. Additional permits are required by CAL FIRE during declared fire season. Burn permit applications are available from several locations, including CAL FIRE stations, local fire protection agencies, and through the District's website;[80] this website also offers the convenient option of renewing burn permits online. Burn permits are only issued at the NCUAQMD office, 2300 Myrtle Avenue in Eureka. In 2012, a standard residential burn permit costs $15.00 and authorizes an individual to burn one 4x4-foot pile of approved materials. Permits should be clearly posted when conducting an open burn.

Burn hours are from 6:00 am until 12:00 pm on permissive burn days only. Approved burn days can be determined by calling the "Burn Day Hotline" at (866) BURN-DAY, or (866) 287-6329. The NCUAQMD has separate requirements and guidelines pertaining to agricultural waste burns, development burns, forest improvement burns, prescribed burns, range improvement burns, and residential waste burns. Please contact the NCUAQMD's Burn Permit Program at (707) 443-3093 for information on these types of burning. The full text on Air Quality Management rules and regulations can be viewed at the NCUAQMD's website, accessible at: http://www.ncuaqmd.org/ . To report illegal burning or someone known to be a continual problem burner, call the NCUAQMD's Compliant Hotline at (707) 444-2233.

Residential open burning can be minimized by alternatively composting vegetation or "green waste" in yards, which can then be used for mulch and natural fertilizer in gardens. Vegetation can also be brought to a nearby biomass utilization facility where it will be used to create energy or mulch. Recycling materials such as cardboard, magazines and newspaper, and junk mail can also reduce burning.[81]

National Environmental Protection Act (NEPA) & California Environmental Quality Act (CEQA)

The National Environmental Policy Act (NEPA) was enacted in 1969 in recognition of "the profound impact of man's activity on the interrelations of all components of the natural environment,"[82] and it requires that federal agencies take certain environmental considerations into account prior to the implementation of projects, or "undertakings," that may adversely affect the environment, whether directly or indirectly. The California Environmental Quality Act (CEQA) is the California state equivalent of NEPA, which requires state and local agencies to "identify the significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible."[83] These laws exist to help preserve the health of the environment and the ecological integrity of America's landscapes.

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[79] North Coast United Air Quality Management District Regulation II, Open Burning Rule: 200-208. Available at http://www.ncuaqmd.org/index.php?page=rules.regulations

[80] North Coast Unified Air Quality Management District. (n.d.) Retrieved from http://www.ncuaqmd.org/.

[81] *For more information about alternatives to burning vegetation, including biomass conversion to energy, visit:* California Environmental Protection Agency (CEPA), Air Resources Board. (2011, August 8). *Biomass Burning Alternatives.* Retrieved from http://www.arb.ca.gov/smp/biomass/bio_map/altern_treat.htm

[82] The NEPA Statutue, 1969. Retrieved from http://ceq.hss.doe.gov/laws_and_executive_orders/the_nepa_statute.html

[83] California Natural Resources Agency. (2007). *Frequently Asked Questions about CEQA.* Retrieved from http://ceres.ca.gov/ceqa/more/faq.html

NEPA and CEQA require Environmental Assessments and Environmental Reviews, respectively, which determine the potential environmental effects a project may have. If there is potential for significant impacts to the environment, a more substantive review in the form of an Environmental Impact Statement or Environmental Impact Report becomes necessary to evaluate alternative options and ways of mitigating the potential impacts.

Any project or activity that is funded, permitted, or implemented by a federal agency is subject to the statutes of NEPA. Projects and activities that are funded, permitted, or implemented by a public agency must comply with CEQA. Public agencies subject to CEQA include state agencies, counties, cities, California Universities, and special districts. Although Fire Safe Councils are not considered public agencies, they may be responsible for compliance with these regulations when facilitating or implementing community projects; particularly if the project is supported by public dollars. Wildfire mitigation projects, such as fuel treatments, that involve limbing and pruning, ground disturbance, and prescribed fire, among others, have the potential for disrupting the natural environment and therefore may be subject to the statutes of NEPA and/or CEQA. Many grants and funding sources for community protection projects demand assurance that environmental compliance will be completed through either NEPA or CEQA, or both.

The agency responsible for administering CEQA is the California Department of Fish and Game (DFG). CAL FIRE may also be a valuable resource in assessing the necessary environmental compliance requirements for wildfire mitigation activities. Regional contact information for these agencies is listed below:

California Department of Fish & Game, Northern Region:	**Main Office:** 601 Locust Street Redding, CA 96001 **Telephone:** (530) 225-2300 **Fax:** (530) 225-2055 **Field Office:** 619 Second Street Eureka, CA 95501 **Telephone:** (707) 445-6493 **Fax:** (707) 445-6664 **Website:** https://r1.dfg.ca.gov/portal/
CAL FIRE HUU (Humboldt-Del Norte Unit):	**Fortuna Office:** 118 S. Fortuna Blvd. Fortuna, CA 95540 **Telephone:** 707-726-1270 Website: http://www.fire.ca.gov/

The agencies responsible for administering NEPA are the United States Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service, (NMFS)—also known as the National Oceanic and Atmospheric Association (NOAA). Matters pertaining to terrestrial wildlife, plant species, and freshwater aquatic species fall under the jurisdiction of the USFWS, while marine and anadromous aquatic species (those that spawn and are born in fresh water but spend most of their lives in the sea), fall under the jurisdiction of the NMFS.

Regional contact information for these agencies is listed below:

Arcata Fish and Wildlife Office **(U.S. Fish & Wildlife Service)**	**Arcata Office:** 1655 Heindon Road Arcata, CA 95521 **Telephone:** (707) 822-7201 **Fax:** (707) 822-8411 **Website:** http://www.fws.gov/arcata/

Bureau of Land Management (BLM), Arcata Field Office:	1695 Heindon Road Arcata, CA 95521 **Telephone:** (707) 825-2300 **Fax:** 707-825-2301 **Website:** http://www.blm.gov/ca/st/en/fo/arcata.html
National Marine Fisheries Service, Southwest Section	**Southwest Regional Office** 501 West Ocean Boulevard Long Beach, CA 90802 **Telephone:** (562) 980-4000 **Website:** http://swr.nmfs.noaa.gov/

For more information on NEPA, visit the Council on Environmental Quality's NEPA website, accessible here: http://ceq.hss.doe.gov/. *For more information on CEQA, visit the California Natural Resource Agency's CEQA website, accessible here:* http://ceres.ca.gov/ceqa/.

Federal Endangered Species Act (ESA)

The Federal Endangered Species Act (ESA) was enacted in 1973 to "protect and recover imperiled species and the ecosystems upon which they depend."[84] The USFWS and NMFS are required to list imperiled species as either *threatened* or *endangered*, and to designate *critical habitat* for those listed species. This law makes it illegal for any person to take a federally listed animal without a permit. The ESA defines "take" as: "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct." The term "harm" includes killing or injuring wildlife, directly or indirectly, such as by "impairing essential behavioral patterns, including breeding, feeding, or sheltering."[85] In California, there are 128 federally listed animal species and 184 listed plant species.[86]

To avoid any accidental takings and subsequent accountability, it is important to be conscientious of the possibility that federally listed species may be present on or near your property prior to conducting wildfire mitigation projects within the landscape. Whether your project is a private endeavor or federally funded, you may be required to consult with the USFWS to evaluate if there is a possibility that any threatened or endangered species or critical habitat will be negatively impacted as a result of the project.

Section 7 of the ESA, called "Interagency Cooperation," applies to federal agencies, which "must consult with the U.S. Fish and Wildlife Service when any action the agency carries out, funds, or authorizes (such as through a permit) *may affect* a listed endangered or threatened species."[87] This rule also applies if there is a possibility that critical habitat will be affected. Three types of permits may result from a Section 7 Consultation: 1) No Effect, Technical Assistance Letter; 2) May Affect, But Not Likely to Adversely Affect, Letter of Concurrence; and 3) Likely to Affect, Biological Opinion and Incidental Take Permit. The details and procedures pertaining to Section 7 are thoroughly outlined and explained in the "Endangered Species Consultation Handbook: Procedures for Conducting Section 7 Consultations and Conferences," which is available on the USFWS website, and is accessible through this link: http://www.fws.gov/endangered/esa-library/pdf/esa_section7_handbook.pdf.

Section 10 of the ESA stipulates that private activities occurring on private land that are likely to result in an "incidental take" of a federally listed species must first obtain a permit to do so. If it is possible to obtain federal

[84] U.S. Fish and Wildlife Service. (2013). *Endangered Species Program.* Retrieved from http://www.fws.gov/endangered/laws-policies/index.html

[85] Endangered Species Act. (1973). Retrieved from http://epw.senate.gov/esa73.pdf

[86] U.S. Fish and Wildlife Service. (2013). Listings and occurrences for California. *Species Reports.* Retrieved from http://ecos.fws.gov/tess_public/pub/stateListingAndOccurrenceIndividual.jsp?state=CA

[87] U.S. Fish and Wildlife Service. (2013). *Section 7 Consultation*: *A Brief Explanation.* Retrieved from http://www.fws.gov/midwest/endangered/section7/section7.html

funding or approval, or to avoid impacting listed species, it is advisable to do so, as the Section 10 process can be lengthy and complicated. Before applying for an incidental take permit, Section 10 requires that the applicant work with the USFWS/NMFS to develop project descriptions and land use objectives, and determine baseline conditions of the proposed project site. Then the applicant must design a Habitat Conservation Plan (HCP) to ensure that effects of the incidental take will be adequately minimized or mitigated. Included in the development of the HCP, is the negotiation of a Safe Harbor Agreement between the applicant and the USFWS/NMFS, which includes "No Surprises" assurances that protects the applicant from having to produce further compensation for "unforeseen circumstances." After the HCP is completed, the USFWS/NMFS will conduct their own internal Section 7 Consultation process and environmental assessment, followed by a public review period. Upon completion of all these steps, an incidental take permit may be obtained. The details and procedures pertaining to Section 10 are explained and outlined in the USFWS publication, "Habitat Conservation Plans: Section 10 of the Endangered Species Act," which is available on their website, and is accessible through this link: http://www.fws.gov/endangered/esa-library/pdf/HCP_Incidental_Take.pdf.

To determine whether a project you are planning has the potential to adversely affect federally-listed species, consult the California Department of Fish and Game (DFG) or the nearest USFWS office. You can arrange to have a biologist from one of these agencies visit your property to help determine whether federally listed species may be present or not.

For regional contact information for these agencies, see them listed in the tables above.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act was enacted in 1918 to block the commercial trade of birds and their feathers. This law prohibits killing, possessing, or trading migratory birds, and it applies to whole birds, parts of birds, nests, and eggs. Protected birds include all common songbirds, waterfowl, shorebirds, hawks, owls, eagles, ravens, crows, native doves and pigeons, swifts, martins, swallows, and others. Although this law does not protect the habitat of migratory birds, it does prohibit the destruction of active bird nests without a permit from the USFWS.

> "Activities related to fire management which are most likely to result in take of migratory birds include, but are not limited to, clearing or grubbing, tree pruning or limbing, prescribed burning, and vegetation removal in nesting habitat during nesting season when migratory bird eggs or young are likely to be present."[88]

Nest destruction and accidental taking of migratory birds can be best avoided by refraining from vegetation removal during the breeding/nesting season, which typically occurs on the coast between March 1 and August 31. If it is absolutely necessary to conduct work during this time period, hiring a biologist to survey for nesting birds and mark sites where they exist is recommended. It is also important to maintain a buffer of vegetation around these sites to avoid nest abandonment.

For more general information about the Migratory Bird Treaty Act, or to view a complete list of birds protected under this Act, visit the USFWS's Migratory Bird Program website, accessible though this link: www.fws.gov/migratorybirds/RegulationsPolicies/mbta/mbtintro.html.

National Historic Preservation Act (NHPA)

The National Historic Preservation Act (NHPA) of 1966 is similar to the ESA in that it requires federally funded, permitted, or implemented projects to undergo a review process prior to implementation; however, this law aims to preserve historic, archaeological, and cultural sites listed in the National Register of Historic Places—an inventory of historic resources that includes districts, sites, buildings, structures, objects, and archaeological resources. The National Register is maintained by the National Park Service; a link to the National Register of Historic Places is accessible here: http://www.nps.gov/nr/research/.

[88] ForEverGreen Forestry. (2010). A workshop for community wildfire protection plan projects: Compliance with federal environmental regulations. *Santa Monica Mountains CWPP, Appendix G.* Retrieved from http://www.forevergreenforestry.com/documents/App.G-ComplianceEnvRegs.pdf

Some fire management and mitigation activities have the potential to disrupt or damage historical or cultural sites, particularly those involving ground disturbance with mechanized equipment. If the project uses funds from a federal, state, or local agency, then it is most likely subject to Section 106 of the NHPA. Section 106 involves a review process that aims to minimize potential damage and harm to historic properties. This process requires the federal agency involved to consult with the Advisory Council on Historic Preservation (ACHP) as well as the State Office of Historic Preservation to resolve or mitigate any potential adverse effects. This process usually results in a Memorandum of Agreement, which outlines the measures (if any) that were agreed upon to minimize or mitigate adverse affects. A citizen's guide to understanding Section 106 is available online through the ACHP website; this document is accessible through this link: http://www.achp.gov/docs/CitizenGuide.pdf

Private landowners conducting fuel treatments should be mindful of the possibility that cultural resources exist on their property, regardless of whether or not they are receiving federal funding. This is particularly true in Humboldt County, which has a rich and diverse local Native American history. "Landowners who have cultural resources on their property are stewards of California's past. The guardianship of these sites provides future generations with the opportunity to learn from and experience our history."[89] Often, these sites exist without landowner knowledge, and may only be identifiable by to those trained to spot and recognize them.

If you suspect you have found a possible archaeological or cultural site or artifact, contact the California State Historic Preservation Office to report your finding**:**

California Office of Historic Preservation:	1725 23rd Street, Suite 100 Sacramento, CA 95816 **Telephone:** (916) 445-7000 **Fax:** (916) 445-7053 **Email:** calshpo@parks.ca.gov
California State Historic Preservation Officer:	Carol Roland-Nawi, PhD **Telephone: (**916) 445-7050

If you encounter any human remains on your property, do not disturb them! State Health and Safety Code Section 7050.5 prohibits any person from wantonly disturbing or willingly removing such remains without authority of law. If human remains are found, contact the Humboldt County coroner to report your finding.

Humboldt County Coroner's Office:	3012 I Street Eureka, CA 95501 **Telephone:** (707) 445-7242

Further information about the NHPA and the ACHP's efforts to protect historical and cultural resources, is available on the ACHP's National Historic Preservation Program website, accessible here: http://www.achp.gov/nhpp.html.

Additional Resources for Complying with Environmental Regulations:

For more thorough guidance and detailed information on complying with environmental regulations, protecting cultural resources, and using best management practices within fire management activities, please see the following publications available online through the ForEverGreen Forestry website[90]:

[89] U.S. Fish and Wildlife Service. (2010). *Best Management Practices for Protecting Cultural Resources.* Sand Diego County Community Wildfire Protection Plan. Retrieved from http://www.fws.gov/cno/docs/fire/BMPsCulturalResources_SD_CWPP.pdf

[90] www.forevergreenforestry.com

- A Workshop for Community Wildfire Protection Plan Projects: Compliance with Federal Environmental Regulations, accessible through this link: http://www.forevergreenforestry.com/documents/App.G-ComplianceEnvRegs.pdf
- Best Management Practices for Cultural Resources, accessible through this link: http://www.forevergreenforestry.com/documents/App.G-CulturalResourcesGuide.pdf

These documents are contained within the Santa Monica Mountains CWPP, Appendix G: Environmental Compliance Information. The entire Santa Monica Mountains CWPP can be accessed here: http://www.forevergreenforestry.com/smmcwpp_pub.html.

APPENDIX A:
ACRONYMS

APPENDIX A: ACRONYMS

List of Acronyms and Abbreviations

AED	Automated External Defibrillator
Alliance	California Fire Alliance
ALS	Advanced Life Support
AOB	Alternative Owner Builders
ARRF	Aircraft Rescue Fire Fighting
ATV	All-Terrain Vehicle
BAER	Burned Area Emergency Response
BIA	Bureau of Indian Affairs
BID	(Humboldt County) Building Inspection Division
BLM	Bureau of Land Management
BLS	Basic Life Support
BMP	Best Management Practice
BOF	Board of Forestry
BOS	Humboldt County Board of Supervisors
BVFC	Bridgeville Volunteer Fire Company
CAD	Computer-Aided Dispatch
CAFS	Compressed Air Foam System
Cal EMA	California Emergency Management Agency
CAL FIRE	California Department of Forestry and Fire Protection
CAL FIRE HUU	California Department of Forestry and Fire Protection Humboldt-Del Norte Unit
CalOSHA	California Occupational Safety and Health Administration
CalTrans	California Department of Transportation
CAR	Communities At Risk
CDF	California Department of Forestry and Fire Protection
CDF-HUU	California Department of Forestry and Fire Protection, Humboldt-Del Norte Unit
CDFG	California Department of Fish and Game
CD	Compact Disc
CDS	Humboldt County Community Development Services
CEQA	California Environmental Quality Act
CERT	Community Emergency Response Teams
CFSC	California Fire Safe Council
CNDDB	California Natural Diversity Database
CRC	Community Review Committee

CHP	California Highway Patrol
Cohesive Strategy	National Cohesive Wildland Fire Management Strategy
the Council	Northern California Prescribed Fire Council
CPA	Community Planning Area
CPFSC	Crooked Prairie Fire Safe Council
CPR	Cardio Pulmonary Resuscitation
CSA	County Service Area
CSD	Community Services District
CNDDB	California Natural Diversity Database
CR	College of the Redwoods
CRC	Community Review Committee
CWPP	Community Wildfire Protection Program
DFG	(California) Department of Fish and Game
DMA 2000	Disaster Mitigation Act of 2000
DOI	Department of the Interior
DPA	Direct Protection Area
ERC	Energy Release Component
EMD	Emergency Medical Dispatcher
EMS	Emergency Medical Services
EMT	Emergency Medical Technician
ERVTRT	Eel River Valley Technical Rescue Team
FBPS	Fire Behavior Prediction System
FEMA	Federal Emergency Management Agency
FHSZ	Fire Hazard Severity Zone
FICC	Fortuna Interagency Command Center
Fire Chiefs	Humboldt County Fire Chiefs' Association
FLAME Act	Federal Land Assistance Management and Enhancement Act
FLASH Program	Fire-adapted Landscapes and Safe Homes Program
FMP	Fire Management Plan
FMU	Fire Management Unit
FMZ	Fire Management Zone
FPA	Fire Program Analysis
FPD	Fire Protection District
FRA	Federal Responsibility Area
FRAP	Fire Resource Assessment Program

FRCC	Fire Regime Condition Class
FRX	Fire-Retardant Treated
FSC	Fire Safe Council
GDRCo	Green Diamond Resource Company
GIS	Geographic Information System
GPU	General Plan Update
GPS	Global Positioning System
HazMat	Hazardous Materials
HAM Radio	Amateur Radio
HBMWD	Humboldt Bay Municipal Water District
HCAOG	Humboldt County Association of Governments
HCFSC	Humboldt County Fire Safe Council
HCFDC	Humboldt County Fire Dispatch Cooperative
HFA	Hazardous Fire Areas
HFPD No. 1	Humboldt Fire Protection District No. 1
HFRA	Healthy Forests Restoration Act
HOACC	Humboldt Operational Area Communications Committee
HMP	Hazard Mitigation Plan / (Humboldt Operational Area) Hazard Mitigation Plan
HRCD	Humboldt Resource Conservation District
HROP	Humboldt Regional Occupation Program
HRSP	Humboldt Redwoods State Park
HSU	Humboldt State University
HVFC	Honeydew Volunteer Fire Company
HVFC	Hoopa Volunteer Fire Company
HVIR	Hoopa Valley Indian Reservation
HVT	Hoopa Valley Tribe
HWFD	Hoopa Wildland Fire Department
HWY	Highway
IC	Incident Command
ICS	Incident Command System
ISO	Insurance Services Office
JPA	Joint Powers Authority
KFPD	Kneeland Fire Protection District
KVFD	Kneeland Volunteer Fire Department

LAFCO	Local Agency Formation Commission
LANDFIRE	Landscape Fire Resource and Management
LM CWPP	Lower Mattole Community Wildfire Protection Plan
LMFSC	Lower Mattole Fire Safe Council
LOS	Level of Service
LRA	Local Responsibility Area
MFPP	Master Fire Protection Plan
MOU	Memorandum of Understanding
MRC	Mattole Restoration Council
MSR	Municipal Service Review
NCUAQMD	North Coast Unified Air Quality Management District
NEPA	National Environmental Policy Act
NEST	Neighborhood Emergency Support Teams
NF	National Forest
NFDRS	National Fire Danger Rating System
NFIRS	National Fire Incident Reporting System
NFPA	National Fire Protection Association
NMFS	National Marine Fisheries Services
NOAA	National Oceanic and Atmospheric Administration
North Coast EMS	North Coast Emergency Medical Services Agency
NPS	National Park Service
NWS	National Weather Service
OA	Operational Area
OASIS	Operational Area Satellite Information System
OCSD	Orleans Community Services District
OES	Office of Emergency Services
OSB FSC	Orleans/Somes Bar Fire Safe Council
OSHA	Occupational Safety and Health Administration
OVFD	Orleans Volunteer Fire Department
PG&E	Pacific Gas and Electric
PPC	Public Protection Classification
PPE	Personal Protective Equipment
PRC	Public Resource Code
PSA	Public Service Announcement

PSAP	Public Safety Answering Point
PUAP	Planning Unit Action Plan
PVFD	Petrolia Volunteer Fire Department
RAWS	Remote Automated Weather Stations
RAC	Resource Advisory Committee
RAMS	Risk Assessment and Mitigation Strategies
RAWS	Remote Automated Weather Stations
RCD	Rural Conservation District
RCEA	Redwood Coast Energy Authority
RID	Resort Improvement District
RMP	Resource Management Plan
RNP	Redwood National Park
RNPS	Redwood National Park Service
SB	Senate Bill
SEMS	Standardized Emergency Management System
SHEPT	Southern Humboldt Emergency Preparedness Team
SHFCA	Southern Humboldt Fire Chiefs Association
SHFSC	Southern Humboldt Fire Safe Council
SMA	Streamside Management Area
SOD	Sudden Oak Death
SRA	State Responsibility Area
SRNF	Six Rivers National Forest
SWAP	Sheriff Work Alternative Program
T&E Species	Threatened and Endangered Species
TPZ	Timberland Production Zone
TVFD	Trinidad Volunteer Fire Department
UC	University of California
UCANR	University of California Agriculture and Natural Resources Division
UCCE	University of California Cooperative Extension
USAR	Urban Search and Rescue
USDA	United States Department of Agriculture
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
VFC	Volunteer Fire Company
VFD	Volunteer Fire Department
VIP	Volunteers in Prevention

VMP	Vegetation Management Program
WCFSC	Willow Creek Fire Safe Council
WCSD	Weott Community Services District
WCVFD	Willow Creek Volunteer Fire Department
WFLC	Wildland Fire Leadership Council
WUI	Wildland-Urban Interface
WVFD	Westhaven Volunteer Fire Department
YVFC	Yurok Volunteer Fire Company

APPENDIX B:
GLOSSARY

APPENDIX B: GLOSSARY

Definitions listed in this Glossary came from the following sources:

- The 2006 Humboldt County Master Fire Protection Plan
- Fire Plans authored by Tracy Katelman of ForEverGreen Forestry - http://www.forevergreenforestry.com/fire.html
- http://www.fire.ca.gov/fire_protection/downloads/siege/Glossaryofterms.pdf
- http://www.nwcg.gov/pms/pubs/glossary/d.htm
- http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5296997.pdf

1-Hour Fuel: *See Fuel Description table.*

10-Hour Fuel: *See Fuel Description table.*

100- Hour Fuel: *See Fuel Description table.*

Access Roads/Routes: Roads that allow entrance into and out of a property. Routes available for fire trucks and equipment to approach and defend areas or structures, including roadways or driveways.

Advanced Life Support (ALS): a set of life-saving protocols and skills that extend Basic Life Support (BLS) to further support the circulation and provide an open airway and adequate ventilation (breathing).

All-Risk Fire Protection: Protection associated with fire response that may include fire protection, Emergency Medical Services (EMS), hazardous materials (HazMat), and rescue.

Aloft Winds: *See "Winds Aloft"*.

Amador Agreement: A contract that continues CAL FIRE staffing and station coverage through the winter "off season".

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

Annexation: The addition of a territory into a jurisdiction, such as a city or special district.

Anthropogenic: An adjective for something that is the result of human activities or the influence of humans on nature.

Apparatus: Fire apparatus includes firefighting vehicles of various types. For the purposes of the Humboldt County Master Fire Protection Plan, fire apparatus includes wildland fire engines, rescue vehicles, ladder and aerial trucks, engines, and water tenders.

Aspect: The cardinal direction toward which a slope faces: north, south, east, west, etc. This has an effect on fire behavior and intensity. South facing slopes dry out faster and have less moisture available for plants. North facing slopes tend to have denser vegetation because there is more moisture available for plants. While north slopes may not burn as frequently as south slopes, they can burn with more intensity because there is more fuel.

Assessment: The evaluation and interpretation of measurements, intelligence, and other information to provide a basis for decision-making.

Assets at Risk: Those things that are important to quality of life that can be threatened with destruction or loss from wildfire. These include homes, businesses, infrastructure, cultural sites, wildlife habitat, natural resources, air quality, recreational facilities and areas, historical structures, and any other important attribute that individual communities rely on for their well being.

Automatic Aid Agreement: An agreement between two or more agencies whereby such agencies are automatically dispatched simultaneously to predetermined types of emergencies in predetermined areas.

Backburn: *See Blackline.*

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

Basic Life Support (BLS): The level of medical care which is used for victims of life-threatening illnesses or injuries until they can be given full medical care at a hospital. It can be provided by trained medical personnel, including emergency medical technicians, paramedics, and by laypersons who have received BLS training. BLS is generally used in the pre-hospital setting, and can be provided without medical equipment.

Basins: *See Watershed.*

Best Management Practices (BMPs): In this context, fire safety activities that effectively reduce wildfire risk while limiting potential negative environmental impacts. BMPs can range from reducing impacts on specific wildlife species, to maintaining or enhancing ecosystem functions and processes.

Benefit Assessment: Benefit Assessments are used by local governments to pay the costs of providing fire suppression, flood control and other services to a particular community. These charges are based on the concept of assessing only those properties that directly benefit from the services or improvements financed. Because these charges are based on specific benefit, they are not subject to Proposition 13 limitations.

Big Red Truck Program: A community fire-safe education program where representatives from fire departments visit local residences and help landowners identify priority areas for hazard mitigation attention, such as high fuel loads and one-way-in, one-way-out roads. This program can help identify locations that are difficult for a fire truck to access.

Biochar: Organic matter that is burned slowly with limited oxygen until it becomes charcoal, which is then used as a soil amendment; *biochar* helps retain moisture in the soil, and it replenishes exhausted or marginal soils with organic carbon and fosters the growth of soil microbes essential for nutrient absorption. *Biochar* also has promise as a means of carbon sequestration.

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

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

Biomass Utilization/Recovery: The harvest, sale, offer, trade, or utilization of woody biomass to produce bioenergy and the full range of bio-based products including lumber, composites, paper and pulp, furniture, housing components, round wood, ethanol and other liquids, chemicals, and energy feedstocks.

Bioregional/Bioregion: the characteristic features of an area (bioregion) constituting a natural ecological community of contiguous geographic terrain, delineated by natural rather than artificial borders; the region's climate, local aspects of seasons, particular landforms, watersheds, soils, native plants, and animals. Humans are also an integral aspect of a bioregion's life.

Biotic: A term referring to all living things, organisms, or their materials; of life, of living things.

Blackline: Pre-burning, or backburning, of fuels adjacent to a control line before igniting a prescribed burn (controlled burn).

Blue Dot Program: A community fire-safety program which identifies the location of firefighting water sources by marking them with a blue reflective dot. This program also ensures that tanks and water systems are outfitted with fittings compatible with firefighting equipment and in some cases maps the location of these water sources.

Broadcast Burning: A controlled burn, where the fire is intentionally ignited and allowed to proceed over a designated area within well-defined boundaries for the reduction of fuel hazard, as a resource management treatment, or both.

Brush: A collective term that refers to stands of vegetation dominated by shrubby, woody plants, or low-growing trees.

Brushing: Clearing or "cleaning up" such vegetation in an area.

Brushfire: A fire burning in vegetation that is predominantly shrubs, brush, and scrub growth.

Bucket Dipping: A method of delivering water for aerial firefighting in which a specialized bucket is suspended on a cable from a helicopter, which dips the bucket into an open water source and carries water to the site of the fire.

Buffer Zone: An area of reduced vegetation that creates a barrier separating wildlands from vulnerable residential or business developments; this barrier is similar to a greenbelt in that it is usually used for another purpose, such as agriculture, recreation areas, parks, or golf courses.

Building Code: The building or construction code adopted by the jurisdiction.

Built Environment: Man-made structures as opposed to the natural environment.

Burn: (1) An area burned over by wildland fire. (2) A reference to a working fire. (3) To be on fire. (4) To consume fuel during rapid combustion. (5) A fire in progress or under investigation.

Burning Conditions: The state of the combined factors of the environment—such as winds, temperature, fuel moistures, and humidity—that affect fire behavior in a specified fuel type.

Burning Period: That part of each 24-hour period when fires spread most rapidly, typically from 10:00a.m to sundown.

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

Call Downs: Community telephone networks, such as phone trees, used to dispatch help and distribute or relay information in emergency situations.

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

Candle or Candling: A single tree or a very small clump of trees burning from the bottom up.

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

Canopy Density: A term used to describe the amount of vegetative cover in the top layer of a forest; among other things, the canopy density influences the amount of light penetration, understory composition, surface reflectance, and rainfall interception in a forest landscape.

Catastrophic Fire: Wildland or wildland-urban interface fire with a fast-moving front, extending over a large area (300+ acres) and/or highly destructive to lives, property, or natural resources.

CEQA: The California Environmental Quality Act (Chapters 1 through 6 of Division 13 of the Public Resources Code). A state statute that requires state and local agencies to identify the significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible.

Chaparral: A shrubland or heathland plant community associated with Mediterranean climates consisting primarily of highly flammable, drought-tolerant plants with hard, evergreen leaves. These communities tend to provide habitat for many different species.

Chimney: (1) Steep narrow draw or small canyons that draw fire up them in the same manner a flue draws heat from a fireplace. (2) A home containing one or more vertical or nearly vertical passageways for conveying flue gases to the outside atmosphere.

Chipping Program/Chipping Days: A program where several individuals or communities share the resources associated with processing debris from fuel-reduction activities, including the chipper (the machine that creates the chips), staff, insurance, etc.

Climax: A theoretical, ecological notion intended to describe a relatively stable community that is in equilibrium with environmental conditions, and occurring as the terminal, end-point of succession.

Coarse Woody Material: Large-dimension wood, usually 20 inches in diameter or larger, found on the ground from fallen trees or downed branches.

Collaborative: An open, inclusive process that assumes all participants have valuable knowledge and opinions and all of their comments are heard and considered; collaboration does not mean consensus or ownership.

Combustible: Any material that, in the form in which it is used and under the conditions anticipated, will ignite and burn.

Combustion: The rapid oxidation of fuel in which heat and usually flame are produced. Combustion can be divided into four phases: pre-igntion, flaming, smoldering, and glowing.

Community: A body of people living in one place or district and considered a whole; a neighborhood, subdivision, small town, village or township with boundaries defined by the residents or by regulatory jurisdiction.

Community at Risk (CAR): Wildland interface (see definition below) communities in the vicinity of Federal lands that are at high risk from wildfire. (See list in Federal Register, January 4, 2001).

Community Emergency Response Team (CERT) Program: This program educates people about disaster preparedness for hazards that may impact their area and trains them in basic disaster response skills, such as fire safety, light search and rescue, team organization and disaster medical operations. Using the training learned in the classroom and during exercises, CERT members can assist others in their neighborhood or workplace following an event when professional responders are not immediately available to help. CERT members also are encouraged to support emergency response agencies by taking a more active role in emergency preparedness projects in their community.

Community Services District (CSD): Sometimes called "junior districts," authorized under §61000 et seq. of the Government Code. CSDs can provide a broad range of municipal services (primarily to unincorporated areas), including fire protection. CSDs are normally governed by a five-member elected Board of Directors and can receive revenue from taxes and fees. In cases where a CSD is responsible for fire protection in Humboldt County, services are provided by a volunteer fire department with facilities and funding provided by the CSD.

Community Wildfire Protection Plan (CWPP): As defined by the Healthy Forests Restoration Act, a plan for a community at risk to wildfire that fulfills the following criteria:

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.

B) The plan identifies and prioritizes areas for hazardous fuels reduction treatments and recommends the types and methods of treatment on Federal and non-Federal land that will protect one or more at-risk communities and essential infrastructure.

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

Composite Decking: Deck boards manufactured from wood fiber and plastic to form a profile that requires less maintenance and generally has a longer lifespan than natural wood.

Composition: The percentage of each species that together comprise the biota present in a given area.

Condition Class: This landscape designation is based on a relative measure describing the degree of departure (low, moderate, or high) from the historical natural fire regime.

Conduction: Heat transfer through a material from a region of higher temperature to a region of lower temperature.

Conflagration: A raging, destructive fire. Often used to connote such a fire with a moving front as distinguished from a firestorm.

Conifer Forest: A stand of trees that are usually evergreen, cone-bearing, and with needle, awl, or scale-like leaves, such as pine, spruce, fir and cedar; often referred to as "softwood."

Contain a fire: A situation where a fuel break around the fire has been completed. This break may include natural barriers and/or manually built fireline and/or mechanically constructed line.

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

Contour Falling: Cutting and placing trees along the slope contour. This is a treatment that utilizes positioned logs to help control erosion from water flow. Logs are offset on the slope contour to slow water by creating a meandering travel path.

Control a fire: To complete a control line around a fire, any spot fires, and any interior islands to be saved; burn out any unburned area adjacent to the fire side of the control lines; and cool down all hotspots that are immediate threats to the control line, until the lines can reasonably be expected to hold.

Controlled Burning (or Prescribed Fire):A vegetation management practice that uses fire to improve habitat and/or reduce hazardous fuels. A plan for the prescribed burn must be written out and approved by fire department authorities, and specific requirements, such as obtaining a special permit, must be met before commencing burning.

Convection: (1) The transfer of heat by the movement of a gas or liquid; convection, conduction, and radiation are the principal means of energy transfer. (2) As specialized in meteorology, atmospheric motions that are predominantly vertical in the absence of wind (which distinguishes this process from advection), resulting in vertical transport and mixing of atmospheric properties.

Convection Column: Heat generated from a fire that rises in a column to varying heights above the flames, depending on the size of the burn.

County Service Area (CSA): Authorized under §25210.1 of the Government Code, CSAs are generally single purpose, dependent special districts governed by the County Board of Supervisors. CSAs are means of providing expanded service levels to unincorporated areas where residents are willing to pay for the extra services; services may include extended police protection, fire protection, park and recreation facilities, libraries, low power television and translation facilities and services. CSAs also may provide other basic services such as water and garbage collection if they are not already performed on a countywide basis.

Cover: Any plants or organic matter that hold soil in place and/or grow over and create shade that provides wildlife with an area to reproduce and find protection from predators and weather.

Critical Habitat: A specific geographic area, designated by the U.S. Fish and Wildlife Service, which is essential for the conservation of a threatened or endangered species, and may require special management and protection. Critical habitat may include an area that is not currently occupied by the species but that will be needed for its recovery.

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

Crown Fire (Crowning): A fire that spreads through the top of the vegetative canopy and is characteristic of hot fires and dry conditions. Crown fires become more or less independent from the surface fire and are generally more complex to control than surface fires.

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

County Service Area (CSA); CSAs are single purpose dependent special districts (governed by the County Board of Supervisors) authorized under §25210.1 of the Government Code as a means to "extend" services to growth areas within the unincorporated area, as well as provide funding for that extended service.

Dead Fuels /Dead Plant Matter: Fuels with no living tissue in which moisture content is governed almost entirely by atmospheric moisture (relative humidity and precipitation), dry-bulb temperature, and solar radiation.

Debris Burning: Any fire originally set for the purpose of clearing land or for burning rubbish, garbage, range, stubble, or meadow burning.

Decision Point: Established prior to tactical engagement and, once reached, forces or "triggers" firefighters to re-evaluate their situational awareness and tactical progress and effectiveness and to, ultimately, help them make critical decisions regarding their safety.

Defensible Space (i.e. Survivable Space): An area, either natural or manmade, where material capable of causing a fire to spread has been treated, cleared, reduced, or changed in order to provide a barrier between an advancing wildland fire and the loss to life, property, or resources. In practice, defensible space is defined as an area with a minimum of 100 feet around a structure that is cleared of flammable brush or vegetation. Distance from the structure and the degree of fuels treatment vary with vegetation type, slope, density, and other factors.

Detection: The act or system of discovering and locating fires.

Direct Attack: Any treatment of burning fuel, such as by wetting, smothering, or chemically quenching the fire or by physically separating burning from unburned fuel.

Direct Protection Area (DPA): That area for which a particular fire protection organization has the primary responsibility for attacking an uncontrolled fire and for directing the suppression action. Such responsibility may develop through law, contract, or personal interest of the firefighting agent.

Dispatch: The implementation of a command decision to move a resource or resources from one place to another.

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

Diurnal: Belonging to or active during the day (opposite of nocturnal).

Dominant: The species or individual that is the most abundant or influential in an ecosystem. For example, a dominant tree is one that stands taller than the rest and receives full sun, or the shrub species most abundant in the local understory.

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

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

Drafting Site: A location, such as a pond, river, or swimming pool, from which water may be drawn with a suction pump to be used for the purposes of fire protection.

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

Duff: The layer of decomposing organic materials located below the litter layer of freshly fallen twigs, needles, and leaves and immediately above the mineral soil.

Drainage(s): *See Watershed.*

Draw-Down Level: The level where the success of extinguishing a fire with initial attack forces is compromised.

Downed Fuel: *See Fuel Description table.*

Eave(s): The projecting overhang(s) at the lower edge of a roof.

Ecosystem: A community of organisms that makes up a specific area. Examples of ecosystem types include a pond or a forest.

Ecosystem Functions: The processes and interactions that occur between organisms and the physical environment.

Ecotone: The area where two or more ecosystems meet. The change in ecosystems may be due to elevation, soil type, disturbance, or other factors.

Egress: A means of exiting an area.

Embers: Burning (or glowing) particles of vegetation from tree branches, parts of shrubs or chaparral, or other combustible materials that ignite and burn during a wildfire and are carried in wind currents to locations in front of the wildfire (also known as *firebrands*).

Emergency Dispatch: *See Dispatch.*

Endangered Species: A population of organisms classified as such by the state or federal government as being at risk of becoming extinct because it is few in number and/or threatened by changing environmental or predation parameters.

Environmental Compliance: Conforming to environmental laws, regulations, standards, or other requirements imposed by local, state, or federal jurisdictions.

Environmentally Significant Habitat Area (ESHA): An area protected from human activities or development due to the existence of rare or especially valuable and/or vulnerable plants, animals, and habitats.

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

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

Estuary: A partly enclosed coastal body of water with one or more rivers or streams flowing into it, and with a free connection to the open sea. The inflow of both seawater and freshwater provide high levels of nutrients in both the water column and sediment, making estuaries among the most productive natural habitats in the world.

Evacuation: An organized, phased, and supervised withdrawal, dispersal, or removal of citizens from dangerous or potentially dangerous areas, and their reception and care in safe areas.

Evacuation Route: A path or road that has been preplanned for getting out of harm's way in a fire situation. The route should be well understood in advance of crisis by all participants. If there is any unclear direction, the path should be marked.

Evacuation Center/Site: A safety zone located within a community--usually on a large, flat, open area--where community members can go in cases of emergency evacuation; oftentimes, temporary shelters are established, and food, water, and medical supplies are distributed at these locations.

Exotic Species: Plant or animal species that have been introduced into an area where they do not occur naturally; non-native species.

Exposure: (1) Property that may be endangered by a fire burning in another home or by a wildfire; (2) Direction in which a slop faces, usually with respect to cardinal directions; (3) The general surroundings of a site with special reference to its openness to winds.

Extreme Fire Behavior: "Extreme" implies a level of fire behavior characteristics that ordinarily precludes methods of direct control action. One or more of the following is usually involved: high rate of spread, prolific crowning and/or spotting, presence of fire whirls, strong convection column. Predictability is difficult because such fires often exercise some degree of influence on their environment and behave erratically and/or dangerously.

Exurban: A region lying beyond the suburbs of a city.

Feather Out Treatment: When reducing hazardous fuels, thinning heavily near the structure or area in need of protection and thinning less as you move out away from it.

Federal Responsibility Area (FRA): Areas within which a federal government agency has the financial responsibility of preventing and suppressing fires. These lands are generally protected by the Department of Agriculture, Forest Service, and the Department of the Interior: Bureau of Land Management, National Park Service, US Fish and Wildlife Service, and the Bureau of Indian Affairs (see also State Responsibility Area and Local Responsibility Area).

Fee: Also termed "exaction." A direct charge or dedication collected on a one-time basis as a condition of an approval being granted by the local government. The purpose of the fee or exaction must directly relate to the need created by the development. In addition, its amount must be proportional to the cost of improvement. Includes development impact fees, permit and application fees which cover the cost of processing permits and development plans, and regulatory fees.

Felling: The process of downing individual trees; in hand felling, an axe, saw, or chainsaw is used to drop a tree, followed up by limbing, hewing, and cutting the tree into logs.

Fine (Light, Flash) Fuels: Fast-drying fuels, generally with a comparatively high surface area-to-volume ratio, which are less than ¼-inch in diameter and have a time-lag constant of one hour or less. These fuels readily ignite and are rapidly consumed by fire when dry.

Fire: Rapid oxidation, usually with the evolution of heat and light. Requires interaction of heat, fuel, oxygen.

Fire-adapted Ecosystem: Where plant species have, over time, assumed certain traits or characteristics that enable them to respond favorably to reoccurring fire events specific to the part of the ecosystem in which they inhabit and allows them to survive and/or regenerate.

Fire Behavior: The manner in which a fire reacts to the influences of fuel, weather, and topography. Common terms used to describe behavior include: smoldering, creeping, running, spotting, torching, and crowning.

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

Firebreak: A strip of land that has been cleared of vegetation to help slow or stop the spread of wildfire. It may be a road, trail, or path cleared of burnable material; a stream may also serve as a firebreak. *See Fuelbreak for the difference between the two.*

Fire Company: *See Volunteer Fire Company.*

Fire Department: *See Volunteer Fire Department.*

Fire-dependent: Plants, vegetation communities, and specific habitat types that have evolved to rely on fire in order to exist and/or thrive.

Fire Ecology: The study of fire and its relationship to the physical, chemical, and biological components of an ecosystem.

Fire-evolved Landscapes: *See fire-adapted ecosystem.*

Fire Flow: The flow rate of a water supply expressed in gallons per minute (gpm), measured at 20 pounds per square inch (psi) residual pressure, that is available for fire fighting.

Fire Flow Requirement: A measure comparing the amount of heat a fire is capable of generating (based on building construction and occupancy) versus the amount of water required for cooling the fuels below their ignition temperature.

Fire Frequency: General term referring to the recurrence of fire in a given area over time.

Fire Front: The part of a fire within which continuous flaming combustion is taking place. Unless otherwise specified, the fire front is assumed to be the leading edge of the fire perimeter. In ground fires, the fire front may be mainly smoldering combustion.

Fire Hazard: A fuel complex, defined by volume, type, condition, arrangement, and location, that determines the degree of ease of ignition and of resistance to control.

Fire Hazard Mitigation: Various methods by which existing fire hazard can be reduced in a certain area, such as fuel breaks, non-combustible roofing, spark arrestors, etc.

Fire Hazard Severity Zone (FHSZ): Any geographical area designated pursuant to California Public Resource Code Section 4201 to contain the type and condition of vegetation, topography, weather, and structure density to increase the possibility of conflagration fires. (Bates Bill AB 337 in 1992 modified Government Code for the purpose of identifying and mitigating hazards in areas prone to wildfire conflagration.) Areas are zoned as Very High, High, or Moderate by evaluating applicable risks and hazard.

Fire History: The known frequency and intensity of fires that have occurred in a given area over a period of time.

Fire Intensity: Amount of heat released by a fire in an area in any given time period. Fire intensity is usually related to the flame lengths of a fire.

Fire Interval: Number of years between two successive fire events for a given area. Also referred to as fire-free interval or fire-return interval.

Fire Ladders: *See "Fuel Ladders".*

Fireline: The forefront of the fire.

Fire Management: Activities required for the protection of burnable wildland values from fire and the use of prescribed fire to meet land management objectives.

Fire Management Plan (FMP): A strategic plan that defines a program to manage wildland and prescribed fires. The plan is supplemented by operational plans such as preparedness plans, preplanned dispatch plans, prescribed fire plans, and prevention plans.

Fire Occurrence Interval: *See "Fire Interval".*

Fire Perimeter: The entire outer edge or boundary of a fire. Note that while acreage of a fire is determined or estimated by the fire's perimeter, it is possible that some substantially smaller acreage may have actually been burned within that perimeter.

Fire Planning: Systematic technological and administrative management process of design, organization, facilities, and procedures, including fire use, to protect wildland from fire.

Fire Prevention: Activities such as public education, community outreach, law enforcement, and reduction of fuel hazards that are intended to reduce wildland fire and the risks it poses to life and property.

Fire Protection: Firefighting tactics used to suppress wildfires. Firefighting efforts in wildland areas require different techniques, equipment and training from the more common structure firefighting tactics used in populated areas.

Fire Protection Districts (FPD): Formal jurisdictional areas with some type of tax support authorized under §13800 et seq. of the California Health and Safety Code to provide fire protection and emergency medical services.

Fire Protection Water: Water stored, designated, or used specifically for the purposes of fire suppression and protecting people, structures, and natural resources from fire damage.

Fire Regime: Description of the patterns of fire occurrences, frequency, size, severity, and sometimes vegetation and fire effects as well, in a given area or ecosystem.

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

Fire Resistant: Construction designed to provide reasonable protection against fire.

Fire Resistive: Refers to properties or designs to resist the effects of any fire to which a material or structure can be expected to be subjected.

Fire Retardant: Any substance except plain water that, by chemical or physical action, reduces flammability of fuels or slows their rate of combustion.

Fire-Return Interval: *See "Fire Interval.*"

Fire Risk: The combination of vegetation, topography, weather, ignition sources, and fire history that leads to fire and/or ignition potential and danger in a given area.

Fire-Safe: For the purposes of the Humboldt County Master Fire Protection Plan this term is defined as: Action(s) that moderate the severity of a fire hazard to a level of "acceptable risk," as discussed in the Safety Element of the County General Plan. In a broader context this term describes the state of lessened severity or action(s) that moderate the severity of a fire hazard or risk, while protecting structures and surrounding property from fire, whether fire is inside the structure or is threatening the structure from exterior sources.

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

Fire-Safe Standards: Standards adopted by ordinance for the purpose of establishing a set of standards that will result in fire safe development within a specified area.

Fire Season: 1) Period(s) of the year during which wildland fires are likely to occur, spread, and affect resource values sufficient to warrant organized fire management activities. 2) A legally enacted time during which burning activities are regulated by state or local authority.

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

Fire Service: Organized fire protection service; its members, individually and collectively; allied organizations assisting protection agencies.

Fire Severity: Degree to which a site has been altered or disrupted by fire; loosely, a product of fire intensity and residence time.

Fire Spread: The movement of fire from one place to another.

Fire Storm: Violent convection caused by a large continuous area of intense fire. Often characterized by destructively violent surface indrafts, near and beyond the perimeter, and sometimes by tornado-like whirlse. Also known as blowup or extreme fire behavior.

Fire Suppression: All the work and activities connected with control and fire-extinguishing operations, beginning with discovery and continuing until the fire is completely extinguished.

Fire Weather: Weather conditions that influence fire ignition, behavior, and suppression, such as high temperature, low precipitation/humidity, and high winds.

Firewise: (1) A national, multi-agency effort designed to reach beyond the fire service by involving homeowners, community leaders, planners, developers, and others in the effort to protect people, property, and natural resources from the risk of wildland fire before a fire starts. (2) Firewise offers a series of practical steps that individuals and commuities can take to minimize wildfire risks to people, property, and natural resources. It emphasizes community responsibility for planning in the design of a safe community as well as effective emergency response, and individual responsibility for safer home evacuation and design, landscaping and maintenance.

Firewise Construction: The use of materials and systems in the design and construction of a home to safeguard against the ignition from a wildfire.

Firewise Landscaping: Vegetative management that removes flammable fuels from around a home to reduce ignition exposure from radiant heat. The flammable fuels may be replaced wtih green lawn, gardens, certain invidually spaced green, ornamental shrubs, individually spaced and pruned trees, decorative stone or other non-flammable or flame-resistant materials.

Flame Height: The average maximum vertical extension of flames at the leading edge of the fire front. Occasional flashes that rise above the general level of flames are not considered. If flames are tilted due to wind or slope, this distance is less than the flame length.

Flame Length: The distance between the flame tip and the midpoint of the flame depth at the base of the flame (generally the ground surface); an indicator of fire intensity.

Flame Resistant: A material or surface that does not propagate flame once the external source of flame is removed.

Flaming Front: The zone of a moving fire where the combustion is primarily flaming. Behind this flaming zone combustion is primarily glowing. Light fuels typically have a shallow flaming front, whereas heavy fuels have a deeper front. Also called *fire front.*

Flammability: The degree to which a substance is likely to catch fire, be easily ignited, burn quickly and/or have a fast rate of spreading flames.

Flash/Flashy Fuels: Fine fuels, such as grass, leaves, pine needles, ferns, mosses, and some kinds of slash, which ignite readily and are consumed rapidly by fire when dry.

FLASH (**Fire-adapted Landscapes and Safe Homes) Program**: a rebate program that reimburses property owners for hazardous vegetation management completed around their homes, along access routes, and in particularly hazardous areas.

Foëhn (Events/Winds): A wind that blows warm, dry, and generally strong, creating extremely dry fuel and dangerous fire potential.

Forest Stand Enhancement: A combination of silvicultural thinning practices and other forest restoration
activities (such as controlled burning) that aim to increase the health, resiliency, and vigor of tree communities within a forest ecosystem.

Free Burning: The condition of a fire or part of a fire that has not been slowed by natural barriers or by control measures.

Fuel(s): Combustible structures and vegetative materials. Includes dead plants, parts of living plants, duff, and other accumulations of flammable vegetation, such as grass, leaves, ground litter, shrubs, and trees that feed a fire. *(See "Surface Fuels.")*

Fuel Bed: An array of fuels usually constructed with specific loading, depth and particle size to meet experimental requirements; also commonly used to describe the fuel composition in natural settings.

Fuel Bed Depth: Average distance from the bottom of the litter layer to the top of the layer of fuel, usually the surface fuel.

Fuelbreak: A natural or constructed barrier used to stop or check fires that may occur, or to provide a control line from which to work.

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

Fuel Class: Part of the National Fire Danger Rating System (NFDRS). Group of fuels possessing common characteristics. Dead fuels are grouped according to one-, ten-, one hundred-, and one thousand-hour timelag, and living fuels are grouped as herbaceous (annual or perennial) or woody. *(See "Fuel Description."*

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

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

Fuel Compositions: The makeup of combustible materials, such as grass, leaves, plants, shrubs and trees, in a collective area; the mixture of these materials, how they interact, and their respective percentages within the whole influence the area's flammability.

Fuel Description: Designation of fuel materials into categories based on size and drying times. Fuel descriptions in use are described below:

Description	Material	Diameter
Fine	Needles, leaves, etc...	
1 Hour	Woody material, generally drying out within 1 hour.	<1/4"
10 Hour	Woody material, generally drying out within 10 hours.	1/4"-1"
100 Hour	Woody material, generally drying out within 4 days.	1-3"
1000 Hour	Woody material, generally drying out within 40 days.	3"+
Downed	Fuel on the ground	
Heavy	Large logs and snags	

Fuel Ladder: A ladder of vegetation from the ground into the canopy (or upper branches) of the trees that allows fire to climb upward.

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

Fuel Load: The amount of available and potentially combustible material, usually expressed as tons/acre.

Fuel Loading: The volume of fuel present expressed quantitatively in terms of weight of fuel per unit area.

Fuel Management: Act or practice of controlling flammability and reducing resistance to control of wildland fuels through mechanical, chemical, biological, or manual means, or by fire in support of land management objectives.

Fuel Model: (1) A standardized description of fuels available to a fire, based on the amount, distribution and continuity of vegetation and wood. (2) Simulated fuel complex (or combination of vegetation types) for which all fuel descriptors required for the solution of a mathematical rate of spread model have been specified.

Fuel Modification: Manipulation or removal of fuels to reduce likelihood of ignition and/or lessen potential damage and resistance to control (e.g. lopping, chipping, crushing, piling, and burning). Also known as fuel treatment.

Fuel Moisture (Fuel Moisture Content): The amount of water in a material divided by its oven-dry mass, expressed as a percentage. Moisture content is a key factor in determining how a fuel will burn, along with such factors as density and surface-to-volume ratio.

Fuel Reduction: Manipulation (including combustion and/or removal of fuels) to reduce the likelihood of ignition and/or to lessen potential damage and resistance to control.

Fuel Treatment: *See "Fuel Modification."*

Fuel Type: An identifiable association of fuel elements of a distinctive plant species, form, size, arrangement; or other characteristics that will cause a predictable rate of fire spread or difficulty of control under specified weather conditions.

Geographic Information Systems (GIS): A technology used for viewing, storing, analyzing and manipulating geographical information on a computer. Layers of information can create a better understanding of how data is interrelated. This technology is very useful for landscape-level planning efforts.

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

Global Positioning System (GPS): A system of navigational satellites operated by the U.S. Department of Defense and available for civilian use. The system can track objects anywhere in the world with an accuracy of approximately 40 feet (12 meters).

Goodwill Service: Fire protection services provided by a fire district to a location that is outside of the district's jurisdictional boundaries and for which no compensation is provided neither through direct payment nor a tax base.

Greenbelt: Landscaped and regularly maintained fuelbreak, usually put to some additional use (e.g. golf course, park, playground). Also known as fuelbreak.

Ground Disturbing: An action that interrupts the natural condition of the ground, such as digging and compaction from heavy equipment.

Ground Fire: Fire that consumes organic material beneath surface ground litter, such as a peat fire.

Ground Fuel: All combustible materials below the surface litter (including duff, tree or shrub roots, punchy wood, peat, and sawdust) that normally support a glowing combustion without flame.

Habitat: An ecological or environmental area that is inhabited by a particular species of animal, plant, or other types of organisms.

Hand Crews: Diverse teams of career and temporary wildland firefighters.

Hardened Homes: This term refers to improving a building's resistance to fire, such as updating a roof with noncombustible roofing material; the goal is to make the structure survivable in a fire.

Hazard: Any real or potential condition that can cause injury, illness, or death of personnel, or damage to or loss of equipment or property.

Hazard Assessment: Assessment hazards to determine risks. Assess the impact of each hazard in terms of potential loss, cost, or strategic degradation based on probability and severity.

Hazard Reduction/Mitigation: Any treatment of living or dead fuels that reduces the threat of ignition and fire intensity or rate of spread.

Hazardous Fuels/Fuel Loads: Accumulations of burnable materials including but not limited to living or dead vegetation, structures, and chemicals that can feed a fire.

Hazardous Fuels Reduction: Any treatment that reduces the amount of hazardous fuels.

Hazardous Materials (HazMat): Materials (such as those that are flammable or poisonous) that present a danger to life and the environment if not managed properly or released without precaution.

Hazardous Vegetation Management: Any treatment that reduces the amount of hazardous fuels.

Healthy Forests Restoration Act (HFRA): A portion of the 2003 President's Healthy Forests Initiative intended to reduce hazardous fuels on public and private lands. Establishes CommunityWildfire Protection Plans and sets standards for those plans.

Heart-Rot Decay: Fungus-caused decay of a tree's heartwood (interior wood). Trees are infected when fungal spores enter tree wounds or dead branch stubs and encounter conditions favorable for spore germination.

Heat Output: The total amount of heat that a fire releases in a specific area during the passing of the flaming front.

Heat Transfer: Process by which heat is imparted from one body to another, through conduction, convection, and radiation.

Heavy Fuels: Fuels of large diameter (such as snags, logs, and large limb wood) that ignite and are consumed more slowly than flash (fine, light) fuels.

Helibase: The main location within the general incident area for parking, fueling, maintaining, and loading helicopters. The helibase is usually at or near the incident base.

Herbaceous Fuels: Non-woody plants that die back in the winter.

High-Pruning: Cutting of both dead and live branches 10 to 15 feet up from the base of the tree. This is done on larger trees to separate the fuel connectivity from the ground to the crown of a tree.

Historic Natural Condition: The climax environmental condition of a property/area that occurred in the past, before fire suppression and industrial activities. Old photos, settlers' journals, elders' oral history, and clues on the property (such as old stumps) may be helpful in identifying the historical natural condition of an area.

Home Assessment: Evaluation of a dwelling and its immediate surroundings to determine its potential to escape damage by an approaching wildland fire. Includes the fuels and vegetation in the yard and adjacent to the home, roof environment, decking and siding materials, prevailing winds, topography, fire history, etc, with the intent of mitigating fire hazards and risks.

Home Density: The density of homes is determined by lot size, home arrangement, and number of homes per lot. This density affects the overall exposure, spread and intensity of wildfire.

Home Ignition Zone: the home and area out to approximately 100 feet, where local conditions affect the potential ignitability of a home during a wildfire.

Home-to-Home Ignition: The event of combustion initiation that creates fire as embers pass from one home to another. The action of one home igniting adjacent homes.

Humboldt County Fire Chiefs Association (HCFCA): An independent organization comprised of fire chiefs from each of the County's fire departments. The HCFCA serves as a sounding board for local fire service issues and contains several subgroups that carry out specific functions, such as fire prevention, training, and arson investigation.

Humboldt County Fire Dispatch Co-op: A Joint Powers Authority that includes 31 fire and EMS related service providers who have pooled resources in order to contract with CDF for dispatch services.

Humboldt County Operational Area Hazard Mitigation Plan (HMP): A multi-jurisdictional, multi-hazard local hazard mitigation plan. The plan includes a risk assessment and recommended mitigation actions to reduce vulnerability to damage from natural hazards. It is set up in two volumes so that elements that are jurisdiction-specific can easily be distinguished from those that apply to the whole planning area.

Hydrology: The science that describes the waters of the Earth, including movement, distribution, seasonal patterns, and conservation.

Hydrophobic soils: Literally meaning "water-fearing;" refers to soil that will no longer absorb water.

Ignitability: The susceptibility to ignite or catch on fire.

Ignition: The event of combustion initiation that creates fire.

Ignition Factor: The conditions, subsequent actions, and sequence of events that bring a competent ignition source into contact with the materials first ignited. Also referred to as the "cause of fire."

Ignition Management: A program that includes fire prevention program activities that are aimed at preventing the ignition of wildland fires and/or reducing damage from fires. Components include law enforcement, public education, engineering, fuels modification, and fire-safe planning.

Ignition Potential: Chance that a firebrand will cause an ignition when it lands on receptive fuels.

Ignition-Resistant: (1) Possessing properties that serve to slow or prevent possible ignition in order to slow the rate of fire spread. Can apply to vegetation or structural components. (2) The California Building Code defines *ignition resistant* in a specific way that is based on meeting a minimum flame-spread rating after the material has been subjected to a specified weathering procedure. A material that is *ignition resistant* has passed this test. The California Building Code is based on the International Code Council requirement for exterior fire-retardant wood (lumber and plywood).

Ignition Sources: Combustible elements that create the potential for fire starts, such as vehicle sparks near roadside fuels or downed power lines.

Immediate Threat Evacuation: An evacuation announcement made during an immediate or immanent fire situation and residents are in danger of life-threatening events.

Impact Fees: Fees (often called "developer fees" or “development impact fees”) that are levied on new development to cover the cost of infrastructure or facilities necessitated by that development.

Impingement: This occurs when flames from a fire touch an objects (e.g. a plant, deck, or building).

Incident: A human-caused or natural occurrence, such as wildland fire, that requires emergency service action to prevent or reduce the loss of life or damage to property or natural resources. Incident management teams also handle other non-fire emergency response, including tornadoes, floods, hurricanes, earthquakes, and other disasters or large events.

Incident Commander: The person within the Incident Command System who is responsible for overall management of the incident and reports to the Agency Administrator for the agency having incident jurisdiction.

Incident Command System: A standardized on-scene emergency management concept specifically designed to allow its user(s) to adopt an integrated organizational structure equal to the complexity and demands of single or multiple incidents, without being hindered by jurisdictional boundaries.

Indirect Attack: A method of fire suppression in which suppression activities takes place some distances from the fire perimeter, and often advantage of fire barriers.

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

Infrastructure: Roadways, utilities, and other basic elements serving developed areas.

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

Initial Attack: The actions taken by the first resources to arrive at a wildfire in order to protect lives and property and prevent further extension of the fire.

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

Initial Site Assessment: The preliminary steps of an evaluation of a piece of property to determine fuel hazards and health conditions. Information is gathered to help plan a fuel hazard-reduction treatment.

Interface Community. (Defined in the Federal Register, January 4, 2001) The Interface Community exists where structures directly abut wildland fuels. There is a clear line of demarcation between residential, business, and public structures and wildland fuels. Wildland fuels do not generally continue into the developed area. The development density for an interface

community is usually 3 or more structures per acre, with shared municipal services. Fire protection is generally provided by a local government fire department with the responsibility to protect the structure from both an interior fire and an advancing wildland fire. An alternative definition of the interface community emphasizes a population density of 250 or more people per square mile.

Interface Fuels: Refers to anything related to human development that can burn. Interface fuels are grouped into three categories: (1) urban structures; (2) landscaping; (3) urban "debris." Also known as "urban fuels."

Intermix Community: (Defined in the Federal Register, January 4, 2001) The Intermix Community exists where structures are scattered throughout a wildland area. There is no clear line of demarcation; wildland fuels are continuous outside of and within the developed area. The development density in the intermix ranges from structures very close together to one structure per 40 acres. Fire protection districts funded by various taxing authorities normally provide life and property fire protection and may also have wildland fire protection responsibilities. An alternative definition of intermix community emphasizes a population density of between 28–250 people per square mile.

Insurance Services Office (ISO): Private organization that formulates fire safety ratings based on fire threat and responsible agency's ability to respond to the threat. ISO ratings from one (excellent) to ten (no fire protection). Many insurance companies use ISO ratings to set insurance premiums. ISO may establish multiple ratings within a community, such as a rating of 5 in the hydrated areas and one of 8 in the non-hydrated areas.

Invasive Plants/Weeds/Species: Undesirable plants that are not native and have been introduced to an area by humans. These plants generally have no natural enemies and are able to spread rapidly throughout the new location. Some examples include Himalayan blackberries, English ivy, arundo, tamarisk, and Scotch broom.

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

Jurisdictional Agency: The agency having land and resource management responsibility for a specific geographical or functional area as provided by federal, state, or local law.

Jurisdictional Area/Boundaries: *See Response Area.*

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

Knox Box: A small safe typically mounted on a wall or post that holds the keys to a building or gate for firefighter or EMT use in emergency situations.

Ladder Fuels: Fuels that provide vertical continuity between strata and allow fire to carry from surface fuels into the crowns of trees or shrubs with relative ease. They help initiate and assure the continuation of crowning.

LAFCO--The Local Agency Formation Commission: Created by the State Legislature in 1963 to discourage urban sprawl and encourage the orderly formation and development of local government agencies. LAFCOs review proposals for the formation of new local governmental agencies and for changes in the organization of existing agencies. There is a LAFCO in each

county in California except San Francisco. LAFCO is a seven-member Commission comprised of two city council members (chosen by the Council of Mayors), two county supervisor members (chosen by the Board of Supervisors), two special district members (chosen by Independent Special District election), and one public member (chosen by the members of the Commission).

Landscape: The visible features of an area of land, including topography, water bodies, vegetation, human elements, such as land uses and structures, and transitory elements such as lighting and weather conditions.

Land use Plan(ning): A set of decisions that establish management direction for land within an administrative area; an assimilation of land-use-plan-level decisions developed through the planning process regardless of the scale at which the decisions were developed.

Large Fire: 1) CDF defines a fire burning more than 300 acres as a large fire. 2) A fire burning with a size and intensity such that its behavior is determined by interaction between its own convection column and weather conditions above the surface.

Late Seral/Succession Forest: A forest that has evolved, through successional processes, near to the end of the successional line, or climax forest. Only through disturbance (fire or clear-cutting, for example) will the forest return to an earlier seral (successional) stage.

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

Leaf Drop: A normal condition of growth for many plants, whose lower leaves gradually die and fall off.

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

Level-of-Service Standard (LOS Standard): Quantifiable measures against which services being delivered by a service provider can be compared. Standards based upon recognized and accepted professional and county standards, while reflecting the local situation within which services are being delivered. Levels-of-service standards for fire protection may include response times, personnel per given population, and emergency water supply. LOS standards can be used to evaluate the way in which fire protection services are being delivered, for use in countywide fire planning efforts.

Light Fuels: *See "Fine Fuels."*

Lightning Activity Level (LAL): A number, on a scale of 1 to 6, that reflects frequency and character of cloud-to-ground lightning. The scale is exponential, based on powers of 2 (e.g., LAL 3 indicates twice the lightning of LAL 2).

Limbing/Limb Up: Removing selected branches of a standing or fallen tree or shrub.

Litter: Top layer of the forest, scrubland, or grassland floor, directly above the fermentation layer, composed of loose debris of dead sticks, branches, twigs, and recently fallen leaves or needles, little altered in structure by decomposition.

Live Fuels: Living plants, such as trees, grasses, and shrubs, in which the seasonal moisture content cycle is controlled largely by internal physiological mechanisms, rather than by external weather influences.

Local Agency: Pursuant to Government Code §56054 means a city, county, or district. For the purposes of the Fire Plan, a Local Agency refers to a city or special district that provides fire protection.

Local Responsibility Area (LRA): Lands in which the financial responsibility of preventing and suppressing fires is primarily the responsibility of the local jurisdiction.

Local Agency Boundary: A specific land area that has been approved by LAFCO, within which a local agency (either a special district or a city) is obligated to provide services and from which the local agency generates tax revenue.

Manual Treatment/Fuel Reduction: Methods of modifying wildfire fuel complexes without the use of machinery; such treatments may include fire use applications, chemical treatments and livestock grazing.

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

Mechanical Treatments/Fuel Reduction: Methods of modifying fuel complexes with machinery; these treatments include: biomass removal, biomass thinning, rearrangement, chipping, piling, felling and piling, crushing, and mastication.

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

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

Mitigation: Those activities implemented prior to, during, or after an incident which are designed to reduce or eliminate risks to persons or property that lessen the actual or potential effects or consequences of an incident. Mitigation measures can include efforts to educate governments, businesses, and the general public on measures they can take to reduce loss and injury and area often informed by lessons learned from prior incidents.

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

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

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

Mulch: A material (such as decaying leaves, bark, or compost) spread around or over a plant to keep invasive weeds down, to reduce moisture loss and/or to enrich and insulate the soil; as a verb, the application of such material.

Mutual Aid Agreement: A reciprocal aid agreement between two or more agencies that defines what resources each will provide to the other in response to certain predetermined types of emergencies. Mutual aid response is provided upon request.

National Environmental Policy Act (NEPA): The basic national law for protection of the environment, passed by Congress in 1969. NEPA sets policy and procedures for environmental protection, and authorizes Environmental Impact Statements and Environmental Assessments to be used as analytical tools to help federal managers make decisions on management of federal lands.

National Fire Danger Rating System (NFDRS): A uniform fire danger rating system that focuses on the environmental factors that control the moisture content of fuels.

National Fire Plan: "A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-Year Comprehensive Strategy Implementation Plan." Prepared by the Secretaries of the Interior and Agriculture and Western Governors. May 2002.

National Fire Incident Reporting System (NFIRS): A database of fire incident reports compiled at the local fire department level. NFIRS was an outgrowth of the 1974 National Fire Prevention and Control Act, Public Law 93–498. The U.S. Fire Administration (USFA), an entity of the Department of Homeland Security, developed NFIRS as a means of assessing the nature and scope of the fire problem in the United States.

National Fire Protection Association (NFPA): An international non-profit organization whose mission is to reduce the worldwide burden of fire and other hazards on the quality of life by providing and advocating scientifically-based consensus codes and standards, research, training and education.

National Wildfire Coordinating Group (NWCG): An organization formed under the direction of the Secretaries of Agriculture and the Interior that includes representatives of the U.S. Forest Service, Bureau of Land Management, Bureau of Indian Affairs, National Park Service, U.S. Fish and Wildlife Service and National Association of State Foresters. The group's purpose is to facilitate coordination and effectiveness of wildland fire activities and provide a forum to discuss, recommend action, or resolve issues and problems of substantive nature. NWCG is the certifying body for all courses in the National Fire Curriculum.

Natural Barriers: Naturally existing breaks in fuel continuity within a landscape, which can help block the spread of fire in the direction of their location; natural barriers include: lakes, streams, ponds, roads, cultivated fields, and pastures.

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

Natural Fire Regime: (1) A natural fire regime is a classification of the role fire would play across a landscape in the absence of modern human mechanical intervention, but including the influence of aboriginal burning (Agee 1993, Brown 1995). Five natural (historical) fire regimes are classified based on average number of years between fires (fire frequency) combined with the severity (amount of replacement) of the fire on the dominant overstory vegetation.

Natural Resources: A necessary or beneficial material source (such as timber, minerals, water, and grazing area) occurring in nature that has a value in human commerce.

Niche: A species of population's role and/or function within an ecosystem. Includes resource use, interactions, etc.

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

Open Burning: the use of outdoor fires for disposing of natural vegetation around homes.

One-Way-In, One-Way-Out Roads: Non-continuous and non-connecting roads that constitute the sole ingress/egress route into/away from a particular location; oftentimes, these roads lead to residences or small neighborhoods, and are typically located in remote or semi-remote areas. These roads can become hazardous in emergency incidences when simultaneous home evacuations and emergency response are necessary.

Organic Matter: The fraction of soil that includes plant and animal residues at various stages of decomposition, cells and tissues of soil organisms, and substances synthesized by the soil population.

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

Patch Burning: A method of prescribed burning where patches of trees and vegetation are retained in a given area while other parts of the treatment area are thinned (selectively cut) at intermediate levels.

Pathogens: Insects or disease that can affect a site or individual plant.

Peak Fire Season: That period of the fire season during which fires are expected to ignite most readily, to burn with greater than average intensity, and to create damage at an unacceptable level.

Perennial: (1) Plants that live for more than two growing seasons. For fire danger rating purposes, biennial plants (alive for two growing seasons) are classed with perennials. (2) In reference to water, a stream that flows year-round during a typical year.

Permeability: In this case, a condition whereby fire can spread through a community with minimal negative impact.

Personal Protective Equipment (PPE): Equipment and clothing used and worn by all firefighting personnel in order to mitigate the risk of injury from, or exposure to, hazardous conditions encountered while working.

- Structure PPE, or Bunker Gear, includes NFPA/OSHA compliant helmet, goggles, hood, coat, pants, boots, gloves, pocket tools, and Self Contained Breathing Apparatus.
- Wildland PPE, includes 8-inch laced leather boots with lug soles, fire shelter, hard hat with chin strap, goggles, ear plugs, aramid shirts and trousers, leather gloves, and individual first aid kits.

Photo Point Monitoring: By utilizing a specific, identifiable point on a property from where photos are taken over time, it's possible to use the same view to compare and monitor changes.

Pile Burning: *See Debris Burning.*

Planning Unit (Planning Compartment): Geographic subdivisions of Humboldt County developed to support the Master Fire Protection Plan risk and capabilities assessment. The boundaries of the Planning Compartments were developed using existing Humboldt County planning tools, taking into consideration watershed boundaries, established community planning areas, fire department/district protection boundaries, tribal land boundaries, and State and federal agency administrative boundaries.

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

Plant Succession: In ecology, progressive change of the plant and animal life of an area in response to environmental conditions.

Point of Attack: That part of the fire on which work is started when suppression crews arrive.

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

Post-fire Effects: Lingering or residual impacts following a wildfire fire that create hazardous conditions for people and the environment. These may include soil erosion and slope instability, which can cause sedimentation in watersheds, negatively impact drinking water, and create flood risks; invasive species may also take hold and alter natural vegetation compositions and create additional fire hazards.

Pre-Fire Mitigation: Prior to fire ignition, a systematic application of risk assessment, safety, prevention, and hazard reduction techniques to reduce wildland fires, damages, and cost of suppression.

Pre-Fire Plan: A plan to address fire issues before ignition, including fire prevention actions such as hazardous fuel reduction. Occasionally, these plans may extend into the suppression phase of fire protection an detail such items as evacuation routes, fuelbreaks, and firefighting strategies.

Preparedness: (1) Activities that lead to a safe, efficient, and cost-effective fire management program in support of land and resource management objectives through appropriate planning and coordination. (2) Mental readiness to recognize changes in fire danger and act promptly when action is appropriate. (3) The range of deliberate, critical tasks and activities necessary to build, sustain, and improve the capability to protect against, respond to, and recover from domestic incidents.

Prescribed Fire (Controlled Burning): A fire that burns within a range of predetermined conditions (such as fuel moisture content, weather conditions, etc.) that will keep it controllable, at low intensity, and able to achieve its stated objectives. A written, approved prescribed fire plan must exist, and environmental requirements (where applicable) must be met, prior to ignition.

Precautionary Evacuation: An evacuation of the public away from an area which seems to be in the path of an oncoming, uncontained wildfire. Precautionary evacuations are especially likely in areas with limited ingress and egress in order to ensure that residents get out while they can and clear the road for emergency response vehicles.

Prevention: Activities directed at reducing the incidence of fires. Include public education, law enforcement, personal contact, and reduction of fuel hazards.

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

Protection Resources: Assets that are available to support fire protection efforts and public safety; protection resources include firefighting facilities, personnel and equipment, fire protection water storage and areas from which water may be drafted, open areas that can act as fuelbreaks or evacuation safe zones, and access roads.

Pruning: The act of cutting back the unwanted portions of a plant, or cutting for the purpose of enhancing growth.

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

Radiant Heat: Heat energy carried by electromagnetic waves longer than light waves and shorter than radio waves. Radiant heat (electromagnetic radiation) increases the sensible temperature of any substance capable of absorbing the radiation, especially solid and opaque objects.

Radiation: Transfer of heat in straight lines through a gas or vacuum other than by heating of the intervening space.

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

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

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

Relative Humidity: A measure of moisture in the air. If the humidity is 100%, the air is completely saturated with moisture. If the humidity is less than 20%, the air is very dry. When the air is dry, it absorbs moisture from the fuels in the forest, making them more flammable.

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

Residence Time: Time, in seconds, require for the flaming front of a fire to pass a stationary point at the surface of the fuel. The total length of time that one flaming front of the fire occupies one point.

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

Resistance to Control: The relative difficulty of constructing and holding a control line as affected by resistance to line construction and by fire behavior. Also known as difficulty of control.

Response: (1) Movement of an individual firefighting resource from its assigned standby location to another location or to an incident in reaction to dispatch orders or to a reported alarm. (2)

Activities that address the short-term, direct effect of an incident, including immediate actions to save lives, protect property, and meet basic human needs. Also includes the execution of emergency operations plans as well as mitigation activities designed to limit the loss of life, personal injury, property damage, and other unfavorable outcomes.

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

Resort Improvement Districts (RID): Districts authorized under §13000 of the Public Resources Code to provide a broad range of services (similar to CSDs), including fire protection, in unincorporated areas that are occupied seasonally for recreation and/or resort purposes.

Resource Management Plan (RMP): A document prepared by field office staff with public participation and approved by field office managers that provides general guidance and direction for land management activities at a field office. The RMP identifies the need for fire in a particular area and for a specific benefit.

Response Area: The Humboldt County Master Fire Protection Plan defines two types of response areas, District Response Areas and Non-District Response Areas.

- District Response Areas are areas outside the local agency boundaries of the special district or city within which the fire department associated with local agency provides fire protection.
- Non-District Response Areasare areas within which a volunteer fire company (see definition of VFC) provides fire protection. The primary difference between a response area (district or non-district) and a local agency boundary is that there is no legislated obligation for a fire department to provide structural fire protection within a response area.

Response Time: For the purposes of the Master Fire Protection Plan, response time is the time that elapses between the moment a 911 call is placed to the emergency dispatch center and the time that a first-responder arrives on scene. Response time includes dispatch time, turnout time (the time it takes firefighters to travel to the fire station, don their PPE, and prepare the apparatus), and travel time.

Restoration Activity/Efforts: Activities designed to help repair damage or disturbance caused by wildfire, or the wildfire suppression activity, that are intended to restore the landscape back to its original state.

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

Risk: (1) The chance of a fire starting as determined by the presence and activity of causative agents; (2) A chance of suffering harm or loss; (3) A number related to the potential of firebrands to which a given area will be exposed during the rating day.

Risk Assessment: The process of identifying and evaluating assets at risk.

Risk Factors: Factors can be either natural (weather i.e. wind, temperature) or human-associated. Human-associated risk factors are those we have control of such as building materials (roofs, chimneys, siding, windows, etc.), design, and location of the home, that can influence whether a

home or structure can easily ignite, and if so, whether fire can be sustained to the extent that the structure would be lost.

Roof Assembly: The component(s) above the roof structural framing including the roof deck, vapor barrier, insulation, roof cover, coatings, toppings, or any combination thereof.

Roof Classification: Roof classification is determined by tests that expose the top surface of roof decks to both gas flames and burning wood brands. Tests are arranged to provide three levels of severity by adjusting the temperature and duration of the gas flame and the sizes of the burning wood brands. Successful coverings are rated Class A, Class B, or Class C, with Class A withstanding the most severe exposure, Class B withstanding intermediate exposure, and Class C withstanding the least severe exposure.

Roof Covering: The membrane, which may also be the roof assembly, that resists fire and provides weather protection to the building against water infiltration, wind, and impact.

Safety Zone: An area cleared of flammable materials used for escape in the event the line is outflanked or in case a spot fire causes fuels outside the line to render the line unsafe. In firing operations, crews progress so as to maintain a safety zone close at hand, allowing the fuels inside the control line to be consumed before going ahead. Safety zones may also be constructed as integral parts of fuel breaks; they are greatly enlarged areas which can be used with relative safety by firefighters and their equipment in the event of a blowup in the vicinity.

Salvage Logging: Logging and removing merchantable trees after a fire to capture economic potential. This is a very controversial subject due to impacts on ecosystem recovery.

Sawlogs: A lot that meets minimum standards of diameter, length, and defect for sawing nto lumber.

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

Sediment/Sedimentation: Particles of topsoil, sand, and minerals that come from soil erosion or decomposing plants and animals; wind, water, and ice carry these particles. When excessive sediment collects in waterways it can harm fish and wildlife habitat.

Seedbank: A repository of dormant seeds found buried in the soil.

Sensitive Habitat/Environmentally Sensitive Habitat: Any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments. Sensitive habitat areas include, but are not limited to, riparian corridors, wetlands, marine habitats, sand dunes, sea cliffs, and habitats supporting rare, endangered, and unique species.

Sensitive Species: A plant or animal species that can tolerate a small range of resources and environmental situations, or habitat. These species raise concerns about population numbers and may be recognized locally as rare, or listed as Threatened or Endangered by the state or federal Endangered Species Act.

Serotinous: A condition where seeds are retained within cones that only open and release seeds en masse following fire. The mechanism varies, with some cones sealed by resin and waxes that melt during the fire, allowing the cones to open afterwards, releasing the seed.

Setback: The minimum distance by which any building or structure must be separated from a street or property line.

Shade-Tolerant: Attribute of a species that is able to grow and mature normally in and/or prefers shaded areas.

Shaded Fuelbreak: A fuelbreak built in a timbered area where the trees on the break are thinned and pruned to reduce the fire potential yet retain enough crown canopy to make a less favorable microclimate for surface fires.

Shelter-In-Place: During a wildfire, sheltering in place means to stay inside a home or structure that is fire-resistive and air tight, and remain there until the emergency is over.

Shrublands: Plant communities characterized by vegetation dominated by shrubs (woody plants with many branches, usually growing less than 8 meters high), often also including grasses, herbs, and geophytes. Mediterranean shrublands in the California North Coast contain northern coastal shrub and coastal sage scrub.

Signage: Address markers, road postings and street signs that designate the location of residences and help orient people within a community or area. Highly visible signage is important for helping emergency responders locate incident sites.

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

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

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

Slash: Debris left after logging, pruning, thinning, or brush cutting; includes logs, chips, bark, branches, stumps, and broken understory trees or brush.

Slope: Upward or downward incline or slant, usually calculated as a percentage. One percent of slope means a rise or fall of one foot of elevation within a distance of 100 feet. Thus, 45 percent would equal 45 feet of rise in 100 feet.

Slope Stability/Instability: The degree to which a slope is susceptible to erosion and slides, or the measure of its overall stability.

Small-diameter Wood Products: Logs generally less than 10-inches in diameter at the large end.

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

Social Capital: The individual and communal time and energy that is available for such things as community improvement, social networking, civic engagement, personal recreation, and other activities that create social bonds between individuals and groups.

Soffit: The underside of an architectural element such as a cantilever, an arch, a staircase, or a cornice.

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

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

Special District: As government organizations**, s**pecial districts are a type of local agency that delivers specific public services within defined boundaries. The Cortese-Knox-Hertzberg Local Government Reorganization Act of 2000 (the state law that governs the activities of LAFCO) more narrowly defines a special district and excludes school related districts, financing districts and numerous other districts.

Special Status Species: Animal or plant species that are officially listed, proposed for listing, or are a candidate for possible listing under the State and/or Federal Endangered Species Act. Also includes species that are biologically rare, very restricted in distribution, declining throughout their range, or have a critical, vulnerable stage in their life cycle that warrants monitoring.

Special Tax: Any tax imposed for specific purposes, including a tax imposed for special purposes, which is placed into a general fund. (Subdivision (d), Section 1, Article XIII C of the California Constitution). All taxes imposed by any local government shall be deemed to be either general taxes or special taxes. Special purpose districts or agencies, including school districts, shall have no power to levy general taxes (Subdivision (a), Section 2, Article XIII C of the California Constitution)

Species Composition: The combination of species found in a particular site.

Spot Fire: A fire ignited outside the perimeter of the main fire by flying sparks or embers.

Stacking Functions: Achieving several goals at once with one activity.

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

Standard: A criterion; the ideal in terms of which something can be judged. An acknowledged measure of comparison for quantitative or qualitative value.

Standardized Emergency Management System (SEMS):(Government Code § 8607). The group of principles developed for coordinating state and local emergency response in California. SEMS provides for organization of a multiple-level emergency response, and is intended to structure and facilitate the flow of emergency information and resources within and between the organizational levels--the field response, local government, operational areas, regions and the state management level. SEMS incorporates by reference: the Incident Command System (ICS); multi-agency or inter-agency coordination; the State's Mutual Aid Program; and Operational Areas.

Standard Operating Procedure: (1) A written organizational directive that establishes or prescribes specific operational or administrative methods to be followed routinely for the performance of designated operations or actions. (2) An organizational directive that establishes a standard course of action.

Stand-Replacing Fire: A fire that kills most or all of the trees in a section of forest.

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

State Responsibility Area (SRA): Defined in California Public Resources Code § 4125 – 4127 as lands in which the financial responsibility of preventing and suppressing fires is primarily the responsibility of the state. State Responsibility Areas are defined by code:

> § 4126. The Board of Forestry shall include within state responsibility areas all of the following lands: (a) Lands covered wholly or in part by forests or by trees producing or capable of producing forest products. (b) Lands covered wholly or in part by timber, brush, undergrowth, or grass, whether of commercial value or not, which protect the soil from excessive erosion, retard runoff of water or accelerate water percolation, if such lands are sources of water which is available for irrigation or for domestic or industrial use. (c) Lands in areas which are principally used or useful for range or forage purposes, which are contiguous to the lands described in subdivisions (a) and (b). § 4127. The Board of Forestry shall not include within state responsibility areas any of the following lands: (a) Lands owned or controlled by the federal government or any agency of the federal government. (b) Lands within the exterior boundaries of any city, except a city and county with a population of less than 25,000 if, at the time the city and county government is established, the county contains no municipal corporations. (c) Any other lands within the state which do not come within any of the classes which are described in Section 4126.

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

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

Streamside Management Areas (SMA): Wet areas within the natural environment, such as: natural ponds, springs, vernal pools, marshes, and wet meadows (exhibiting standing water year-long or riparian vegetation). The use of, or proposed development within or affecting these areas requires compliance with Humboldt County standards and regulations designed to protect the ecological health and integrity of the ecosystems they support.

Structure: Any building or structure used for support or shelter of any use or occupancy.

Structural Fire Protection: The protection of a structure from interior and exterior fire ignition sources. This fire protection service is normally provided by municipal fire departments with trained and equipped personnel. After life safety, the agency's priority is to keep the fire from leaving the structure of origin and to protect the structure from an advancing wildland fire. (The equipment and training required to conduct structural fire protection is not normally provided by the wildland firefighter.)

Structural Ignitability: The ease with which a home or other structure ignites.

Structural Protection Zone: Immediate 30-foot buffer zone around the home.

Structure Fire: Fire originating in and burning any part or all of any building.

Sudden Oak Death (SOD): A disease in oak trees that is a caused by *Phytophthora ramorum*, an invasive forest pathogen introduced to California in the mid-1990s through the horticultural plant trade. Affected areas can have a significantly higher fire hazard due to higher proportions of dead fuels of all sizes and prevalence of snags.

Suppression: All the work of extinguishing or containing a fire, beginning with its discovery.

Surface Fire: Fire that burns loose debris on the surface, which includes dead branches, leaves, and low vegetation. This type of fire kills many seedlings and can be damaging to young stands of spruce, fir, and hemlock, but usually causes minimal damange to mature ponderosa pine, Douglas fir, and western larch.

Surface Fuels: Loose surface litter on the soil surface, normally consisting of fallen leaves or needles, twigs, bark, cones, and small branches that have not yet decayed enough to lose their identity; also grasses, forbs, low and medium shrubs, tree seedlings, heavier branchwood, downed logs, and stumps interspersed with or partially replacing the litter.

Surface Mineral Soil: The top layer of the earth's surface, consisting of rock and mineral particles mixed with organic matter. Surface mineral soil is not flammable.

Survivable Space: The area between a noncombustible home and an oncoming wildfire where vegetation has been modified and maintained to reduce the potential for the home to burn. *Also see Defensible Space.*

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

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

Thinning: The act of removing a percentage of vegetation to encourage an open space and healthy growth for the remaining vegetation.

Threatened Species: Any species including animals, plants, fungi, etc. that is vulnerable to extinction in the near future, and is so classified by the state or federal government.

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

Touch-Off: A controlled burning operation performed by a forestry or fire crew, where large quantities of forest treatment slash are arranged in hand piles and ignited with drip torches simultaneously by multiple crew members.

Topographic Breaks: Natural formations within the topography of a landscape that can help break up fuel continuity and reduce the spread of fire. *Also see Natural Barriers.*

Topography: Geographic elements of an area, such as slope steepness, aspect, existence of hills, canyons, and rough terrain.

Treatment: An action or controlled technique that is applied in a specific process. *See "Fuel Treatment."*

Tributaries: A stream, creek, or river that flows into a main stem (or parent) river or lake. Tributaries do not flow directly into a sea or ocean.

Turn-Around Space: A portion of a roadway, unobstructed by parking, that allows for a safe reversal of direction for emergency apparatuses.

Turn-Outs: Open spaces along roadways, unobstructed by regular parking, that allow for the safe passage of vehicles and can provide emergency parking for firefighting apparatuses.

Type Conversion: The unintended replacement of native plant communities due to various disturbances, such as more frequent and unnatural fires. Typically replacement is by invasive or non-native plants.

Underburn: A prescribed fire method where burning is conducted in the understory so that the fire consumes surface fuels but not trees or shrubs. Also known as understory burning.

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

Unit Fire Weather Plan: A Unit Fire Weather Plan, otherwise known as a Fire Danger Operating Plan, is used to allow for a sound scientific based emergency dispatch system to be implemented. The plan facilitates a methodology to assure wildland fire dispatch levels are appropriate.

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

Urban Fuels: Any flammable materials within a landscape as a result of urban development. Examples include urban structures, landscaping, and urban debris such as wood piles, trash dumps along roadsides, and die-back from weedy invaders.

Values at Risk: *See Assets at Risk.*

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

Vegetation Composition: *See Plant Composition and/or Stand Composition.*

Vegetation Management: The use of fire, timber harvest, tree thinning, rangeland, and wildlife habitat activities, practices, and projects that alter the vegetation to meet vegetation resource management objectives.

Vegetation Type: A standardized description of vegetation. The type is based on the dominant plant species and the age of the forest. It also indicates how moist a site may be and how much fuel is likely to be present.

Vernal Pool: Seasonal amphibious environments dominated by annual herbs and grasses adapted to germination and early growth under water. Spring dessication triggers flowering and fruit set, resulting in colorful concentric bands around the drying pools.

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

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

Viewshed: The landscape or topography visible from a geographic point, especially that having aesthetic value.

Volunteer Fire Department: A fire department associated with a local agency (either a city of a special district authorized to provide fire protection) that is comprised almost entirely of volunteer, unpaid, firefighters, whose primary objective is community fire protection.

Volunteer Fire Company: A fire department not associated with a local agency (either a city of a special district authorized to provide fire protection) that is comprised almost entirely of volunteer, unpaid, firefighters. Volunteer Fire Companies also include volunteer firefighting organizations associated with Indian Tribes whose primary objective is community fire protection rather than wildland fire suppression, and volunteer firefighting organizations associated with timber/lumber companies who provide community fire protection.

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

Water Tender: A ground vehicle capable of transporting specified quantities of water.

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

Wildfire: An unplanned, unwanted wildland fire including unauthorized human-caused fires, escaped wildland fire use events, escaped prescribed fire projects, and all other wildland fires where the objective is to put the fire out. *See also: Wildland Fire.*

Wildfire Risk: *See Fire Risk.*

Wildlands: Areas in which development is essentially nonexistent, except for roads, railroads, power lines, and similar transportation facilities. Structures, if any, are widely scattered. Can also include large cattle ranches and forests managed for timber production.

Wildland Agency: Any federal, tribal, state, or county government organization participating in wildland fire protection with jurisdictional responsibilities.

Wildland Fire: A non-structure (i.e. non-home) fire that occurs in the wildland. Three distinct types of wildland fire have been defined and include wildfire, wildland fire use, and prescribed fire. *See also: Wildfire.*

Wildland-Urban Interface (WUI): The zone where structures and other human developments meet, or intermingle with, undeveloped wildlands.

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

Windthrow: Trees that are uprooted by wind events. Formerly protected stands whose edges are opened up and become vulnerable to this effect. Also known as "Blowdowns."

Woody Biomass: The trees and woody plants, including limbs, tops, needles, leaves, and other woody parts, grown in a forest, woodland, or rangeland environment, that are the by-products of forest management.

Woody Biomass Utilization: *See Biomass Utilization.*

APPENDIX C: REFERENCES

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APPENDIX D: MAPPING EXERCISE INSTRUCTIONS

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Community Wildfire Protection Plan
Community Mapping Exercise[1]

Please take a look at the maps displaying community values at risk, risks and hazards, safety resources, and proposed projects. This information was collected in a variety of ways over the past decade. Use the markers provided to modify, add to, and update the existing information.

Community Values at Risk (Green Highlighter)

- Where are the places and things you most value and want to see protected from wildfire?
  Examples include:
  - Hospitals and health care facilities
  - Businesses
  - Schools, Churches, and Stores
  - Community centers
  - Rare and endangered species, habitat, ecologically significant areas
  - Recreation areas
  - Culturally or historically significant areas
- What critical infrastructure needs to be protected from wildfire? Examples include:
  - Power substations & corridors
  - Communication sites and facilities
  - Municipal water supply facilities
  - Transportation corridors
  - Major manufacturing and utilities facilities

Wildfire Risk, and Hazards (Orange Highlighter, Red Marker, Pink Highlighter, Purple Marker)

- Where do you think a wildfire would start in your community?
- What are other wildfire hazards in your community?
  - Dead trees (insect or disease)
  - Slash from logging or thinning
  - Fuel storage
  - Abandoned wooden structures
  - Road systems – blocked, brushed over, or dead end roads
- What kind of road or structural conditions might increase fire risk?
  - Road maintenance needs (outages, slides, etc.) (Red marker)
  - Bridges and/or locked gates, especially bridges too small or weak to carry a fire truck (Red marker)
  - Power lines (Purple marker)

[1] This mapping exercise is based on the ongoing work of Tracy Katelman and ForEverGreen Forestry, www.forevergreenforestry.com.

- Where have fuels reduction projects already occurred? Identify defensible space treatments. (Pink highlighter)

- **Safety Resource (Blue Highlighter and Marker, Brown Marker, Black Marker,)** Where are there resources for fighting fires? What information needs updating?
  - Water storage: tanks, ponds, pools (Blue marker dot w/# 1,000 gallons (e.g. 5 =5000)
  - Equipment (**Brown marker**)
  - Access route/evacuation
  - Updated road conditions: roads that do not exist on the maps, or are on the maps and do not exist on the ground. (**Black marker**)

Proposed Projects Yellow Highlighter)

- Where do you most want to see fuels treatment occur? What types of treatments?
  - Shaded fuel breaks
  - Roadside brushing
  - Prescribed fire
- What other wildfire protection activities would you like to see implemented?
  - Water storage: tanks, ponds, pools (Blue dot w/yellow circle)
  - Education
  - Equipment
  - Road and address signs

Priorities: Which projects are your highest priority and why?
Now think about ownership, cost, effectiveness; what do you want to see happen soonest?

(The prioritization method is to take the total number of identified projects, divide it by 3, and give each participant that many sticky dots. Instruct participants to place one dot (only one vote per item) on each of their priority projects. Tally "votes," and number on flip chart in red. Then ID the top 3-5 vote getters as the top priorities for the group. The result will be a J-curve of the group's prioritization preferences.)

APPENDIX E:
HOME RISK ASSESSMENT

APPENDIX E: HOME RISK ASSESSMENT

HUMBOLDT COUNTY FIRE SAFE COUNCIL

HOME RISK ASSESSMENT:

ASSESS YOUR HOME'S ABILITY TO SURVIVE WILDFIRE[1]

Your home's potential for ignition – its chance of catching on fire – is determined by two primary factors:

(1) the presence of combustible materials within 100 feet of your home, and

(2) the ability of your home to resist air-borne embers.

This assessment will reveal your home's vulnerabilities to wildfire, helping you prepare to better protect your home.

Remember that if you don't have adequate defensible space around your home, the specific characteristics of your home may not matter!

For each item below, circle the number across from the description that best describes your home and property, or describe the actual situation and estimate a score. When you're done, you can total your scores and find out how your home rates. Low scores are excellent and indicate a low likelihood that your home would ignite under typical wildfire exposures.

This assessment focuses first on the specific characteristics of your home, then it follows with an assessment of the conditions surrounding your home. However, it's important to remember that if you don't have adequate defensible space around your home, the specific characteristics of your home may not matter! **The scoring used in this guide assumes that you have 100 feet of defensible space**.

While assessing your home and parcel, envision what it would take for your house to survive *without* firefighters present – a common situation during extreme wildfires. This is the premise of the first section of this assessment, which rates whether or not your home could survive on its own.

The second section of this assessment addresses firefighters' ability to protect your home. Low potential for ignition makes firefighters' work easier.

Additional information on protecting your home from wildfire can be found at www.extension.org/surviving_wildfire and www.disastersafety.org. There are also many resources available through University of California Cooperative Extension, including http://ucanr.org/sites/Wildfire/ and http://firecenter.berkeley.edu.

[1] Adapted from the Mendocino County Fire Safe Council's Wildfire Risk Assessment with editorial changes made by Stephen Quarles (UC Cooperative Extension Emeritus and IBHS Senior Scientist) and Yana Valachovic (UC Cooperative Extension), March 2012. The Mendocino Home Risk Assessment was originally created with the assistance of Jack Cohen, a research scientist with the U.S. Forest Service whose work on how homes ignite in wildfires is central to the national Firewise program and is the subject of the DVD called "Wildfire! Preventing Home Ignitions," available free from Firewise (see www.firewise.org).

PART 1: HELPING YOURSELF AND YOUR HOME

BUILDING MATERIALS AND CONSTRUCTION

Your home can survive a wildfire without the fire department's intervention, but only if it is built and maintained to resist ignition from (1) air-borne embers entering your house and/or accumulating on or near it, (2) direct contact with flames from ember-ignited combustible material very close to the home, and (3) radiant heat from nearby flames.

The primary cause of home loss to wildfire are the embers that ignite materials adjacent to the home or directly ignite a vulnerable part of the house, such as a wood shake roof.

1. ROOFTOP: *The roof is the most vulnerable part of a house, so it is the top priority!*

At my house…	***Score***
I have a fire-resistant roof covering in good condition (composition shingles, ceramic tile, metal, slate, etc.)	**0**
I have an untreated wood shake roof	**80**
Other:	Estimated score:

***Recommended action if needed**:*

- Replace wood shake roof with fire-rated roofing

2. EDGE OF ROOF VULNERABILITIES

2.1 ROOF TRANSITIONS: *Homes have a roof covering, and gaps can exist between the covering and the roof deck. These gaps can occur at the roof edge, at the ridge, or in valleys. (Rounded Spanish tiles that are not sealed are a common example of this).*

At my house…	***Score***
These gaps are sealed	**0**
There are gaps between roof deck and roof covering	**20**
Other:	Estimated score:

Recommended action if needed:

- Seal gaps between roof deck and roof covering

2.2 COMPLEX ROOF OBSERVATIONS: *The roof has protrusions, such as a chimney chase, dormers, roof offsets, etc.*

At my house…	***Score***
Roof is not complex or siding on protrusion consists of noncombustible materials (e.g., fiber cement, stucco or metal)	**0**
Siding on protrusion consists of combustible materials (e.g., wood or vinyl)	**20**
Other:	Estimated score:

Recommended action if needed:

- Look for accumulations of pine needles and dead leaves adjacent to these vertical components

- Replace siding on roof protrusions with noncombustible materials

2.3 GUTTERS: *A fire can begin in the gutters and enter the house, under the roof into the attic. Maintenance is critical.*

At my house…	*Score*
Rain gutters are cleaned regularly and free of dry needles or leaves	**0**
Metal angle flashing is present at roof edge	**0**
Rain gutters are full of pine needles and/or dead leaves	**10**
Vinyl or plastic rain gutter present	**10**
Other:	Estimated score:

Recommended action if needed:

- If not already present, add metal angle flashing at roof edge
- Clean gutters regularly to avoid buildups of dry leaves and pine needles

3. VENTS: *Hot embers can penetrate vents that are damaged or have screen openings larger than 1/8".*

At my house…	*Score*
All vents are covered with metal mesh with openings of 1/8" or less	**0**
All vents are covered with metal mesh with openings of 1/4" or greater	**30**
Other:	Estimated score:

Recommended action if needed:

- Ensure openings in metal mesh are 1/8" or less; replace metal mesh if needed

4. SIDING: *Embers can also penetrate through gaps in siding and at junctions between deck, walls, and fascia boards.*

At my house…	*Score*
I have noncombustible (for example, stucco or fiber cement) siding	**0**
I have combustible (wood, vinyl, or other plastic) siding	**15**
Other:	Estimated score:

Recommended action if needed:

- Replace siding with noncombustible materials

5. EAVES: *Embers can also penetrate open eaves*

At my house…	*Score*
The eaves are boxed in	**0**
The eaves are open (you can see the roof rafters or trusses on part of your roof overhanging the exterior wall)	**10**
Other:	Estimated score:

Recommended action if needed:

- Box-in your eaves to reduce vulnerability of your eaves to embers

6. WINDOWS: *Aside from the obvious vulnerability of an open window that can let in embers, radiant heat and/or direct flame contact can cause the glass in your window to break. Window screens will absorb radiant energy and can block entry of embers, providing some protection at your windows. Shutters will also provide protection from radiant heat and flames. Tempered glass, a requirement by code for all windows in a new home, provides substantially more protection from radiant heat than non-tempered (annealed) double-paned glass alone.*

At my house…	*Score*
All the windows and glass doors have double-paned glass	**0**
The windows have single-paned glass	**20**
Other:	Estimated score:

Recommended action if needed:

- Replace windows with tempered, double-paned glass
- Install screens or shutters for added protection

7. DECK AND PORCH: *Embers often land on or under the deck or porch, igniting combustible vegetation and other items stored on or under the deck.*

At my house…	*Score*
The deck or porch is free of leaves and needles, wood planter boxes, combustible decorations and doormats, lawn furniture with cushions, etc.	**0**
I have combustible items on my deck/porch all summer and am unlikely to be able to remove them if an evacuation occurs	**20**
My deck overhangs a steep slope	**20**
Other:	Estimated score:

Recommended action if needed:

- Keep deck/porch free of large accumulations of combustible materials (including areas under deck)

8. FIRE HAZARDS NEAR THE HOUSE: *In a wildfire, burning materials will produce embers that can catch buildings on fire. Anything combustible that is attached to the house—fences, decks, boardwalks, outbuildings, etc.—should be considered part of the house and given the same consideration as the house.*

At my house…	*Score*
All firewood, lumber, fuel tanks, chemicals, equipment, wood fences, sheds, and other combustible materials are at least 30 feet from my home	**0**
There is a wooden fence attached to my house	**5**
There are old sheds, barns and other buildings within 30' of my home	**20**
Firewood, lumber, tanks or other combustibles are adjacent to or under or on my deck or next to my house	**20**
Other:	Estimated score:

Recommended action if needed:

- Maintain defensible space around outbuildings, fuel storage containers, woodsheds, etc.

COMBUSTIBLE VEGETATION AND OTHER ITEMS NEAR THE HOME

Homes are frequently ignited by small surface fires in grass, weeds, and brush that are able to reach the house, or from embers that ignite vegetation adjacent to the house. Removing dead grass, weeds, brush, tree branches, and other combustible items near the house is crucial. ***A fire-safe landscape does not mean you need to cut down mature trees, remove all plants, and create a moonscape!*** *It means reducing the amount of combustible items near your home so that fire will not spread to your home, an attached fence, or a nearby outbuilding. The key concepts are:*

1. Keep clumps of plants, bushes, and other items horizontally separated from each other so if one clump is on fire, its heat and flames won't catch the next one on fire. For example, canopies of major trees should be separated by 20 feet or more. Canopies of shrubs should be separated by 10 feet or more. Keep your vegetation in separate islands, surrounded by less combustible areas or hardscape.

2. Keep fire from burning into tree and shrub canopies by preventing fire from spreading vertically. This can be done by (A) pruning lower branches and (B) removing most combustible vegetation beneath the trees or shrub. Dead vegetation must be removed from shrubs (half-dead junipers are especially combustible).

1. WITHIN 5 FEET OF THE HOUSE:

Within 5 feet of my house…	*Score*
Everything that is combustible is cleared, raked and away from this zone	**0**
Un-mowed dead grass, other dead vegetation, and combustible mulch materials surround my house	**40**
Other:	Estimated score:

Recommended action if needed:

- Clear dead vegetation and other combustible materials away from your house

2. WITHIN 30 FEET OF THE HOUSE:

Within 30 feet of my house…	*Score*
I have removed dead vegetation from this zone. The canopies of trees are well-spaced (e.g., 20 feet separating outside branches) and branches are pruned up to 8 feet. Dead grass has been mowed.	**0**
The dead grass is not mowed and dead shrubs are connected vertically and horizontally to other shrub and tree canopies.	**30**
Other:	Estimated score:

Recommended action if needed:

- Remove dead vegetation within 30 feet of your house.

3. WITHIN 30-100 FEET FROM THE HOUSE:

Within 30-100 feet of my house…	*Score*
Trees have at least 15 feet between canopies and branches pruned up to 8 feet. Dead branches and dead shrubs have been removed. Shrubs have 10 feet between canopies.	**0**

There are continuous shrubs and trees in this zone.	**20**
Other:	Estimated score:

Recommended action if needed:

- Prune trees and shrubs up to 8 feet. Remove dead plant material, and separate shrub and tree canopies.

TOPOGRAPHY/TERRAIN NEAR MY HOME

Fire burns more intensely uphill than downhill. All else being the same, a steeper slope will burn more intensely. Narrow canyons and gullies can channel the wind, resulting in higher intensity burning and ember generation.

1. My Home's Location Relative to Slopes Covered with Combustible Vegetation (if applicable):

My house is…	*Score*
Set back more than 30 ft from a steep upslope	**0**
Set back less than 30 ft from a steep upslope	**10**
Other:	Estimated score:

Recommended action if needed:

- If you are located on or near a steep slope, vegetation management (outlined above) is even more critical.

TOTAL POINTS FOR MY HOME:

_____

INTERPRETING YOUR HOME'S WILDFIRE RISK SCORE

These are estimates; a low score does not guarantee that your home will be safe.

Up to 35 points	=	Low Risk
35 to 60 points	=	Moderate Risk
65 to 95 points	=	High Risk
100 points or more	=	Extreme Risk

Concerned about your score? See where your risk points are highest. Start with your home itself, and work outward. Proper vent screens are perhaps your cheapest and easiest to accomplish. Although more costly, the most crucial step is to improve your roof to meet fire resistant standards. Maintenance and separation of vegetation from the home is essential. Every action you take will increase your safety from wildfire!

PART 2: HELPING FIREFIGHTERS HELP YOU

During a wildfire, vehicles will be leaving, and fire engines will be attempting to enter areas on the same road(s).

- *Will you be able to evacuate safely if necessary?*
- *Will fire engines be able to get to your home?*
- *Do you have room for fire engines to park and set up a save zone for them to work from? Fire engines may be 28' long, 10' wide, and 15' tall.*

If this assessment results in a score of 20 or greater, understand that your conditions would probably prevent fire engines from getting to your home. Work to improve these conditions. If you face these situations, contact your Fire Safe Council, CALFIRE and your local fire department for advice on what you should do before and during a fire to improve your safety[2].

Scores in this section are given to help you understand (1) your ability to evacuate safely and (2) what firefighters need. They do not relate directly to how your home will survive a wildfire unattended and should not be interpreted in the same way as your home score.

1. Number of Access Routes to my Home:

Where I live…	*Score*
There are two or more roads in and out of my area	**0**
I live on a long dead-end road	**15**
Other:	Estimated score:

2. Width of Roads to my Home:

Where I live…	*Score*
The roads are all two lanes -- 18 or more feet wide	**0**
The roads are between 10 and 18 feet wide	**10**
Some roads are less than 10 feet wide	**20**
Other:	Estimated score:

Recommended action if needed:

3. Existence of Turnouts for Passing on Single-lane Roads (if applicable):

Where I live…	*Score*
Turnouts are located every 400 feet and they are at least 10' wide x 80' long	**0**
There are some turnouts, but not to the standard above	**10**

[2] *Some of Humboldt County's remote rural fire departments have adapted to respond to residences located on long, narrow, dead-end, dirt roads and will make every efforts to respond to isolated locations. You can help them by having clear signs that identify roads and addresses; and marking water sources.*

The road has long, narrow sections with no turnouts	**20**
Other:	Estimated score:

Recommended action if needed:

4. RADIUS OF TURNS AND CURVES ON ROADS AND DRIVEWAY TO MY HOME:

Where I live…	***Score***
All turns and curves have at least a 50' radius (gentle curves)	**0**
Some turns and curves are too tight for a fire engine to make at all	**20**
Other:	Estimated score:

Recommended action if needed:

5. VERTICAL CLEARANCE ABOVE ROADS AND DRIVEWAYS:

Where I live…	***Score***
There is at least 15 vertical feet of clearance	**0**
There is 13-15 feet of clearance	**10**
There is less than 13 feet of clearance	**20**
Other:	Estimated score:

Recommended action if needed:

6. BRIDGES ON ROADS OR DRIVEWAYS: *A fire engine full of water can weigh 30,000+ pounds. If a bridge collapses, firefighters could be killed and evacuation routes cut off. If you are not sure about your bridge's strength, consult a structural engineer.*

Where I live…	***Score***
All bridges can hold 40,000 pounds and have signs posted that declare weight ratings	**0**
One or more bridges cannot hold that much weight	**20**
Other:	Estimated score:

Recommended action if needed:

7. ROOM FOR FIRE ENGINES TO MANEUVER:

Where I live…	***Score***
There's a circular driveway or large open area (40' x 40') near my home	**0**
There's a place to turn around that's at least 40' long and 15' wide	**5**
It would be difficult for fire engines to turn around near my home	**20**
Other:	Estimated score:

Recommended action if needed:

8. ROAD AND STREET SIGNS: *In a large wildfire, firefighters from other counties may arrive. They will not know our neighborhoods. If they are given your address number, will they be able to find you?*

Where I live…	*Score*
Signs are present at all road intersections; have reflective letters at least 3" tall, and are clearly visible in the dark in headlights	**0**
Signs are hard to read or are missing from some intersections	**15**
There are no road or street signs in my area	**20**
Other:	Estimated score:

Recommended action if needed:

9. MY HOUSE NUMBER SIGN:

Where I live…	*Score*
My house number is posted at the road, with reflective numbers at least 3" tall on a contrasting background, visible from 100' away in both directions	**0**
My sign is present but doesn't meet the above requirements	**10**
The address for my house is not posted on the road	**15**
Other:	Estimated score:

Recommended action if needed:

10. WATER SUPPLY: *Most wildland fire engines carry only 500 gallons of water. Having water that fire engines – or you— can find and tap into is critical in rural areas. Tanks or hydrants must have a discharge with a* ***male National Hose pipe thread fitting either 1½" or 2½" in diameter****. Your Fire Safe Council has detailed information on this subject.*

Where I live…	*Score*
A pressurized fire department hydrant is within 1,000' of my house	**0**
There is a fire department fitting on a standpipe (small hydrant) or a water tank with an appropriate pipe thread that can provide at least 500 gallons of water – and a blue reflector dot is posted at the driveway's entrance and a sign pointing firefighters to where that fitting and water supply are located	**0**
A pond, pool, or stream is near to the home, where a fire engine could safely park within 10 feet of the water's surface and pump from it	**0**
No water supply exists for firefighting	**15**
Other:	Estimated score:

Recommended action if needed:

TOTAL POINTS FOR MY HELPING FIREFIGHTERS:

_____

The higher your points, the more risky and complicated it will be for firefighters to defend your house from wildfire.

Other helpful resources can be found at the links below:

Home Landscaping for Fire (http://anrcatalog.ucdavis.edu/pdf/8228.pdf)

Home Survival in Wildfire Prone Areas: Building Materials and Design Considerations (http://anrcatalog.ucdavis.edu/pdf/8393.pdf)

www.firewise.org

www.firelab.org

www.fire.ca.gov

NOTES:

Home Risk Assessment for: _____

Summary of Landowner Goals:

General

_____
_____
_____
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_____
_____

Road Access/Escape

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Water Resources

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Structures

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Fire Hazard Priorities

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Other

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_____

APPENDIX F:
COUNTY FIRE SAFE REGULATIONS

FIRE SAFE REGULATIONS

TITLE III - LAND USE AND DEVELOPMENT---DIVISION 11

CHAPTER 1

ADMINISTRATION

3111-1. TITLE.

These regulations shall be known as the "SRA Fire Safe Regulations" and shall constitute the basic wildland fire protection standards of the County for lands within State Responsibility Areas (SRA).

3111-2. PURPOSE.

These regulations have been prepared and adopted for the purpose of establishing minimum wildfire protection standards in conjunction with building, construction and development in SRA. These regulations constitute local alternative standards as authorized by Section 4290 of the Public Resources Code. The future design and construction of structures, subdivisions and developments in SRA shall provide for basic emergency access and perimeter wildfire protection measures as specified in the following sections. These measures shall provide for emergency access; signing and building numbering; private water supply reserves for emergency fire use; and vegetation modification. The fire protection standards which follow shall specify the minimums for such measures.

3111-3. SCOPE.

(a) These regulations shall apply as appropriate to all of the following activities which are approved in the SRA after January 1, 1992:

(1) the creation of new parcels, excluding lot line adjustments as specified in Government Code (GC) Section 66412(d);

(2) new construction, not relating to an existing structure, which requires a building permit;

(3) land use or development which requires a use permit;

(4) the siting of manufactured homes; and

(5) new road construction, including construction of a road that does not currently exist, or an extension of an existing road.

(b) Notwithstanding paragraph (a) of this section, these regulations shall not apply to:

(1) enlargement, alteration, repair or improvement of any building or structure existing on the effective date of these regulations;

(2) new construction of accessory structures where the main building exists on the effective date of these regulations;

(3) land use or development which requires a use permit where the Planning Director and CDF determines that no increase in fire risk would result from the use or activity;

(4) roads required as a condition of tentative parcel or final maps prior to the effective date of these regulations; roads for agricultural or mining use solely on one ownership; and roads use solely for the management and harvesting of wood products; and

(5) repair or maintenance of any road, street or private lane existing on the effective date of these regulations.

3111-4. PROVISIONS FOR APPLICATION OF THESE REGULATIONS.

These regulations shall be applied as follows:

(a) The County shall provide the local California Department of Forestry and Fire Protection (CDF) Ranger Unit with notice of applications for building permits (where exceptions are requested), tentative parcel maps, tentative maps, and use permits for construction or development within SRA.

The County need not provide CDF with notice of applications for building permits if the County determines that the permit complies with County ordinance and no exceptions from these regulations are required.

(b) The County shall request CDF to review and make fire protection recommendations on applicable construction or development permits or maps provided by the County. CDF shall respond within thirty (30) days of the referral.

(c) The County shall ensure that the applicable sections of this ordinance become a condition of approval of any applicable construction or development permit or map.

(d) The application of these regulations shall be confined to the real property that is the subject of the building permit or other grant of land use or development approval by the County, unless otherwise stated.

Nothing contained in these regulations shall be considered as abrogating the provisions of any ordinance, rule or regulation of the state or county, including the provisions of the California Environmental Quality Act (CEQA), which may require the evaluation and mitigation of potential impacts of the project beyond the limits of the real property that is the subject of the building permit or other grant of land use or development approval before the County.

3111-5. INSPECTION AUTHORITY.

(a) Inspection shall be made pursuant to Section 6 by:

(1) the Planning Director or his/her designee, or

(2) the Director of the California Department of Forestry and Fire Protection (CDF) of his/her designee.

(b) The County shall report violations of these regulations to the CDF Ranger Unit headquarters with responsibility for SRA fire protection for the County.

3111-6. INSPECTIONS.

(a) The inspection authority may inspect for compliance with these regulations. When conducted, inspections should occur prior to the following events:

(1) issuance of a use permit;

(2) issuance of a Certificate of Occupancy under a building permit;

(3) recordation of a parcel or final map for a subdivision;

(4) filing of a notice of completion (other than for a building permit); or

(5) final inspection of any project or building permit.

(b) It shall be the duty of the holder of the building permit or other permit or map approval issued by the County to notify the County, or CDF, as appropriate, that the construction and/or improvement required under these regulations is ready for inspection and to assure that the premises will be accessible at the time scheduled for inspection. Inspections shall be requested by the applicant at least forty-eight (48) hours in advance of the intended inspection.

(c) The inspection authority shall notify or inform the permit holder of the day during which the inspection is to be conducted and shall attempt to notify the permit holder if the inspection cannot be made as scheduled.

(d) Annual inspection conducted by CDF pursuant to Public Resource Code Section 4290 and 4291 shall to the extent practical include notification as provided in paragraph (c) of this section for inspections which focus on individual parcels and by public notice for area-wide inspections.

3111-7 EXCEPTIONS - INTENT.

The County seeks to protect the intent of the State Fire Safe Regulations while ensuring that no undue hardship occurs at the county level due to conditions peculiar to the County. The exceptions procedure is provided with the intent of ensuring that every individual who is negatively impacted will get a fair hearing before local authorities who are competent to judge the legitimacy of that individual's concerns. The local inspection authority together with the local representative of CDF is therefore directed to deal with requests for exceptions to the provisions of these regulations on a case by case basis, making a comprehensive review of the circumstances in each case, taking special note of such factors as:

(a) community standards as expressed in the County' Alternative Owner Building Ordinance; and

(b) economic factors which may affect the affordability of housing as described in the Housing Element of the County's General Plan.

3111-8. EXCEPTIONS TO STANDARDS.

Upon request by the applicant, exceptions to standards within this ordinance and mitigated practices shall be allowed by the inspection authority, where the exception provides the same overall practical effect as these regulations towards providing defensible space. In evaluating requests for exceptions to standards, the inspection authority shall be guided by Section 3111-7 of these regulations (Intent).

3111-9. REQUESTS FOR EXCEPTIONS.

(a) An applicant may apply to the Planning Director for an exception to the standards within this ordinance. The application for an exception shall be accompanied by such information as the Planning Department requires and by a fee established by the Board of Supervisors. At minimum, the application shall contain the following information:

(1) a description of the specific section(s) for which an exception is requested,

(2) material facts supporting the contention of the applicant,

(3) details of the exception or mitigation measures proposed, and

(4) a map showing the proposed location and siting of the exception or mitigation measure(s).

(b) The Planning Director shall request the California Department of Forestry and Fire Protection (CDF) to review the exception request. CDF shall respond within thirty (30) days of the referral with documentation outlining the effects of the requested exception on wildland fire protection. If CDF does not respond within the time provided, the Planning Director shall assume that CDF supports the exception. The Planning Director shall not approve an exception request of the recommendation from CDF is for denial.

(c) The Planning Director shall give written notice of his/her decision to the applicant. Notice shall also be given to any parties requesting such notice and to CDF.

3111-10. APPEALS.

(a) Any person aggrieved by the decision of the Planning Director may appeal to the Board of Supervisors. The appeal shall be filed with the Planning Department within ten (10) days of the date of the notice and shall be accompanied by a written statement of the reasons why the decision was in error and by a fee established by the Board of Supervisors.

(b) The Board of Supervisors shall consider the appeal at the earliest possible date. The decision of the Board of Supervisors is final and binding.

(c) If an appeal is granted, the Board of Supervisors shall make findings that the decision meets the intent of providing defensible space consistent with these regulations. Such findings shall include reasons for the decision.

(d) A written copy of the findings adopted under paragraph (c) above shall be provided to the CDF Ranger Unit headquarters that administers SRA fire protection in the County.

3111-11. DEFINITIONS.

Unless the context otherwise requires, the definitions set out in this ordinance shall be used in the interpretation and construction of these regulations. Words used in the present tense shall include the future tense, and in the future tense shall include the present tense; the singular number shall include the plural number, and the plural shall include the singular.

Abatement: For the purpose of this ordinance means the restoration of the specific measure(s) or mitigation required as a condition of the permit, parcel or map approval pursuant to these regulations.

Accessory building: Any building used as an accessory to residential, Commercial, recreational, industrial, or educational purposes as defined in the California Building Code, 1989 Amendments, Chapter 11, Group M, Division 1, Occupancy that requires a building permit.

Agriculture: Land used for agricultural uses as defined in Humboldt County Code Section 312-6.

Board: The Humboldt County Board of Supervisors.

Building: Any structure used or intended for supporting or sheltering any use or occupancy that is defined in the California Building Code, 1989 Amendments, Chapter 11, except Group M, Division 1, Occupancy.

For the purpose of the ordinance, building includes mobile homes and manufactured homes, churches, and day care facilities.

California Environmental Quality Act (CEQA): Means the California Environmental Quality Act, California Public Resources Code Section 21000 et seq.

CDF: California Department of Forestry and Fire Protection.

County: The County of Humboldt.

Dead-end road: A road that has only one point of vehicular ingress/egress, including cul-de-sacs and looped roads.

Defensible space: The area within the perimeter of a parcel, development, neighborhood or community where basic wildland fire protection practices and measures are implemented, providing the key point of defense from an approaching wildfire or defense against encroaching wildfires or escaping structure fires. The perimeter used in this regulation is the area encompassing the parcel or parcels proposed for construction and/or development, excluding the physical structure itself. The area is characterized by the establishment and maintenance of emergency vehicle access, emergency water reserves, street names and building identification, and fuel modification measures.

Development: As defined in Section 66418.1 of the California Government Code.

Director of Public Works: The Director of the Department of Public Works or his/her designee.

Driveway: A vehicular access that serves no more than two buildings, with no more than three dwelling units on a single parcel, and any number of accessory buildings.

Dwelling unit: Any building or portion thereof which contains living facilities, including provisions for sleeping, eating, cooking and/or sanitation for not more than one family.

Exception: An alternative to the specified standard requested by the applicant that may be necessary due to health, safety, environmental conditions, physical site limitations or other limiting conditions such as recorded historical sites, that provides mitigation of the problem.

Fire valve: See hydrant.

Fuel modification area: An area where the volume of flammable vegetation has been reduced, providing reduced fire intensity and duration.

Greenbelts: A facility or land-use, designed for a use other than fire protection, which will slow or resist the spread of a wildfire. Includes parking lots, irrigated or landscaped areas, golf courses, parks, playgrounds, maintained vineyards, orchards or annual crops that do not cure in the field.

Hammerhead/T: A roadway that provides a "T" shaped, three-point turnaround space for emergency equipment, being no narrower than the road that serves it.

Hydrant: A valved connection on a water supply/storage system, having at least one 2-1/2 inch outlet, with male American National Fire Hose Screw Threads (NH) used to supply fire apparatus and hose with water.

Local fire agency: A local fire organization recognized by the County Local Agency Formation Commission (LAFCO) which has shared responsibility on SRA lands.

Manufactured home: As defined in California Health and Safety Code Sections 18007, 18008, and 199791.

Occupancy: The purpose for which a building, or part thereof, is used or intended to be used.

One-way road: A minimum of one traffic land width designed for traffic flow in one direction only.

Planning Director: Director of the Planning and Building Department or his/her designee.

Roads, streets, private lanes: Vehicular access to more than one parcel; access to any industrial or commercial occupancy; or vehicular access to a single parcel with more than two buildings or four or more dwellings units.

Roadway: Any surface designed, improved, or ordinarily used for vehicle travel.

Roadway structures: Bridges, culverts, and other appurtenant structures which supplement the roadway bed or shoulders.

Same practical effect: As used in this ordinance, means an exception or alternative with the capability of applying accepted wildland fire suppression strategies and tactics, and provisions for firefighter safety, including:

(a) access for emergency wildland fire equipment,

(b) safe civilian evacuation,

(c) signing that avoids delays in emergency equipment response,

(d) available and accessible water to effectively attack wildfire or defend a structure from wildfire, and

(e) fuel modification sufficient for civilian and firefighter safety.

Shoulder: Roadbed or surface adjacent to the traffic lane.

State Board of Forestry (SBOF): A nine member board, appointed by the Governor, which is responsible for developing the general forest policy of the state, for determining the guidance policies of the Department of Forestry and Fire Protection, and for representing the state's interest in federal land in California.

State Responsibility Area (SRA): As defined in Public Resources Code Sections 4126-4127; and the California Code of Regulations, Title 14, Division 1.5, Chapter 7, Article 1, Sections 1220-1220.5.

Structure: That which is built or constructed, an edifice or building of any kind, or any piece of work artificially built up or composed or parts joined together in some definite manner.

Subdivision: As defined in Section 66424 of the California Government Code.

Traffic lane: The portion of the roadway that provides a single line of vehicle travel.

Turnaround: A roadway, unobstructed by parking, which allows for a safe opposite change of direction for emergency equipment. Design of such area may be a hammerhead/T or terminus bulb.

Turnouts: A widening in a roadway to allow vehicles to pass.

Vertical clearance: The minimum specified height of a bridge or overhead projection above the roadway.

Wildfire: As defined in California Public Resources Code Sections 4103 and 4104.

3111-12. DISTANCE MEASUREMENTS.

All specified or referenced distances are measured along the ground surface, unless otherwise stated.

3111-13. MAINTENANCE OF DEFENSIBLE SPACE MEASURES.

(a) To ensure continued maintenance of properties in conformance with these standards and measures and to assure continued availability, access, and utilization of the defensible space provided for in these standards during a wildfire, provisions for annual maintenance shall be included in the development plans and/or shall be provided as a condition of approving any activity subject to these regulations. Provisions deemed to satisfy this requirement include but are not limited to:

(1) establishment of a County Service Area (CSA) for the subdivision prior to map recordation;

(2) development of a binding maintenance association or similar agreement between affected property owners formed for the subdivision prior to map recordation;

(3) recordation of binding Covenants, Conditions, and Restrictions (CC&R) for maintenance of individual measures which are enforceable against the property; or

(4) recordation of a Notice of Requirement for Maintenance against the real property by the County prior to issuance of a building permit or as a condition of a initiating a use authorized under a use permit.

(b) The inspection authority may conduct inspections to ensure compliance with the standards as set forth in the development plans and/or conditions of permit, parcel or map approval. Inspections should be conducted in accordance with Section 3111-6, paragraph (d) of these regulations. Violation of these regulations shall be subject to the penalties as set forth in Section 3116-1 of this ordinance.

CHAPTER 2

EMERGENCY ACCESS

3112-1. ROAD AND DRIVEWAY ACCESS - INTENT.

Road and street networks, whether public or private, unless exempted under Section 3111-3(b), shall provide for safe access for emergency wildland fire equipment and civilian evacuation concurrently, and shall provide unobstructed traffic circulation during a wildfire emergency consistent with Section 3112-2 through 3112-13.

3112-2. APPLICATION OF DESIGN STANDARDS.

The design and improvement standards as referenced in these regulations shall be those as set forth in the Appendix to Title III, Division 2, of the Humboldt County Code, and in the County Roadway Design Manual. Application of these design and improvement standards shall be consistent with the intent as prescribed in Section 3112-1, and shall be based upon:

(a) legal requirements,

(b) sound engineering principles and practices and engineering geological evaluation of necessary,

(c) traffic safety considerations,

(d) economy of design and maintenance, and

(e) allowance for the special nature of Humboldt County roads and traffic problems.

Interpretation of these standards shall be provided by the Director of Public Works.

3112-3.ROAD WIDTH.

All roads shall be constructed to a minimum Road Category 4 road standard for traveled way (18-20 feet), except as provided herein.

(a) A traveled way meeting the standard for Road Category 2 (12 feet) shall be considered as meeting the requirements of this section for a single lot division into two (2) parcels, where all the following conditions are met:

(1) The subdivision is conditioned so as to limit site development as follows:

For a parcel or parcels having a minimum parcel size of less than 20 acres, not more than one (1) dwelling unit shall be permitted for each parcel.

For a parcel or parcels having a minimum parcel size of 20 acres or more, not more than two (2) dwelling units shall be permitted for each parcel.

(2) Rights to further subdivide the parcels created by the land division would be conveyed to the county until such time as the full road segment was improved to a minimum of Road Category 3 or 4 for traveled way, as appropriate.

(3) Inter-visible turnouts are installed in conformance Section 3112-8 of these regulations.

(b) A traveled way meeting the standard for Road Category 3 (16 feet) shall be considered as meeting the requirements of this section for subdivisions of three (3) to eight (8) parcels, where all the following conditions are met:

(1) The subdivision is conditioned so as to limit site development as follows:

For a parcel or parcels having a minimum parcel size of less than 20 acres, not more than one (1) dwelling unit shall be permitted for each parcel.

For a parcel or parcels having minimum parcel size of 20 acres, not more than two (2) dwelling units shall be permitted for each parcel.

(2) Rights to further subdivide the parcels created by the subdivision would be conveyed to the County until such time as the full road segment was improved to a minimum of Road Category 4 for traveled way.

(3) The roadbed width shall include a minimum of two-foot (2') wide bladed shoulders on each side of the traveled way.

(c) A traveled way meeting the standard for Road Category 3 (16 feet) shall be considered as meeting the requirements of this section for subdivisions of not more than nineteen (19) parcels, where all the following conditions are met:

(1) The requirements of Section 3112-3(b) are satisfied.

(2) The minimum parcel size for the subdivision is forty (40) acres or larger.

3112-4. ROADWAY SURFACE.

The surface of all roadways shall provide unobstructed access to conventional drive vehicles, including sedans and fire engines. The surface shall conform to the standards of a Road Category 4 roadway. Where Road Category 2 or 3 has been approved pursuant to Section 312-3, the surface shall conform to the standards for these categories, as appropriate.

3112-5. ROADWAY GRADES.

The grade for all roads, streets, and private lanes shall conform to the standards for Road Category 4. The grade for driveways shall conform to the standards for Road Category 1. No roadway grade in excess of 16 percent shall be permitted unless it has been demonstrated to be in conformance with the County Roadway Design Manual.

3112-6. ROADWAY RADIUS.

(a) The roadway radius for all roads, and private lanes shall conform to the standards for Road Category 4. The minimum roadway radius for driveways shall conform to the standards for Road Category 1. No roadway shall have a horizontal inside radius of curvature of less than 50 feet unless it has been demonstrated to be in conformance with the County Roadway Design Manual.

(b) Curve alignments shall provide for curve widening on low radius curves to compensate for off tracking characteristics or trucks and trailers. Additional surface width of four (4) feet shall be added to curves of 50-100 feet radius; two (2) feet to those from 100-200 feet. Design of curve alignments shall be in conformance with the County Design Manual.

(c) The length of vertical curves in roadways, exclusive of gutters, ditches, and drainage structures designed to hold or divert water, shall not be less than 100 feet. Design of vertical curves shall be in conformance with the County Roadway Design Manual.

3112-7. ROADWAY TURNAROUNDS.

Turnarounds are required on driveways and dead-end roads as specified in these regulations. The minimum turning radius for a turnaround shall be 40 feet from the center line of the road. If a hammerhead/T is used, the top of the "T" shall be a minimum of 60 feet in length.

3112-8. ROADWAY TURNOUTS.

Turnouts shall be designed in conformance with the County Roadway Design Manual. Turnouts shall be required on roadways constructed to the standard of Road Category 2 and at locations as specified in these regulations. Turnouts shall be a minimum of 10 feet wide and 80 feet long with a minimum of 25 foot taper on each end.

3112-9. ROADWAY STRUCTURES.

(a) All driveway, road, street, and private lane roadway structures shall be constructed to carry at least the maximum load and provide the minimum vertical clearance as required in California Vehicle Code Sections 35550, 35750, and 35250. All roadway structures shall be designed in conformance with the County Roadway Design Manual. The minimum vertical clearance shall be 15 feet at all points on the surface of the roadway.

(b) Appropriate signing, including but not limited to weight or vertical clearance limitations, one-way road or single lane conditions, shall reflect the capability of each bridge. This requirement may be omitted for bridges on private roads and driveways where compliance with paragraph (a) of this section has been demonstrated to the satisfaction of the Director of Public Works.

(c) A bridge with only one traffic lane may be authorized by the County; however, the bridge shall provide for unobstructed visibility from one end to the other and shall have intervisible turnouts at both ends.

(d) The County may allow a flatcar bridge having a width of not less than nine (9) feet to be used as a roadway structure on a private lane or driveway provided the requirements of Section 3112-9(c) are satisfied. No exception request shall be required for the reduced roadway width.

3112-10. ONE-WAY ROADS.

All one-way roads shall be constructed to provide a minimum of one 10-foot traffic lane. The County may approve one-way roads. All one-way roads shall connect to a two-lane roadway at both ends, and shall provide access to an area currently zoned for no more than 10 dwelling units. In no case shall it exceed 2640 feet in length. A turnout shall be placed approximately at the midpoint of each one-way road.

3112-11. DEAD-END ROADS.

(a) The maximum length of a dead-end road, including all dead-end roads accessed from that dead-end road, shall not exceed the following cumulative lengths, regardless of the number of parcels served:

parcels zoned for less than one acre	800 feet
parcels zoned for 1 acre to 4.99 acres	1350 feet
parcels zoned for 5 acres to 19.99 acres	2640 feet
parcels zoned for 20 acres to 39.99 acres	5280 feet
parcels zoned for 40 acres to 159.99 acres	7500 feet
parcels zoned for 160 acres or larger	Unlimited

All lengths shall be measured from the edge of the roadway surface at the intersection that begins the road to the end of the road surface at its farthest point. Where a dead-end road crosses areas of differing zoned parcel sizes, requiring different length limits, the shortest allowable length shall apply.

(b) Where parcels are zoned 5 acres or larger, turnarounds shall be provided at a maximum of 1320 foot intervals.

(c) Each dead-end road shall have a turnaround constructed at its terminus.

3112-12. DRIVEWAYS.

(a) All driveways shall be constructed to a minimum Road Category 1 standard. Driveways shall have a minimum 10 foot traffic lane and an unobstructed vertical clearance of 15 feet along its entire length. Driveways in excess of 1320 feet in length shall be constructed to the standard for Road Category 2.

(b) Driveways exceeding 150 feet in length, but less than 800 feet in length, shall provide a turnout near the midpoint of the driveway. Where a driveway exceeds 800 feet, turnouts shall be spaced at intervisible points at approximately 400 foot intervals. The location and spacing of turnouts shall be in conformance with the County Roadway Design Manual.

(c) A turnaround shall be provided at all building sites on driveways over 300 feet in length, or 200 feet if required by the local fire agency, and shall be within 50 feet of the building.

3112-13. GATE ENTRANCES.

(a) Gate entrances shall be at least two feet wider than the width of the traffic lane(s) serving the gate.

(b) All gates providing access from a road to a driveway shall either:

(1) be located a minimum of thirty (30) feet from the roadway, or

(2) if located closer than thirty (30) feet from the roadway, turnout(s) shall be constructed near the gate entrance to allow parking next to the traffic lane(s) for use from each direction of travel. The location of the turnouts shall permit safe turning movements and maintain adequate sight visibility.

(c) All gates providing access from a road to a driveway shall open to allow a vehicle to stop without obstructing traffic on that road.

(d) Where a one-way road with a single traffic lane provides access to a gated entrance, a 40 foot turning radius shall be used.

CHAPTER 3

SIGNING AND BUILDING NUMBERING

3113-1. SIGNING AND BUILDING NUMBERING - INTENT.

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

3113-2. SIZE OF LETTERS, NUMBERS AND SYMBOLS FOR STREET AND ROAD SIGNS.

Notwithstanding any other provisions of the Code, the size of letter, numbers, and symbols for street and road signs shall be a minimum 3 inch letter height, 3/8 inch stroke, contrasting with the background color of the sign. Street and road signs located at an intersection with a County maintained roadway, or on roads where the traveled speed is greater than 30 miles per hour, shall be reflectorized. Wooden street and road signs meeting the standards for letter height, stroke, and contrast shall be permitted in all locations where reflectorized signs are not required by these regulations.

3113-3. VISIBILITY AND LEGIBILITY OF STREET AND ROAD SIGNS.

Street and road signs shall be visible from both directions of vehicle travel for a distance of at least 100 feet.

3113-4. HEIGHT OF STREET AND ROAD SIGNS.

Height of street and road signs shall be uniform county wide, and meet the visibility and legibility standards of these regulations.

3113-5. NAMES AND NUMBERS ON STREET AND ROAD SIGNS.

Newly constructed or approved public and private roads and streets must be identified by a name or number consistent with the Uniform Numbering System as set forth in Humboldt County Code Sections 442-1 through 441-11. All signs shall be mounted and oriented in a uniform manner.

3113-6. INTERSECTING ROADS, STREETS AND PRIVATE LANES.

Signs required by these regulations identifying intersecting roads, streets and private lanes shall be placed at the intersection of those roads, streets, and/or private lanes.

3113-7. SIGNS IDENTIFYING TRAFFIC ACCESS LIMITATIONS.

A sign identifying access flow limitation, including but not limited to weight or vertical clearance limitations, dead-end road, one way road or single lane conditions, shall be placed:

(a) at the intersection preceding the traffic access limitation, and

(b) no more than 100 feet before such traffic access limitation.

3113-8. INSTALLATION OF ROAD, STREET AND PRIVATE LANE SIGNS.

Road, street and private lanes signs required by these regulations shall be installed prior to final acceptance by the County of road improvements.

3113-9. ADDRESSES FOR BUILDINGS.

All buildings shall be issued an address in accordance with the County Uniform Numbering System, Humboldt County Code Section 442 et seq. Accessory buildings will not be required to have a separate address; however, each dwelling unit within a building shall be separately identified.

3113-10. SIZE OF LETTERS, NUMBERS AND SYMBOLS.

Notwithstanding Humboldt County Code Section 442-1, the size of letters numbers and symbols for addresses shall be a minimum 3 inch letter height, 3/8 inch stroke, contrasting with the background color of the sign. Address for buildings located at the driveway entrance onto a County maintained roadway, or on roads where the traveled speed is greater than 30 miles per hour, shall be reflectorized. Wooden address signs meeting the standards for letter height, stroke, and contrast shall be permitted in all locations where reflectorized signs are not required by this section.

3113-11. INSTALLATION, LOCATION AND VISIBILITY OF ADDRESSES.

(a) All buildings shall have a permanently posted address, which shall be placed at each driveway entrance and visible from both directions of travel along the road. In all cases, the address shall be posted at the beginning of construction and shall be maintained thereafter, and the address shall be visible and legible from the road on which the address is located.

(b) Address signs along one-way roads shall be visible from both the intended direction of travel and the opposite direction.

(c) Where multiple addresses are required at a single driveway, they shall be mounted on a single post.

(d) Where a roadway provides access and to a single commercial or industrial business, the address sign shall be placed at the nearest road intersection providing access to that site.

CHAPTER 4

EMERGENCY WATER STANDARDS

3114-1. WATER STANDARDS - INTENT.

Emergency water for wildfire protection shall be available and accessible in quantities and locations specified in statute and these regulations, in order to attack a wildfire and defend property from a wildfire. Such emergency water may be provided in a fire agency mobile water tender, or naturally occurring or manmade containment structure, as long as the specified quantity is immediately available.

3114-2. APPLICATION.

The provisions of this chapter shall apply when new parcels are approved by the County. The emergency water system shall be available on-site prior to or prior to the completion of building construction, where and individual system is approved. A water source on an adjacent parcel for which the subject property has access by means of a recorded easement shall be accepted as meeting the intent of this section.

3114-3. GENERAL STANDARDS.

A water system that meets or exceeds any of the following standards shall be accepted as meeting the requirements of these regulations:

(a) Public Utilities Commission of California (PUC) revised General Order #103, adopted June 12, 1956 (Corrected September 7, 1983, Decision 83-09-001), Section VIII Fire Protection Standards and other applicable sections relating to fire protection water delivery systems,

(b) Static water systems equaling or exceeding the National Fire Protection Association (NFPA) Standard 1231, "Standard on Water Supplies for Suburban and Rural Fire Fighting", 1981 Edition, or

(c) Mobile water systems that meet the Insurance Services Office (ISO) Rural Class 8, 2nd Edition 3-80, standard.

(d) Notwithstanding the above water system standards, a water system serving an individual residential dwelling which meets the 2.500 gallon emergency water supply requirements of the County's Alternative Owner Builder Ordinance, Humboldt County Code Section 331.5-13(h), and which conforms to the minimum pipe size and valving requirements set forth in these regulations, shall be accepted as meeting the requirements of this section.

Nothing in these regulations prohibits the combined storage of emergency wildfire and structural firefighting water supplies unless so prohibited by local ordinance or specified by the local fire agency.

Where freeze protection is required by the County, such measures shall be provided.

3114-4. HYDRANT/FIRE VALVE.

(a) The hydrant or fire valve shall be 18 inches above grade, eight (8) feet from flammable vegetation, no closer than four (4) feet nor farther than 12 feet from a roadway, and in a location where fire apparatus using it will not block the roadway.

The hydrant serving any building shall:

(1) be not less than 50 feet nor more than 1/2 mile from the building it is to serve, except that a hydrant serving any building on a lot less than ten (10) acres in acre shall be located within 500 feet of the building; provided that the local fire agency may allow a hydrant to be located up to 1000 feet from the building when site conditions warrant.

(2) be located at a turnout or turnaround, along the driveway to that building or along the road that intersects with that driveway.

(b) The hydrant head shall be brass or other corrosion resistent material with 2-1/2 inch National Hose male thread with a cap for pressure and gravity flow systems, and for draft systems, where applicable. Crash protection meeting the requirements of the Uniform Mechanical Code shall be installed when required by the County.

(c) All pipes supplying water to hydrants must be at least 3 inches in diameter; however, a pipe having a diameter of less than 3 inches may be used provided it can demonstrate the capability of supplying a minimum 200 gallon per minute (gpm) flow from the hydrant connection.

3114-5. SIGNING OF WATER SOURCES.

Each hydrant/fire valve or access to water shall be identified as follows:

(a) if located along a driveway, except where the residence is served with an individual water supply, a wooden sign with a minimum 3 inch letter height, 3/8 inch stroke, contrasting with the background color of the sign, with the wording "FIRE WATER" mounted on a wooden post or compliance with section (a) above shall be acceptable, or

(c) if located along a street or road,

(1) a reflectorized blue marker, with a minimum dimension of 3 inches, shall be mounted on a fire retardant post. The sign post shall be within 3 feet of said hydrant/fire valve, with the sign no less than 3 feet nor greater than 5 feet above the ground, in a horizontal position and visible from the roadway, or

(2) as specified in the State Fire Marshall's Guidelines for Hydrant Markings Along State Highways and Freeways, May 1988.

CHAPTER 5

FUEL MODIFICATION STANDARDS

3115-1. FUEL MODIFICATION - INTENT.

To reduce the intensity of wildfire by reducing the volume and density of flammable vegetation, the strategic siting of fuel modification and greenbelts shall provide (1) increased safety for emergency fire equipment and evacuating civilians; and (2) a point of attack or defense from a wildfire.

3115-2. SETBACK FOR STRUCTURE DEFENSIBLE SPACE.

(a) Notwithstanding other provisions of this Code, all parcels one (1) acre and larger shall provide a minimum 30 foot setback for buildings and accessory buildings from all property lines and/or the center of a road, except as provided herein:

(1) a building or accessory building may be located closer than 30 foot to a property line where a maintenance and open space easement for the benefit of the subject parcel has been recorded over the adjoining lot. The extent of the adjustment shall be no greater than the width of the easement, and no exception from minimum setbacks as specified in other provisions of this Code are granted pursuant to this section.

(2) a detached accessory building may be located within the 30 foot setback when it is constructed using non-combustible or fire resistive materials, and is located not closer than 20 feet to another building.

The required specific distance between buildings or structures and property lines or the centerline of the road shall be measured perpendicularly in a horizontal plane extending across the complete length of said property line or lines and/or roadway.

(b) For parcels less than one (1) acre, the County shall provide for the same practical effect

Methods of achieving the "same practical effect" include but are not limited to:

(1) development of a community water system meeting the specifications as set forth in Section 3114-3 (a-c);

(2) establishment of a County Service Area or other acceptable form of district or association to provide maintenance of defensible space measures, including vegetation modification;

(3) use of non-combustible or fire-resistive materials in construction of buildings or installation of sprinklers within buildings;

(4) development of greenbelts in strategic locations around the subdivision or parcels; or

(5) road development which provides for travel lanes and parking lanes that exceed the minimum requirements of these regulations.

3115-3. DISPOSAL OF FLAMMABLE VEGETATION AND FUELS.

Disposal, including chipping, burying, burning or removal to a landfill site approved by the County, of flammable vegetation and fuels caused by site development and construction, road and driveway construction, and fuel modification shall be completed prior to completion of road construction or final inspection of a building permit or initiation of a use under a use permit.

3115-4. GREENBELTS.

Subdivisions and other developments, which propose greenbelts as a part of the development plan, shall locate said greenbelts strategically, as a separation between wildland fuels and structures. The locations shall be approved by the inspection authority.

CHAPTER 6

ENFORCEMENT

3116-1. VIOLATION.

The following provisions shall apply to violations of the regulations as contained in this ordinance. All of the remedies provided for in this section shall be cumulative and no inclusive.

(a) Penalty. Any person, whether principal, agent, employee or otherwise, violating or causing or permitting the violation of any of the provisions of this Code shall be guilty of a misdemeanor and shall be subject to the penalties provided for in Section 112-5 of the Humboldt County Code.

(b) Public Nuisance. Any new development operated or maintained contrary to the provisions of this Code shall be the same hereby is declared to be a public nuisance and shall be subject to injunction and abatement as such.

APPENDIX G:
DESCRIPTIVE CHARACTERISTICS FOR COMMUNITY-IDENTIFIED PROJECTS MATRIX

APPENDIX G: DESCRIPTIVE CHARACTERISTICS FOR COMMUNITY-IDENTIFIED PROJECTS MATRIX

This document acts as a key for interpreting data portrayed within the "Community-Identified Projects" maps and matrices included in most of the thirteen Planning Unit Action Plans in Part IV of this CWPP. The data in these maps and matrices was procured through mapping exercises involving local residents attending community workshops held within each Planning Unit for the purposes of this CWPP. The information was then catalogued and mapped within the aforementioned matrices and maps by Humboldt County Planning and Building staff.

The following descriptions help decipher the meaning of each data column displayed in the Community-Identified Projects Matrices:

Map ID # - This identification number is the number that was assigned to the feature. The number corresponds to the mapped illustration of the proposed fuels treatment or mitigation action.

Location – The location identifies the community, access route, neighborhood, structure, or area at risk to wildfire.

Description – This is where a longer description of the proposed activity or past accomplishment is included.

Type – Areas in need of treatment or mitigation action are identified as one of the following four types:

- Roadside Clearance – Involve treating vegetation along driveways and roads and other key transportation corridors.
- Defensible Space – Involve treating vegetation in the 100 foot zone around homes and structures.
- Landscape - Involve treating vegetation in wildland areas beyond the immediate vicinity of structures.
- Other – Some action other than vegetation treatment. Often this designation would be accompanied by a descriptive word or words such as "Water" or "Access Improvement".

Status - The status of the proposed treatment or action is identified as one of the following:

- Treatment needed –Medium priority (Treat-Med)
- Treatment needed - High priority (Treat-High)
- Action needed (Action Need)
- Funded
- Initiated
-
- Treated

Year – Identifies what year the treatment or action was proposed, funded, initiated, or treated

Number of Acres – The acreage is estimated, calculated, or, in some cases, unavailable. If the proposed treatment specified, for example, a certain number of miles of road clearance with vegetation treatment to take place 50 feet on either side of the road, then the acres could be calculated. Sometimes the proponent of the proposed action provided the acreage. There are even instances in which the GIS tool auto calculated the acreage based on the polygon created to illustrate the general area. In these cases the acreage is higher than what will likely be treated and will be sorted out during future updates.

Vegetation Type - The vegetation type was identified as one or more of the following:

Brush	Oaks
Douglas-fir	Redwood
Grassland	Tanoak
Mixed Conifer	Other

Recommended Maintenance Schedule – Where possible, details are identified to explain how the identified treatment has been or will be maintained, such as frequency of maintenance, type of maintenance treatment, purpose of treatment, and so on.

Funding Source(s) – This field identifies the actual or possible funding source.

APPENDIX H:
HUMBOLDT COUNTY FIRE SAFE REGULATIONS CHECKLIST

County SRA Fire Safe Regulations Checklist (Building Permit)

APPLICANT: _____ DATE___/___/___ REF #_____

LOCATION: _____ APN: _____-_____-_____

.....

NOTE:
These regulations apply to all new construction and development in State Responsibility Areas (SRA) in Humboldt County effective January 1, 1992. These regulations are not retroactive to existing structures and facilities, unless a new use or occupancy is applied for. The following is a summary of the minimum standards for building permit issuance. It is provided for informational purposes only. Reference to the specific adopted language should be made before construction or development plans are prepared.

.....

Road Standards

[ ] Roadway surface provides unobstructed access to conventional drive vehicles including sedans and fire engines using County Road Category 2 standard for surfacing type.

[ ] Roadway turnouts (where required) are 10' wide and 80' long and tapered 25 feet from both ends.

[ ] Roadway structures (bridges and culverts) built to carry minimum load as required in Cal. Vehicle Code Sec. 35550 (40,000 lbs.) and complies with the following standards:
  - [ ] Minimum 15' vertical clearances and designed in conformance with the County Roadway Design Manual.
  - [ ] Signing reflects capability of each bridge for weight, clearance, single lane access, or other limitations, unless signing waived by the Director of Public Works per Section 3112-9 of H.C.C.
  - [ ] One lane bridge has unobstructed visibility from both ends and intervisible turnouts at each end.
  - [ ] "Flatcar" bridge has roadway surface of not less than 9' and meets visibility requirements of one lane bridge.

Driveways and Gates

[ ] Driveways meet minimum road standards described above.

[ ] Driveways less than 1320' long are 10' wide and have 15' minimum vertical clearance and are built to County Road Category 1 standard.

[ ] Driveways longer than 1320' are 10'-12' wide and have 15' minimum vertical clearance with intervisible turnouts and are built to County Road Category 2 standard.

[ ] Driveways exceeding 150' in length but less than 800' have a turnout near the midpoint; driveways longer than 800' have turnouts at intervisible locations at approximately 400' intervals.

[ ] Driveways have maximum grade meeting standard for County Road Category 1: 7%-12% (normal); 11%-18% (tolerable). Grades in excess of 16% must demonstrate conformance with County Roadway Design Manual.

[ ] Driveways have minimum curve radius meeting standard for County Road Category 1: 120' (normal); 50' (tolerable). Curve radius less than 50' must demonstrate conformance with County Roadway Design Manual.

Driveways and Gates (Continued)

[ ] All gates at least 2' wider than the lanes serving the gate and allow a vehicle to stop without blocking traffic.
  [ ] Gates providing access from a road to a driveway are located at least 30' from the roadway, except as provided below.
  [ ] Gates less than 30' from the roadway are permitted when turnouts are constructed next to the travel lanes with safe turning movements and visibility when approaching from either direction of travel.
  [ ] One-way roads accessing gates have turnaround with 40' radius minimum.

Signing and Building Numbering

[ ] Street and road signs (where required):
[ ] Visible from both directions for 100' minimum and installed prior to final acceptance.
[ ] Minimum size of letters/numbers/symbols are 3" tall, 3/8" stroke and contrasting with background color.
[ ] Reflectorized where private road travel speed is more than 30 mph or along County-maintained roads. Wooden sign material used only when reflectorized signs are not required.
[ ] Intersections of roads, streets and private lanes are signed.
[ ] Height, naming, orientation and numbering are according to County standards (H.C.C. Sec. 442-1 et seq.)
[ ] Access limitations signed at the intersection preceeding and no more than 100' from limitations.
[ ] Addresses for buildings:
  [ ] Permanently posted address located at the driveway entrance and visible from the access road.
  [ ] Minimum size of letters/numbers/symbols are 3" tall, 3/8" stroke and contrasting with background color.
  [ ] Reflectorized where access is from private road where travel speed is 30 mph or greater or from County-maintained road. Wooden sign material used only when reflectorized signs are not required.
  [ ] Posted at beginning of construction and maintained thereafter.
  [ ] Address signs along one-way roads are visible from both directions (this means "wrong way" also).
  [ ] A single post carries all addresses where multiple addresses are required at a single driveway.
  [ ] An address sign is located at the nearest road intersection where a roadway provides access soley to a single commercial or industrial business.

Fuel Modification and Setbacks

[ ] Parcels one (1) acre or larger provide at least 30' minimum setback from property lines and/or center of road, except as provided below:
  [ ] Building setback less than 30 feet from property line where open space easement recorded over adjoining parcel with adjustment no more than width of easement and no exception to zoning setbacks.
  [ ] Detached accessory building setback less than 30 feet from property line when constructed using non-combustive/fire-resistive materials and located at least 20' from all other buildings.

[ ] Parcels less than one (1) acre provide the same practical effect as above. Methods of achieving the "same practical effect" include but are not limited to the following:
  [ ] Development of a community water system.
  [ ] Create County Service Area (CSA) or other entity to provide maintenance of defensible space.
  [ ] Use of non-combustible or fire-resistive materials in construction.
  [ ] Installing residential sprinklering.

Fuel Modification and Setbacks (Continued)

[ ] Development of greenbelts in strategic locations.
[ ] Road development with travel lanes and parking lanes which exceed minimum requirements of these regulations.
[ ] Other measures found to provide defensible space.

[ ] Flammable vegetation and fuels caused by site development/construction/fuel modification are lawfully disposed of prior to final inspection.

[ ] Greenbelts proposed by developer are located strategically between structures and wildland fuels.

Provisions for Annual Maintenance

[ ] Annual maintenance of standards and measures secured through condition of building permit. Provisions deemed to satisfy this requirement include but are not limited to:
  [ ] Recordation of a "Notice of Requirement for Maintenance" with the County Recorder's office.
  [ ] Evidence of the property being within a County Service Area (CSA) with responsibility for annual maintenance of fire safe measures.
  [ ] A maintenance association or similar agreement between property owners which is responsible for annual maintenance of fire safe measures for the development and includes the owner's property.
  [ ] Recorded Covenants, Conditions and Restricitons (CC&R) for maintenance of individual measures which are binding and enforceable against the property.
  [ ] Other provisions acceptable to the County.

.....

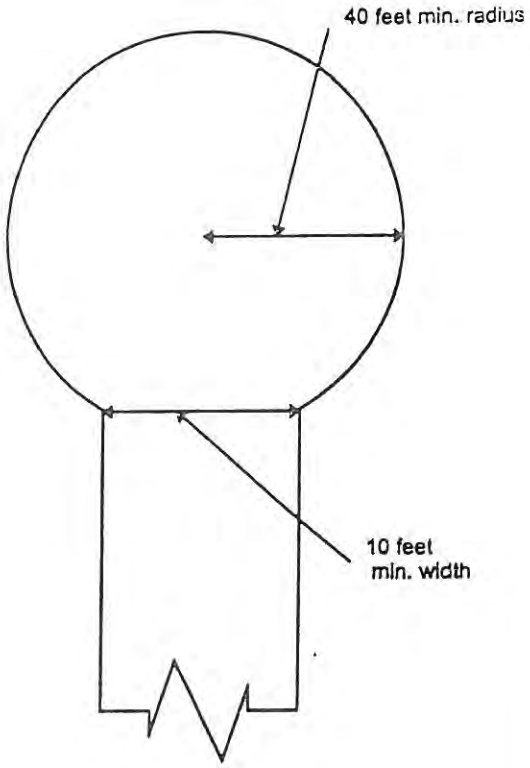
APPLICANT/OWNER'S ACKNOWLEDGEMENT

_____
Signature

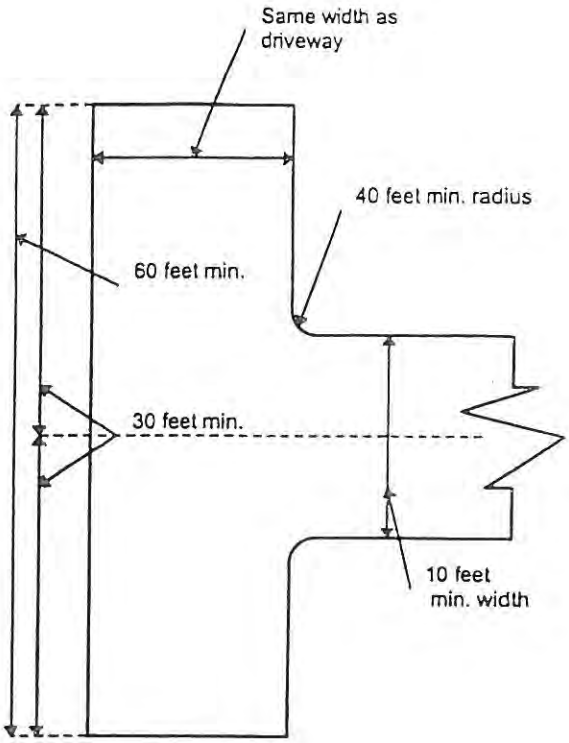
ONCE SIGNED THIS SHEET BECOMES PART OF THE BUILDING PLANS.

(Fire Safe Handout/F:\current\FSCKLST2.doc/Rev.11/3/94)

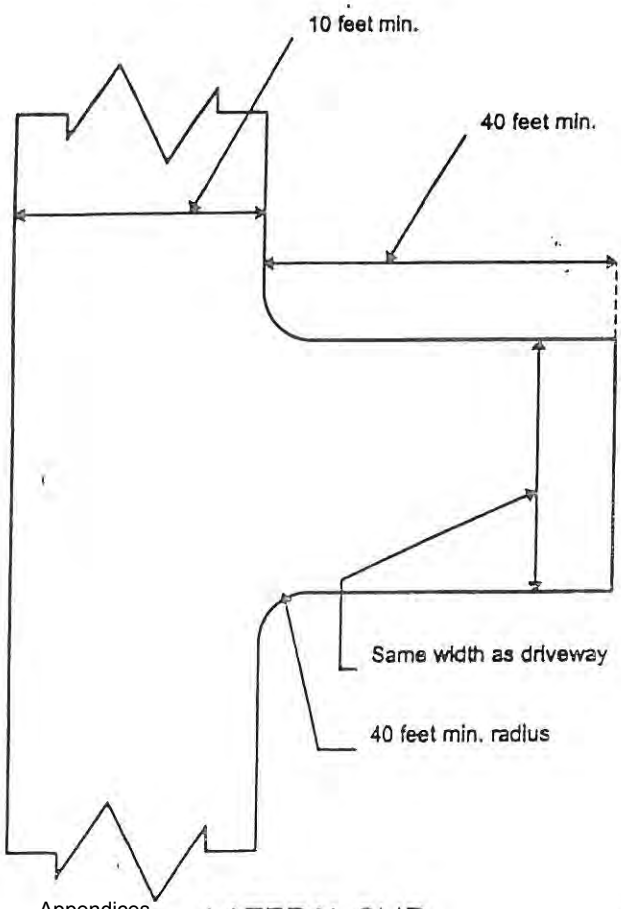
SRA TURNOUTS AND TURNAROUNDS



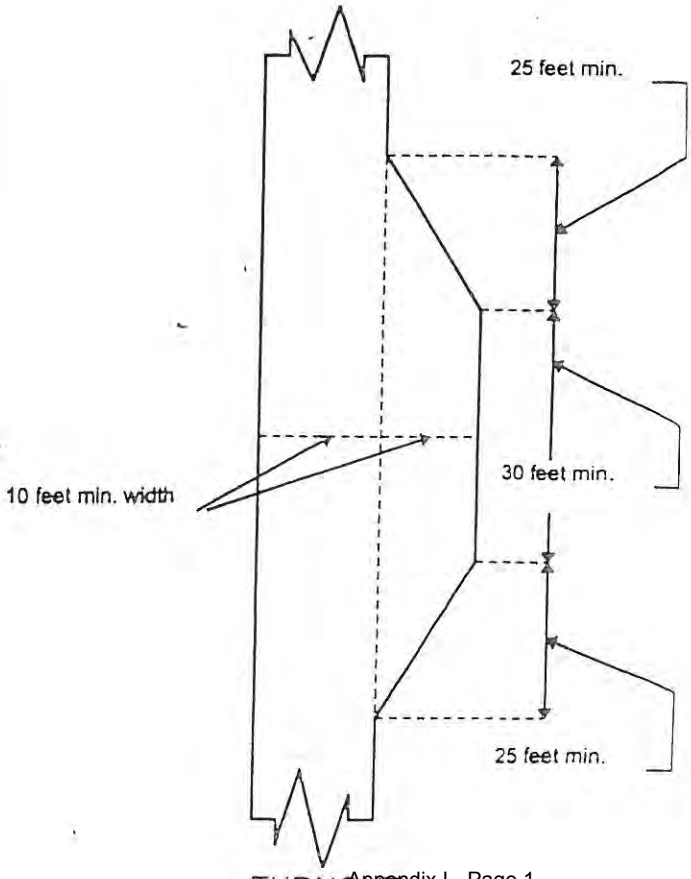
TURNAROUND



HAMMERHEAD T



LATERAL SLIP



TURNOUT

DOMESTIC EMERGENCY WATER SUPPLY SYSTEMS
ILLUSTRATIONS ON REVERSE SIDE

1. THE MINIMUM EMERGENCY WATER STORAGE VOLUME IS 2,500 GALLONS EASILY AVAILABLE FOR FIRE USE.

2. THE EMERGENCY SUPPLY MAY BE SEPARATE FROM THE DOMESTIC SUPPLY OR IT MAY BE SHARED. WHEN SHARED, AND IF THE REFILLING SUPPLY SOURCE (WELL ETC.) CANNOT KEEP UP WITH THE DAILY DOMESTIC USE; THE AMOUNT STORED SHOULD BE INCREASED SO THAT 2,500 GALLONS ARE AVAILABLE FOR FIRE USE ANY TIME OF DAY.

3. THE WATER HYDRANT OR PLACE FOR WATER SUCTION MUST NOT BE FURTHER THAN 1/2 MILE FROM THE DWELLING, OR CLOSER THAN 50 FEET TO THE DWELLING USING ROAD MEASUREMENTS. PARCELS 10AC. OR LESS MUST HAVE THE HYDRANT/SUCTION WITHIN 500 FEET; AND IF THIS IS PHYSICALLY IMPOSSIBLE, WITHIN 1000 FEET.

4. ALL HYDRANT AND WATER SUCTION LOCATIONS MUST PROVIDE A ROAD STANDARD TURNOUT OR TURNAROUND.

5. ALL WATER SUPPLY HYDRANTS AND SUCTION LOCATIONS MUST BE IDENTIFIED WITH A 3 INCH REFLECTORIZED BLUE DOT LOCATED 3 TO 5 FEET ABOVE THE GROUND ON A POST THAT IS WITHIN 3 FEET OF THE HYDRANT. IF LOCATED OFF A DRIVEWAY, ANOTHER BLUE DOT MUST BE ATTACHED TO THE DRIVEWAY ADDRESS SIGN. ROAD SIGNS STATING "FIRE WATER" ARE AN ACCEPTABLE ALTERNATIVE.

6. ALL EXPOSED PLUMBING SHOULD HAVE FREEZE PROTECTION AND CRASH BARRIERS AS NEEDED TO PREVENT DAMAGE.

7. ALL PIPES SUPPLYING WATER TO HYDRANTS MUST BE AT LEAST 3 INCHES IN DIAMETER. SMALLER DESIGNS MUST PROVE THEMSELVES ABLE TO PROVIDE A 200 GPM FLOW FROM THE HYDRANT CONNECTION.

8. ALL HYDRANTS MUST BE 18 INCHES ABOVE GROUND, AT LEAST 8 FEET FROM FLAMMABLE VEGETATION, AT LEAST 4 FEET FROM THE PARKING SURFACE WHERE THE FIRE EQUIPMENT WILL BE WHEN USING IT AND NO MORE THAN 12 FEET FROM THE PARKING SURFACE.

9. ALL HYDRANTS MUST HAVE A 2 1/2 INCH, MALE NATIONAL HOSE CONNECTION WITH CAP.

10. ALL HYDRANTS/VALVES AND CONNECTIONS MUST BE MADE OF BRASS OR OTHER CORROSION RESISTANT MATERIAL (PYROLITE ETC.)

11. A WET HYDRANT USED WITH A GRAVITY SUPPLY OR PRESSURE SYSTEM MUST HAVE A 2 1/2 INCH VALVE.

12. A DRY HYDRANT USED FOR WATER SUCTION DOES NOT NEED A VALVE, BUT DOES REQUIRE A STRAINER (PERFORATED PIPE LENGTH) AT THE END OF THE SUCTION PIPE. THE STRAINER MUST BE AT LEAST 3 FEET LONG. (SEE THE NOTE ON BOTTOM OF OTHER SIDE.)

13. WHERE A PUMP IS RELIED UPON TO DELIVER WATER TO THE HYDRANT (NOT GRAVITY AND NOT SUCTION); IT MUST DELIVER 200 GALLONS PER MINUTE TO THE HYDRANT. IF IT IS AN ELECTRICALLY POWERED PUMP, IT MUST HAVE A FUELED ENGINE BACKUP (OR GENERATOR). ALSO, A STRAINER (SEE #12) IS REQUIRED.

14. WHERE GRAVITY IS USED TO GET THE WATER TO THE HYDRANT, THE SOURCE (TANK) MUST AT LEAST BE HIGHER THAN THE HYDRANT SO THAT ALL 2,500 GALLONS CAN DRAIN OUT WITHOUT SUCTION. ALSO, THE TANK SHOULD BE NO MORE THAN 600 FEET ABOVE THE HYDRANT; OR HAVE A PRESSURE REDUCER RESTRICTING TO 250PSI.

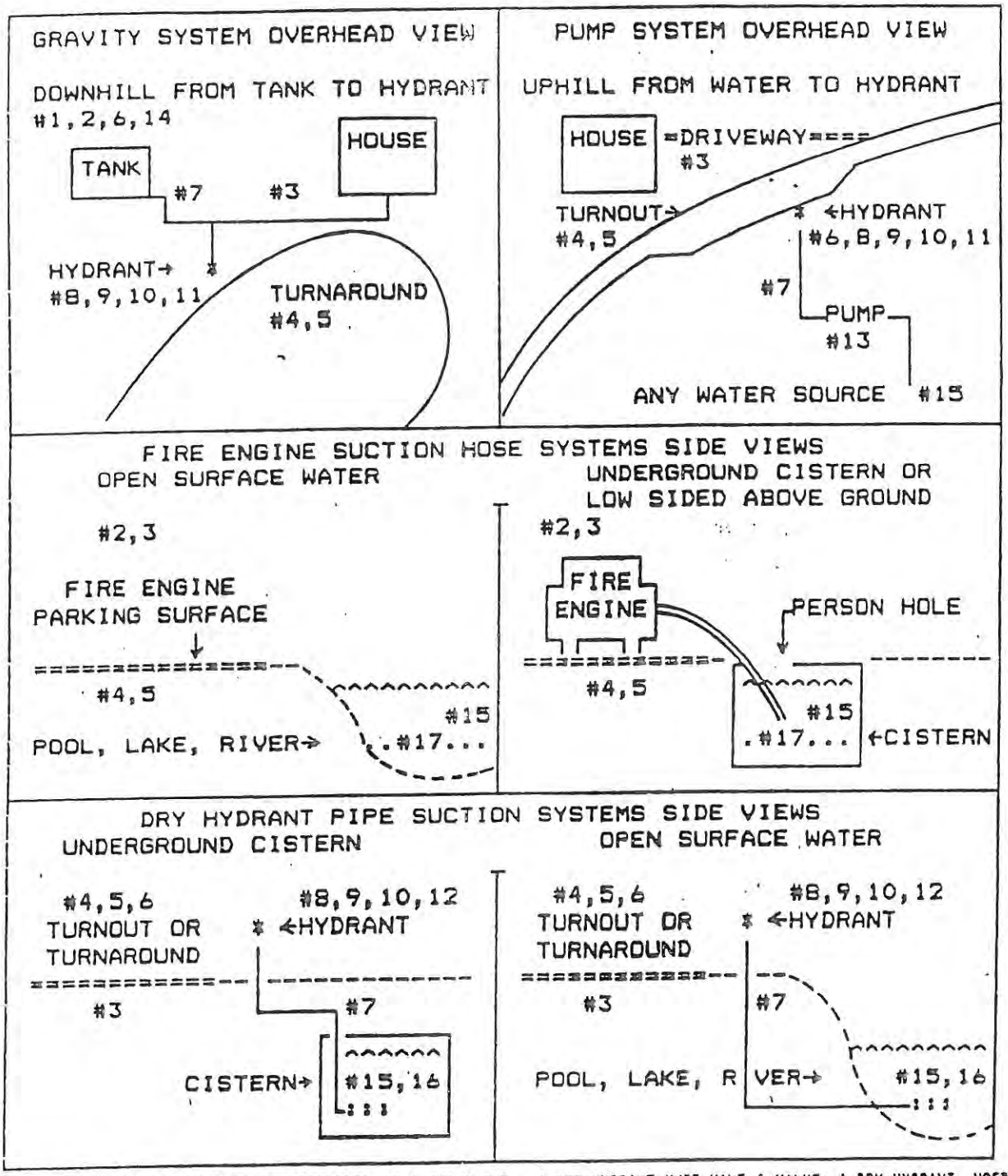
15. WHERE SUCTION IS NEEDED TO GET THE WATER UP OUT OF A SOURCE (BY HOSE, DRY HYDRANT OR PUMP) FROM A NATURAL POND, UNDERGROUND TANK, SWIMMING POOL, ETC., THE END OF THE HOSE OR DRY HYDRANT PIPE STRAINER MUST HAVE 2 FEET OF WATER ABOVE IT AT ALL TIMES TO PREVENT CAVITATION (A VORTEX FUNNEL THAT ALLOWS AIR TO BE SUCKED IN). ALSO, THE END OF THE SUCTION HOSE OR DRY HYDRANT PIPE STRAINER) MUST BE HELD 1 FOOT OFF THE BOTTOM OF STORAGE THAT CAN ACCUMULATE DEBRIS. THIS MEANS THAT THE BOTTOM 3 FEET OF STORAGE AT THE SUCTION POINT IS UNUSABLE AND AT LEAST 2,500 GALLONS MUST BE AVAILABLE 3 FEET ABOVE THE BOTTOM WHEN THE WATER IS AT THE LOWEST LEVEL OF THE YEAR.

16. WHERE SUCTION THROUGH A DRY HYDRANT PIPE IS USED TO GET WATER UP TO A FIRE ENGINE, THE LEVEL WHERE THE SUCTION PIPE STRAINER IS MUST BE NO MORE THAN 15 FEET LOWER THAN THE HYDRANT CONNECTION.

17. WHERE A FIRE ENGINE SUCTION HOSE IS NEEDED TO GET WATER (NO DRY HYDRANT), THE LEVEL WHERE THE STRAINER END OF THE SUCTION HOSE MUST GO CAN BE NO MORE THAN 10 FEET LOWER THAN THE SURFACE WHERE THE ENGINE PARKS. ALSO, THE TOTAL REACH FROM THE EDGE OF THE PARKING SURFACE TO WHERE THE END OF THE SUCTION HOSE MUST BE CAN REQUIRE NO MORE THAN 15 FEET OF SUCTION HOSE AND NO SHARP BENDS. THIS MEANS THAT A TANK WITH NO DRY HYDRANT WILL HAVE TO BE BELOW THE PARKING AREA, OR HAVE A LOW SIDE WALL, BECAUSE IT COULD TAKE MORE THAN 15 FEET OF HOSE TO REACH UP TO THE TOP OF A TANK AND THEN BACK TO THE BOTTOM; AND COULD REQUIRE A VERY SHARP BEND.

SINGLE FAMILY DWELLING
EMERGENCY WATER SUPPLY SYSTEMS

EXPLANATIONS FOR THE NUMBERED ITEMS ON REVERSE SIDE



1 A HYDRANT CAN ALSO BE DESCRIBED AS A STANDPIPE. A WET HYDRANT MUST HAVE A VALVE; A DRY HYDRANT USED FOR SUCTION DOES NOT. USING METAL PIPE FOR THE PIPE EXPOSED ABOVE GROUND IS DESIRABLE. PLASTIC PIPE MAY WORK WITH SUPPORT AND ULTRA-VIOLET PROTECTION.

::: A STRAINER CAN BE AS SIMPLE AS CAPPING THE END OF THE PIPE AND DRILLING 3/8 INCH HOLES SPACED 2 INCHES APART IN ALL DIRECTIONS ON THE LAST 3 FEET OF PIPE. NO FOOT VALVE IS NEEDED FOR FIRE ENGINE USE.

September 16, 1991
CALIFORNIA DEPARTMENT OF FORESTRY AND FIRE PROTECTION

APPENDIX I:
EMERGENCY WATER SUPPLY SYSTEMS

DOMESTIC EMERGENCY WATER SUPPLY SYSTEMS
ILLUSTRATIONS ON REVERSE SIDE

1. THE MINIMUM EMERGENCY WATER STORAGE VOLUME IS 2,500 GALLONS EASILY AVAILABLE FOR FIRE USE.

2. THE EMERGENCY SUPPLY MAY BE SEPARATE FROM THE DOMESTIC SUPPLY OR IT MAY BE SHARED. WHEN SHARED, AND IF THE REFILLING SUPPLY SOURCE (WELL ETC.) CANNOT KEEP UP WITH THE DAILY DOMESTIC USE; THE AMOUNT STORED SHOULD BE INCREASED SO THAT 2,500 GALLONS ARE AVAILABLE FOR FIRE USE ANY TIME OF DAY.

3. THE WATER HYDRANT OR PLACE FOR WATER SUCTION MUST NOT BE FURTHER THAN 1/2 MILE FROM THE DWELLING, OR CLOSER THAN 50 FEET TO THE DWELLING USING ROAD MEASUREMENTS. PARCELS 10AC. OR LESS MUST HAVE THE HYDRANT/SUCTION WITHIN 500 FEET; AND IF THIS IS PHYSICALLY IMPOSSIBLE, WITHIN 1000 FEET.

4. ALL HYDRANT AND WATER SUCTION LOCATIONS MUST PROVIDE A ROAD STANDARD TURNOUT OR TURNAROUND.

5. ALL WATER SUPPLY HYDRANTS AND SUCTION LOCATIONS MUST BE IDENTIFIED WITH A 3 INCH REFLECTORIZED BLUE DOT LOCATED 3 TO 5 FEET ABOVE THE GROUND ON A POST THAT IS WITHIN 3 FEET OF THE HYDRANT. IF LOCATED OFF A DRIVEWAY, ANOTHER BLUE DOT MUST BE ATTACHED TO THE DRIVEWAY ADDRESS SIGN. ROAD SIGNS STATING "FIRE WATER" ARE AN ACCEPTABLE ALTERNATIVE.

6. ALL EXPOSED PLUMBING SHOULD HAVE FREEZE PROTECTION AND CRASH BARRIERS AS NEEDED TO PREVENT DAMAGE.

7. ALL PIPES SUPPLYING WATER TO HYDRANTS MUST BE AT LEAST 3 INCHES IN DIAMETER. SMALLER DESIGNS MUST PROVE THEMSELVES ABLE TO PROVIDE A 200 GPM FLOW FROM THE HYDRANT CONNECTION.

8. ALL HYDRANTS MUST BE 18 INCHES ABOVE GROUND, AT LEAST 8 FEET FROM FLAMMABLE VEGETATION, AT LEAST 4 FEET FROM THE PARKING SURFACE WHERE THE FIRE EQUIPMENT WILL BE WHEN USING IT AND NO MORE THAN 12 FEET FROM THE PARKING SURFACE.

9. ALL HYDRANTS MUST HAVE A 2 1/2 INCH, MALE NATIONAL HOSE CONNECTION WITH CAP.

10. ALL HYDRANTS/VALVES AND CONNECTIONS MUST BE MADE OF BRASS OR OTHER CORROSION RESISTANT MATERIAL (PYROLITE ETC.)

11. A WET HYDRANT USED WITH A GRAVITY SUPPLY OR PRESSURE SYSTEM MUST HAVE A 2 1/2 INCH VALVE.

12. A DRY HYDRANT USED FOR WATER SUCTION DOES NOT NEED A VALVE, BUT DOES REQUIRE A STRAINER (PERFORATED PIPE LENGTH) AT THE END OF THE SUCTION PIPE. THE STRAINER MUST BE AT LEAST 3 FEET LONG. (SEE THE NOTE ON BOTTOM OF OTHER SIDE.)

13. WHERE A PUMP IS RELIED UPON TO DELIVER WATER TO THE HYDRANT (NOT GRAVITY AND NOT SUCTION); IT MUST DELIVER 200 GALLONS PER MINUTE TO THE HYDRANT. IF IT IS AN ELECTRICALLY POWERED PUMP, IT MUST HAVE A FUELED ENGINE BACKUP (OR GENERATOR). ALSO, A STRAINER (SEE #12) IS REQUIRED.

14. WHERE GRAVITY IS USED TO GET THE WATER TO THE HYDRANT, THE SOURCE (TANK) MUST AT LEAST BE HIGHER THAN THE HYDRANT SO THAT ALL 2,500 GALLONS CAN DRAIN OUT WITHOUT SUCTION. ALSO, THE TANK SHOULD BE NO MORE THAN 600 FEET ABOVE THE HYDRANT; OR HAVE A PRESSURE REDUCER RESTRICTING TO 250PSI.

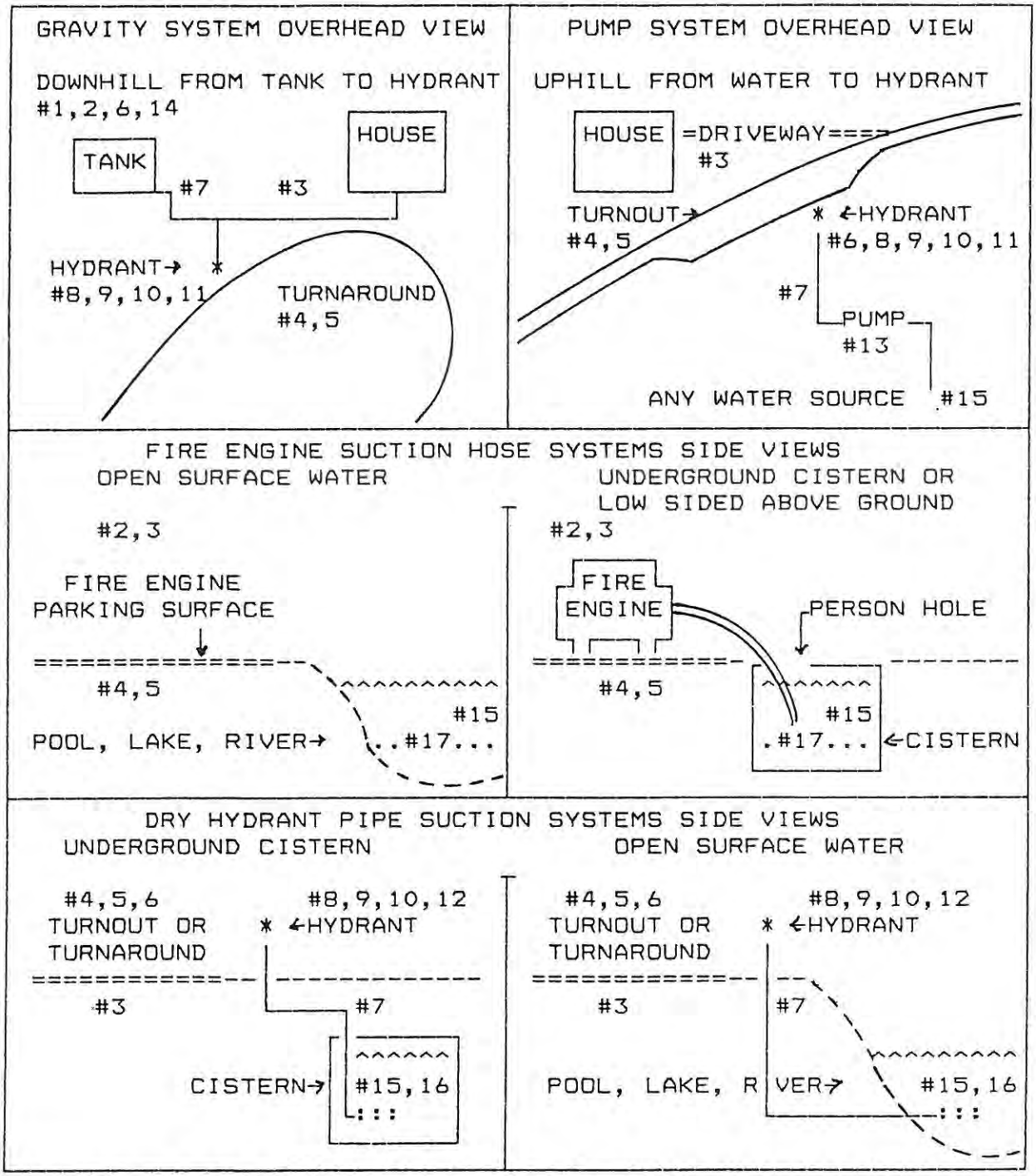
15. WHERE SUCTION IS NEEDED TO GET THE WATER UP OUT OF A SOURCE (BY HOSE, DRY HYDRANT OR PUMP) FROM A NATURAL POND, UNDERGROUND TANK, SWIMMING POOL, ETC., THE END OF THE HOSE OR DRY HYDRANT PIPE STRAINER MUST HAVE 2 FEET OF WATER ABOVE IT AT ALL TIMES TO PREVENT CAVITATION (A VORTEX FUNNEL THAT ALLOWS AIR TO BE SUCKED IN). ALSO, THE END OF THE SUCTION HOSE OR DRY HYDRANT PIPE STRAINER) MUST BE HELD 1 FOOT OFF THE BOTTOM OF STORAGE THAT CAN ACCUMULATE DEBRIS. THIS MEANS THAT THE BOTTOM 3 FEET OF STORAGE AT THE SUCTION POINT IS UNUSABLE AND AT LEAST 2,500 GALLONS MUST BE AVAILABLE 3 FEET ABOVE THE BOTTOM WHEN THE WATER IS AT THE LOWEST LEVEL OF THE YEAR.

16. WHERE SUCTION THROUGH A DRY HYDRANT PIPE IS USED TO GET WATER UP TO A FIRE ENGINE, THE LEVEL WHERE THE SUCTION PIPE STRAINER IS MUST BE NO MORE THAN 15 FEET LOWER THAN THE HYDRANT CONNECTION.

17. WHERE A FIRE ENGINE SUCTION HOSE IS NEEDED TO GET WATER (NO DRY HYDRANT), THE LEVEL WHERE THE STRAINER END OF THE SUCTION HOSE MUST GO CAN BE NO MORE THAN 10 FEET LOWER THAN THE SURFACE WHERE THE ENGINE PARKS. ALSO, THE TOTAL REACH FROM THE EDGE OF THE PARKING SURFACE TO WHERE THE END OF THE SUCTION HOSE MUST BE CAN REQUIRE NO MORE THAN 15 FEET OF SUCTION HOSE AND NO SHARP BENDS. THIS MEANS THAT A TANK WITH NO DRY HYDRANT WILL HAVE TO BE BELOW THE PARKING AREA, OR HAVE A LOW SIDE WALL, BECAUSE IT COULD TAKE MORE THAN 15 FEET OF HOSE TO REACH UP TO THE TOP OF A TANK AND THEN BACK TO THE BOTTOM; AND COULD REQUIRE A VERY SHARP BEND.

SINGLE FAMILY DWELLING
EMERGENCY WATER SUPPLY SYSTEMS

EXPLANATIONS FOR THE NUMBERED ITEMS ON REVERSE SIDE



‡ A HYDRANT CAN ALSO BE DESCRIBED AS A STANDPIPE. A WET HYDRANT MUST HAVE A VALVE; A DRY HYDRANT USED FOR SUCTION DOES NOT. USING METAL PIPE FOR THE PIPE EXPOSED ABOVE GROUND IS DESIRABLE. PLASTIC PIPE MAY WORK WITH SUPPORT AND ULTRA-VIOLET PROTECTION.

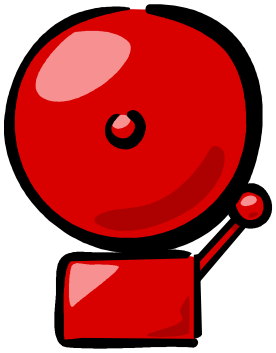
::: A STRAINER CAN BE AS SIMPLE AS CAPPING THE END OF THE PIPE AND DRILLING 3/8 INCH HOLES SPACED 2 INCHES APART IN ALL DIRECTIONS ON THE LAST 3 FEET OF PIPE. NO FOOT VALVE IS NEEDED FOR FIRE ENGINE USE.

September 16, 1991
CALIFORNIA DEPARTMENT OF FORESTRY AND FIRE PROTECTION

APPENDIX J:
CAL FIRE EVACUATION TIPS

Evacuation Tips

Evacuation Tips



Evacuations save lives and allow responding personnel to focus on the emergency at hand.
Please evacuate promptly when requested!

The Law

California law authorizes officers to restrict access to any area where a menace to public health or safety exists due to a calamity such as flood, storm, fire, earthquake, explosion, accident or other disaster. Refusal to comply is a misdemeanor. (Penal Code 409.5)

Evacuation Orders

The terms ***Voluntary*** and ***Mandatory*** are used to describe evacuation orders. However, local jurisdictions may use other terminology such as *Precautionary* and *Immediate Threat*. These terms are used to alert you to the significance of the danger. **All evacuation instructions provided by officials should be followed immediately for your safety.**

Long Before a Fire Threatens

Prepare an *Evacuation Checklist* and Organize:

- Critical medications.
- Important personal papers, photos.
- Essential valuables.
- Pet and livestock transport, limited amount of pet food.
- Change of clothing, toiletries.
- Cell phone.
- Critical papers and effects in a fire-proof safe.
- An Evacuation Route Map with at least two routes.*
- Drive your planned route of escape before an actual emergency.*

*During an evacuation, law enforcement/ emergency personnel may determine your route.

If Evacuation is a Possibility

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

Evacuation Tips

The Evacuation Process

1. Officials will determine the areas to be evacuated and the routes to use depending upon the fire's location, behavior, winds, terrain, etc.
2. Law enforcement agencies are typically responsible for enforcing an evacuation order. **Follow their directions promptly.**
3. You will be advised of potential evacuations as early as possible. You must take the initiative to stay informed and aware. Listen to your radio/TV for announcements from law enforcement and emergency personnel.
4. You may be directed to temporary assembly areas to await transfer to a safe location.

If You Become Trapped

While in your vehicle:

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

While on foot:

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

While in your home:

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

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

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

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

Returning Home

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

When you return home:

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

www.fire.ca.gov

APPENDIX K:

PUBLIC RESOURCES CODE SECTION

APPENDIX K: PUBLIC RESOURCES CODE SECTION 4291

4291. (a) A person who owns, leases, controls, operates, or maintains a building or structure in, upon, or adjoining a mountainous area, forest-covered lands, brush-covered lands, grass-covered lands, or land that is covered with flammable material, shall at all times do all of the following:

(1) Maintain defensible space of 100 feet from each side and from the front and rear of the structure, but not beyond the property line except as provided in paragraph (2). The amount of fuel modification necessary shall take into account the flammability of the structure as affected by building material, building standards, location, and type of vegetation. Fuels shall be maintained in a condition so that a wildfire burning under average weather conditions would be unlikely to ignite the structure. This paragraph does not apply to single specimens of trees or other vegetation that are well-pruned and maintained so as to effectively manage fuels and not form a means of rapidly transmitting fire from other nearby vegetation to a structure or from a structure to other nearby vegetation. The intensity of fuels management may vary within the 100-foot perimeter of the structure, the most intense being within the first 30 feet around the structure. Consistent with fuels management objectives, steps should be taken to minimize erosion. For the purposes of this paragraph, "fuel" means any combustible material, including petroleum-based products and wildland fuels.

(2) A greater distance than that required under paragraph (1) may be required by state law, local ordinance, rule, or regulation. Clearance beyond the property line may only be required if the state law, local ordinance, rule, or regulation includes findings that the clearing is necessary to significantly reduce the risk of transmission of flame or heat sufficient to ignite the structure, and there is no other feasible mitigation measure possible to reduce the risk of ignition or spread of wildfire to the structure. Clearance on adjacent property shall only be conducted following written consent by the adjacent landowner.

(3) An insurance company that insures an occupied dwelling or occupied structure may require a greater distance than that required under paragraph (1) if a fire expert, designated by the director, provides findings that the clearing is necessary to significantly reduce the risk of transmission of flame or heat sufficient to ignite the structure, and there is no other feasible mitigation measure possible to reduce the risk of ignition or spread of wildfire to the structure. The greater distance may not be beyond the property line unless allowed by state law, local ordinance, rule, or regulation.

(4) Remove that portion of a tree that extends within 10 feet of the outlet of a chimney or stovepipe.

(5) Maintain a tree, shrub, or other plant adjacent to or overhanging a building free of dead or dying wood.

(6) Maintain the roof of a structure free of leaves, needles, or other vegetative materials.

(7) Prior to constructing a new building or structure or rebuilding a building or structure damaged by a fire in an area subject to this section, the construction or rebuilding of which requires a building permit, the owner shall obtain a certification from the local building official that the dwelling or structure, as proposed to be built, complies with all applicable state and local building standards, including those described in subdivision (b) of Section 51189 of the Government Code, and shall provide a copy of the certification, upon request, to the insurer providing course of construction insurance coverage for the building or structure. Upon completion of the construction or rebuilding, the owner shall obtain from the local building official, a copy of the final inspection report that demonstrates that the dwelling or structure was constructed in compliance with all applicable state and local building standards, including those described in subdivision (b) of Section 51189 of the Government Code, and shall provide a copy of the report, upon request, to the property insurance carrier that insures the dwelling or structure.

(b) A person is not required under this section to manage fuels on land if that person does not have the legal right to manage fuels, nor is a person required to enter upon or to alter property that is owned by any other person without the consent of the owner of the property.

(c) (1) Except as provided in Section 18930 of the Health and

Safety Code, the director may adopt regulations exempting a structure with an exterior constructed entirely of nonflammable materials, or, conditioned upon the contents and composition of the structure, the director may vary the requirements respecting the removing or clearing away of flammable vegetation or other combustible growth with respect to the area surrounding those structures.

(2) An exemption or variance under paragraph (1) shall not apply unless and until the occupant of the structure, or if there is not an occupant, the owner of the structure, files with the department, in a form as the director shall prescribe, a written consent to the inspection of the interior and contents of the structure to ascertain whether this section and the regulations adopted under this section are complied with at all times.

(d) The director may authorize the removal of vegetation that is not consistent with the standards of this section. The director may prescribe a procedure for the removal of that vegetation and make the expense a lien upon the building, structure, or grounds, in the same manner that is applicable to a legislative body under Section 51186 of the Government Code.

(e) The Department of Forestry and Fire Protection shall develop, periodically update, and post on its Internet Web site a guidance document on fuels management pursuant to this chapter. Guidance shall include, but not be limited to, regionally appropriate vegetation management suggestions that preserve and restore native species, minimize erosion, minimize water consumption, and permit trees near homes for shade, aesthetics, and habitat; and suggestions to minimize or eliminate the risk of flammability of non-vegetative sources of combustion such as woodpiles, propane tanks, decks, and outdoor lawn furniture.

(f) As used in this section, "person" means a private individual, organization, partnership, limited liability company, or corporation.

4291.1. (a) Notwithstanding Section 4021, a violation of Section 4291 is an infraction punishable by a fine of not less than one hundred dollars ($100), nor more than five hundred dollars ($500). If a person is convicted of a second violation of Section 4291 within five years, that person shall be punished by a fine of not less than two hundred fifty dollars ($250), nor more than five hundred dollars ($500). If a person is convicted of a third violation of Section 4291 within five years, that person is guilty of a misdemeanor and shall be punished by a fine of not less than five hundred dollars ($500).

If a person is convicted of a third violation of Section 4291 within five years, the department may perform or contract for the performance of work necessary to comply with Section 4291 and may bill the person convicted for the costs incurred, in which case the person convicted, upon payment of those costs, shall not be required to pay the fine. If a person convicted of a violation of Section 4291 is granted probation, the court shall impose as a term or condition of probation, in addition to any other term or condition of probation, that the person pay at least the minimum fine prescribed in this section.

(b) If a person convicted of a violation of Section 4291 produces in court verification prior to imposition of a fine by the court, that the condition resulting in the citation no longer exists, the court may reduce the fine imposed for the violation of Section 4291 to fifty dollars ($50).

4291.3. Subject to any other applicable provision of law, a state or local fire official, at his or her discretion, may authorize an owner of property, or his or her agent, to construct a firebreak, or implement appropriate vegetation management techniques, to ensure that defensible space is adequate for the protection of a hospital, adult residential care facility, school, aboveground storage tank, hazardous materials facility, or similar facility on the property. The firebreak may be for a radius of up to 300 feet from the facility, or to the property line, whichever distance is shorter.