Tehama East Community Wildfire Protection Plan
And Risk Assessment
With Recommendations for Fire
And Pre-Fire Fuels Treatment Opportunities

Photo courtesy Rich Reiner, The Nature Conservancy

Report to the California Fire-Safe Council, Tehama County Resource Advisory Committee, Lassen National Forest, Bureau of Land Management, Tehama-Glenn Fire Safe Council, and Manton Fire Safe Council

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Through grant funding from
Tehama County Resource Advisory Committee/Lassen National Forest
Grant # 06-DG-11050650-001

And

The California Fire Safe Council National/Bureau of Land Management
WUI Community Rural Fire Assistance
Grant No. CFDA#15.228.

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ACRONYMS

Acronym	Definition
BLM	Bureau of Land Management
CDF	California Department of Forestry and Fire Protection
CNDDB	California Natural Diversity Data Base
CRMP	Coordinated Resource Management Planning Group
DFG	California Department of Fish & Game
EHR	Erosion Hazard Rating
FB	Fuel break
FEMA	Federal Emergency Management Agency
FMP	Fire Management Plan (Federal)
FRAP	Forest & Rangeland Resources Assessment Program (CDF)
FSC	Fire Safe Council
LCPOA	Lake California Property Owners Association
LRMP	Land & Resource Management Plan
MNF	Mendocino National Forest
MNFFMP	Mendocino National Forest Fire Management Plan
MNFRMP	Mendocino National Forest Resource Management Plan
NRCS	Natural Resources Conservation Service
RCD	Resource Conservation District
TCRCD	Tehama County Resource Conservation District
TCWAR	Thomes Creek Watershed Analysis Report
RPF	Registered Professional Forester
SCRMP	Sunflower Coordinated Resource Management Planning Group
STNF	Shasta Trinity National Forest
STFMP	Shasta-Trinity Fire Management Plan
STNFRMP	Shasta Trinity National Forest Resource Management Plan
UC	University of California
USDA	United States Department of Agriculture
VMP	VMP Vegetation Management Program (CDF)
WAR	Watershed Analysis Report
WRCC	Western Regional Climate Center
WSRCD	Western Shasta Resource Conservation District

INTRODUCTION

Human-Wildland Interactions and Communities at Risk within Eastern Tehama County

Throughout eastern Tehama County and in California as a whole, communities adjacent to and within the state's wildlands have experienced dramatic growth. Development in these areas has taken a number of forms. In addition to the simple expansion of the urban fringe, rural subdivisions have sprung up far from urban centers, and lots splits have allowed homes and small ranches to be built on individual parcels. This has created residential densities that approach those of urban areas. These remote areas of development are often created without many of the infrastructure components and fire safety features that are integral to fire protection. Significant among these deficiencies are insufficient access on two lane roads for ingress and egress of fire fighting equipment, inadequate water supply systems, and the presence of mobile homes as residences on many small rural parcels. Considering that mobile homes are often installed with little or no vegetation removal, this type of residence is more susceptible to flash fires.

Within Tehama County's eastside, the conversion of wild areas into urban and residential uses is currently taking place largely within the county's grasslands and oak woodlands. Rural development is also occurring within the area's chaparral and forested wildlands at the urban fringe of communities such as Bend, Manton, Paynes Creek, and Ponderosa Sky Ranch. In terms of wildfire threat, these areas of rural development have been described as a point where the fuel feeding a wildfire changes from natural (wildland) to manmade fuel, such as structures, crops, and urban debris. This intermingling of wildland and manmade fuel is often referred to as the "wildland-urban interface/intermix" and has made the control of wildland fires more difficult and costly. It has also dramatically increased the danger and potential destruction caused by wildfire. Scattered development of individual homes and structures is also found near rural population centers such as Lyonsville, Panther Spring, Lyman Springs, and Cohasset. Much of the eastside planning area is steep and rocky, making construction difficult if not impossible. This physical characteristic of the eastside has focused much of the current development on areas that are relatively flat and are already being utilized for urban development. Some outlying areas such as Forward Valley (the area immediately east of the Manton Community) and scattered parcels along the Sacramento River already have sites suitable for construction.

During large wildfire events, widely scattered development requires fire fighting forces to disperse in order to protect numerous isolated structures. As a result, manpower and other resources necessary to initiate attack on a fire front cannot be organized, allowing fires to spread and build in intensity much more rapidly. In addition, this dispersal of development makes rescue and evacuation efforts during such emergencies more difficult, dangerous, and time consuming. Of equal importance is that scattered urban development patterns make the efficient use of prescribed burning on a landscape scale more expensive and risky. Smoke from prescribed burns can damage homes, and uncontrolled fire in more densely populated landscapes can destroy residential developments, thus increasing the cost of liability claims made against land management entities.

I. Executive Summary

Problem Overview

Societal pressures make increasing demands upon the environment. Expansion of urban areas into natural landscapes, along with the increased utilization of natural resources, requires the control of environmental interactions that have developed over millennia. As a result, natural processes can be pushed out of balance. The hazard from wildfire exemplifies the dramatic effect that human occupation has had on the environment. In order to more intensively utilize landscapes and the resources they contain, wildfire has in the past been largely excluded from western landscapes. However, this control has impacted the equilibrium between fire and vegetation. It has also indirectly affected other natural systems such as hydrology and wildlife interactions. In many areas affected by human influence, stands of live and dead vegetation have developed to unnatural levels. Now, when wildfires occur, their intensity and the severity with which they affect landscapes is often extreme.

Eastern Tehama County, like much of Northern California, is at very high risk of experiencing catastrophic wildfire. Much of the county's eastside area is rural or in the wildland/urban interface between urban development and those lands managed for ranching, timber production, open space, and watershed resources. Over the past 90 years, many of these areas have developed high levels of fuel loading due to aggressive fire suppression by state and federal agencies as well as private landowners. These high fuel loads have increased the potential for large wildfires that could destroy an array of natural resources along with millions of dollars worth of public and private property. The problem of hazardous fuel conditions continues to grow each year as more people move into and utilize the area's grasslands, oak woodlands, and chaparral. Greater recreational use of Bureau of Land Management parcels and Lassen National Forest lands located at the easternmost edge of the Tehama East fire planning area has also contributed to an increase in the threat of wildfire on local public lands as well as adjacent private parcels.

The Tehama East Community Wildfire Protection Plan was developed as a means of describing current fire related conditions within Tehama County and of identifying public and private assets at risk from wildfire, as well as to assess currently in place infrastructure developed in order to protect those assets. The plan also recommends, justifies, and prioritizes future short-term and long-term mitigation measures that are expected to provide increased fire protection within the county's eastside area. Finally, this document provides planning and background information necessary for local organizations to obtain grants and secure funding for future fuel reduction projects and other mitigation measures.

Process Overview and Objectives

As a member of the Tehama–Glenn Fire Safe Council, the Tehama

County Resource Conservation District (TCRCD) expressed concern about the increasing threat of wildland fire throughout Tehama County attributable to increasing volumes of wildland fuels as well as urban development. TCRCD was also cognizant of the increasing cost to fight wildfires and the need to plan, develop, and conduct fire and fuels management projects. It was recognized that these cost increases are impacting the financial well being of federal, state, and local government entities and are having a negative impact on the continued implementation of important resource protection work. To address the issue of increased financial burden, TCRCD advocated a combined cost reduction and revenue generating approach to the problem.

In order to reduce the cost of planning and executing fire hazard reduction projects, an overarching bi-county fire planning and risk assessment framework was proposed which would incorporate the array of fire and fuels management plans, policies, and projects being developed by stakeholders located throughout the county. Utilizing the collaboration and cooperation required in order to develop a landscape scale planning and assessment document, it was felt that cost savings could be achieved in identifying common problems, developing mitigation measures to solve these problems, and implementing mitigation projects. As an example, it was suspected that individual agency fire planning documents could be prepared that were smaller and more succinct if landscape scale issues discussed in broad countywide or regional plans were incorporated through reference. In addition, fire and land management entities having similar goals as identified in agency specific fire plans might identify opportunities to collaborate on an array of common issues in order to solve similar problems.

Another means of achieving improved project effectiveness and cost efficiency was through the development a multi-county map of fire related projects which allows public and private land managers, community groups, and government agencies to visually demonstrate the relationship between their proposed project and those that are in the planning stage, in progress, or completed. This information is expected to help those conducting fuels reduction work to demonstrate the value of their projects as they relate to other fuels reduction efforts in creating landscape scale protection against catastrophic wildfire. Through this explanation and demonstration of the interconnectedness between individual projects, applications for permits or funding have a much greater chance of receiving approval.

Another component of this project's larger planning process was the creation and mapping of natural fire management units that are based upon topography and natural fire breaks, both of which directly affect fire behavior. As a result of these fire management units being based upon natural phenomena such as large

drainages and canyons, they often span multiple agency jurisdictions. Focusing on the environmental realties of landscapes rather than on organizational agenda is expected to result in the identification of commonalities between stakeholders concerns. With an increased understanding of organizational perspectives between stakeholders, increased communication and collaboration between concerned parties is expected. In addition, to the map, a database was developed that catalogs assets at risk, in place fire management infrastructure, and other significant features found within a particular planning unit. When this information is linked to the map, successful fire and fuels management strategies can be developed that are based upon conditions found within the Tehama East fire planning area. This kind of resource and wildfire management information will greatly assist out of area fire fighting units in managing fires in a manner that promotes expeditious containment and maximum resource protection.

In addition to development issues within the eastside's wildland urban interface, the fire ecology of the area's grasslands, oak woodlands, and chaparral were of significant concern. In order to improve environmental conditions found within the fire dependent landscapes of Tehama County's eastside area, the naturally occurring fire regimes that developed within this portion of the county must be reestablished. Through the mapping of local vegetation and modeling of its response to specific patterns of wildfire, information will be developed that provides insight into the most advantageous use of prescribed fire as a means to reestablish natural vegetation patterns. Understanding the relationships between vegetation and the temporal patterns of wildland fire will enable land managers to make educated proposals for fire management policies as well to develop and prioritize fuels management and wildlife habitat improvement burns.

To accomplish this, the Tehama East Vegetation Mapping and Modeling project was developed in order to:

- Create a vegetation classification at the alliance-level with crosswalks to wildlife habitats.
- Create a detailed map of current vegetation within a significant portion of eastern Tehama County
- Develop state and transition models for each vegetation type as a means to identify reference conditions and historic fire regimes
- Develop a fire condition class map for vegetation in order to identify the departure from "natural" fire ecology conditions.
- Incorporate this information into a future update of the Tehama East Community Wildfire Protection Plan

Another objective of this planning document and the process through

which it was developed is to affirm the adequacy of local fire management planning efforts and the specific steps taken to implement the recommendations developed through the planning process. To accomplish this, the Tehama East CWPP was modeled after the California Fire Plan Workgroup's March 2004 version of the "Community Fire Plan Template," otherwise known as the Community Wildfire Protection Plan. Through the utilization of this template, the Tehama East CWPP meets the compliance criteria for grant funding of fire hazard mitigation projects under the Federal Healthy Forest Initiative and Healthy Forests Restoration Act (HFRA 2003) as well as the Federal Emergency Management Agency's (FEMA) Disaster Mitigation Act of 2000 (DMA 2000).

The Tehama East Community Wildfire Protection Plan is a working document that will need to be updated in order to maintain its usefulness. To accomplish this, a yearly review of changes in the eastside areas assets at risk and wildfire protection infrastructure will be made by the CalFire pre-fire engineering staff, members of the Tehama–Glenn Fire Safe Council, Manton Fire Safe Council, and the staff from the Tehama County Resource Conservation District. Through this process of updating the plan's content, information about local fire conditions can be kept current, resulting in better decision making by both landowners and agency personnel. In addition, the plan provides background information pertaining to the eastside area that will be useful to local stakeholders in preparing site and agency specific fire plans, as well as grant applications for future fire management and fuels reduction projects.

Priority Projects Summary

Based upon the objectives of this study as well as input from local area stakeholders, the top priority of project work is the protection of residents and fire fighters as well as public and private property. To address these priorities, project work was ranked in significance as follows:

- Projects that provide immediate and direct impact on the threat and intensity of wildfires such as fuel breaks and fuel reduction projects;
- Projects that result in improvements to fire fighting and fire protection infrastructure including access for fire fighting forces, egress of residents, water storage, and water delivery system upgrades;
- Projects that involve regulatory matters such as changes in laws, ordinances, and codes that relate to fire safety and fire management; and
- Projects that entail planning endeavors such as the development of a coordination plan for maintenance and vegetation management projects along Ponderosa Way and development of long term funding sources.

Acknowledgments

The Tehama County Resource Conservation District would like extend a special thanks to the members of the Tehama East Community Wildfire Protection Plan Workgroup which was created to develop this planning project's work scope, determine tentative issues, and assure that its end products met the requirements of a formal Community Wildfire Protection Plan:

- Simon Avery/The Nature Conservancy
- Kim Desena/CAL FIRE
- Tom Garcia/Lassen National Forest
- Peter Hujic and Jeff Galang/The Nature Conservancy
- Miriam Morrell/United States Fish & Wildlife Service
- John Sprague/CAL FIRE

Special thanks are owed to Catherine Benjamin and Randy Cousineau, Tehama County RCD staff who provided GIS analysis and cartographic services. Others who generously provided their time and assistance to this project include Robin Bryant, Grant Coordinator of the Almanor Ranger District, and Amber Gardiner, Grants Manager of the California Fire Safe Council. Additional thanks is also given to the staff of the CalFire and Resource Assessment Program staff who were generous with their time and technical assistance in the use of State fire data.

II. POLICIES

Federal, State, and Local Fire Threat Mitigation Strategies

Introduction

In an attempt to improve the effects of wildfire upon urban areas, federal fire managers authorized State Foresters to determine which communities adjacent to federal lands were exposed to a significant threat from wildland fire originating on public property. CalFire undertook the task of generating a list of at-risk communities showing developed areas in California not within the immediate vicinity of national forests and Bureau of Land Management properties. In developing the California list, CalFire reassessed all areas of the state, regardless of ownership. Three main factors were used to determine fire threats to Wildland Urban Interface (WUI) areas within the state:

- Fuel hazards ranking (ranking vegetation types by their potential fire behavior during a wildfire)
- Assessing the probability of fire (the annual likelihood that a large damaging wildfire would occur within a particular vegetation type)
- Assessing housing densities in WUI areas (areas of intermingled wildland fuels and urban environmental that are in the vicinity of fire threats)

Out of this statewide assessment, a list of 1,283 fire threatened communities was developed. Of these threatened communities, 843 were found to be adjacent to federal lands. The table below lists these officially recognized communities that are within eastern Tehama County. The Hazard Level Code shown designates a community's fire threat level, with 3 indicating the highest level of threat.

Officially Recognized Communities at Risk within Eastern Tehama County[1.]

Community Number	Community Name	Federal Threat [2.]	Hazard Level [3.]
85	Bend	X	2
283	Dairyville		2
656	Los Molinos	X	2
678	Manton	X	3
840	Paynes Creek	X	3
920	Red Bluff	X	3

1. The community of Ponderosa Sky Ranch is also a significant community within the eastern Tehama County fire plan project area. Although not currently on the National Registry of Fire Threatened Communities, it was determined to be possibly at risk by CalFire during development of the 2005 Tehama-Glenn Unit Fire Management Plan.
2. Federal Threat Code "X" indicates some or all of the wildland fire threat to the community comes from federal lands (e.g. US Forest Service, BLM, or Department of Defense).
3. Hazard Level Code indicates the fire threat level, with 2 denoting moderate threat and 3 denoting high threat.

In addition to identifying communities at a significant risk from wildfires, an array of fire policies, planning efforts, and program initiatives have been developed to improve the current fire situation. These policies and plans developed by all levels of government direct the management of fire and fuels within the Tehama East Community Wildfire Protection Plan project area. At the same time, an array of programs have been developed at the federal, state, and local levels to translate these polices into direct impacts on fire threatened communities and landscapes. These policies, planning efforts, and project implementation programs are described herein, starting with the broadest expressions of how to improve the current negative impact that fire has upon the nation's wildlands and upon the communities there.

Federal Wildland Fire Management Policy and Program Review

The 1995 Federal Wildland Fire Management Policy and Program Review revised an array of federal policies and procedures pertaining to the suppression and use of fire. This legislation was an attempt to change the federal outlook on the role of wildfire within the environment, as well as to better control and utilize this natural phenomenon in order to achieve positive impacts on the nation's landscapes. The policy directs federal wildland fire agencies to achieve a balance between fire suppression and fuels management in order to sustain healthy forests, especially those in fire-adapted ecosystems. The 1995 review began a process that redirected some dollars allocated for wildland fire suppression to a more proactive fuels management program. Modest increases in budget allocations were made, and specific numbers of acres to be treated was targeted, dictating that the primary treatment method for hazard fuels reduction would be prescribed fire.

Western National Forest: A Cohesive Strategy

In April 1999, the US General Accounting Office (GAO) issued a report to the subcommittee on Forests and Forest Health, the Committee on Resources, and the House of Representatives entitled "Western National Forest - A Cohesive Strategy is needed to Address Catastrophic Wildfire Threats." While the Forest Service in the previous decade had attempted to reduce the threat of catastrophic wildland fire through the use of timber sales and understory tree removal prescriptions, this report recognized that the agency had failed to make significant progress in reducing the number and severity of large wildfires. Further, the GAO report indicated that accumulation of vegetation having little or no commercial value was a critical component in fueling destructive wildfires.

National Fire Plan

During the 2000 fire season, wildfires burned millions of acres throughout the United States. These fires dramatically illustrated the threat to human lives and development. In response to these catastrophic fires, President Clinton requested the Secretaries of Agriculture and Interior to submit by September 8, 2000, a report called "Managing the Impact of Wildfires on Communities and the Environment, A Report in Response to the Wildfires of 2000." Collectively, this report, its accompanying budget request, and Congressional direction for substantial new appropriations for wildland fire management, action plans, and agency strategy have become known as the National Fire Plan (NFP). The NFP was created as a cooperative, long term effort of the United States Forest Service, Bureau of Land Management, and National Association of State Foresters to protect communities and restore ecological health on federal lands. A major component of the NFP was funding for projects designed to reduce fire risks to communities. The NFP provided the foundation and momentum for the Healthy Forest Initiative of 2002 and the Healthy Forest Restoration Act of 2003. The NFP contains five key areas to which funding will be channeled:

- *Firefighting Resources* to increase the level of funding for suppression resources to the Most Efficient Levels (MEL) based on the values at risk and the cost of staffing a fire suppression force to protect them;
- *Rehabilitation and Restoration* to establish the formation of Burned Area Emergency Rehabilitation (BAER) teams that respond to large and damaging wildfires by identifying emergency projects to protect life, property, and key ecosystem components from damage caused by wildfire;
- *Hazard Fuel Reduction*, working with area cooperators, to identify and implement projects to reduce potential wildfire damage;
- *Community Assistance* to direct federal wildland fire managers to work with communities in order to reduce hazardous fuels, increase local employment with jobs in restoration and fuel reduction projects, and provide defensible space information, volunteer and rural firefighting assistance, and economic action programs; and
- *Accountability* to establish a tracking system to monitor progress of acres treated and monies spent.

In addition, the National Fire Plan (NFP) focuses funding and technical assistance to those communities most at risk from the impacts of wildfire by establishing a Federal definition of at-risk communities as well as a process for designating these threatened urban areas. At risk communities are considered to be the most impacted by wildland fire and thus become priority areas for federal fire fighting and

fire management resources. Originally these communities were considered to be those that were located immediately adjacent to federal lands. Over various iterations of the National Fire Plan, the definition of an at-risk community has been broadened to include all communities where structures and other forms of urban development meet (interface) or mingle (intermix) with undeveloped wildlands and their associated vegetative fuel.

The enabling legislation of the National Fire Plan establishes development densities of at-risk interface communities at three or more structures per acre. Alternatively, these areas are defined as those having 250 or more people per square mile. These at--risk areas must have shared municipal services such as electricity and must receive fire protection by a local governmental fire department. The legislation goes on to define intermix communities as those developed areas where human development is scattered throughout a much larger natural landscape and where there is no clear boundary between the two. Development densities within intermix areas range from sites where structures are simply very close together to those locations where there is only one structure per 40 acres. An alternative definition specifies 28 to 250 people per square mile in areas where fire protection districts funded by various taxing authorities provide structural and wildland fire protection. In addition, National Fire Plan provisions attempt to address the issue of large scattered communities with significant areas of undeveloped wildland or open space areas that are surrounded by urban environments. In these "occluded communities," wildlands and their associated fuels are surrounded by relatively intense urban development.

In evaluating the fire hazard of each of the above types of development scenarios, the NFP specifies various factors of analysis that must utilized in identifying at-risk communities. Among these are fire behavior potential, values at risk, and fire and public safety infrastructure. Since the original version of the National Fire Plan was prepared, the definition of Wildland Urban Interface (WUI) areas has expanded to include all urban areas that intermix or interface with wildlands containing contiguous vegetation, not just those managed by the federal government. Also, WUI areas now consist of at least one house per 40 acres, less than 50 percent vegetation, and within 1.5 mile of an area (made up of one or more contiguous Census blocks) over 1,325 acres (500 hectares) that is more than 75 percent vegetated. The minimum size limit ensures that areas surrounding small urban parks are not classified as an interface area. Finally, the minimum density has been changed to one structure per 40 acres (16 hectares). Intermix areas have continuous wildland vegetation, are more than 50 percent vegetated, and have more than one house per 16 hectares.

Finally, the National Fire Plan recognizes that in order to reduce threats from wildfire, rural communities must buffer core urban areas from wildland fire through

gradual manipulation and reduction of fuel volumes at their outer edges. At the present time, these interface areas are defined as inhabited zones within 1.5 miles of wildland vegetation, roughly the distance that firebrands can be carried from a wildland fire to the roof of a house. It captures the idea that even those homes not sited within the forest are at risk of being burned in a wildland fire. As defined in the NFP, the WUI is a buffer zone that extends one and one-half mile out into private or public wildlands from areas that have residences, commercial buildings, or administrative sites with facilities.

These WUI areas consist of an inner buffer one-quarter mile wide (the defense zone) and an outer buffer one and one-quarter mile wide (the threat zone). The actual boundaries of WUI zones are determined locally, based on the actual distribution of structures and communities adjacent to or intermixed with local wildlands. Strategic landscape features such as roads, changes in fuel types, and topography can all be used in delineating the physical boundary of the WUI. Within these zones fuel reduction treatments are designed to protect communities from wildland fires as well as to minimize the spread of fires that might originate in urban areas and spread onto wildland areas. The management objective in the wildland urban intermix zone is to enhance fire suppression capabilities by modifying fire behavior inside the zone and to provide a safe and effective area from which possible future fire suppression activities might be carried out.

10-Year Comprehensive Strategy

In August of 2001, the 10-Year Comprehensive Strategy was released. The Western Governors Association, National Association of State Foresters, National Association of Counties, Intertribal Timber Council, and Secretaries of the Interior and Agriculture joined to endorse a document called "A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: A 10-Year Comprehensive Strategy." The 10-Year Comprehensive Strategy refined the framework of the NFP and established expectations for implementation outcomes, performance measures, and implementation tasks for the four goals of the 10-year Comprehensive Strategy, including:

- Improved Fire Prevention and Suppression
- Reduced Hazardous Fuels
- Restored Fire-Adapted Ecosystems
- Promotion of Community Assistance

Healthy Forest Initiative

In August of 2002, the Bush administration announced the Healthy Forest Initiative (HFI). The HFI is in response to federal agencies concerned with administra-

tive procedures that delay the preparation and implementation of hazard fuels reduction projects in critical areas and that impede the implementation of the NFP. The HFI expedites the administrative procedures for certain hazardous fuels reduction projects by issuing new categorical exclusion categories in order to reduce lengthy environmental and sociological documentation. The new categorical exclusions require the US Forest Service, Department of Interior (DOI), and Bureau of Land Management (BLM) to participate in a public collaboration process with state and local governments, tribes, landowners, and other interested persons and community-based groups in order to identify new project areas and treatments.

Healthy Forest Restoration Act

The Healthy Forest Restoration Act of 2003 (HFRA) contains a variety of provisions to expedite hazard fuels reduction and forest restoration projects on specific types of federal land that are at risk of wildland fire or insect and disease epidemic. The Federal Register of August 17, 2001 provides the latest listing of communities at risk of wildfire in the vicinity of federal lands. Additional communities may have been added since this listing based on later evaluations. The HFRA encourages federal agencies to involve state and local governments and citizens when developing plans and projects for vegetation treatment on federal and adjacent nonfederal lands. The HFRA includes provisions to:

- Establish WUI's one-half mile wide around at-risk communities or within one and one-half mile when mitigating circumstances exist, such as sustained steep slope or geographic features aiding in creating a firebreak. Hazard reduction treatments are given priority within these WUI's.
- Establish WUI's adjacent to evacuation routes for at-risk communities.
- Expedite NEPA review of hazardous fuel reduction projects in WUI's on federal lands.
- Encourage biomass removal and utilization from public and private lands.
- Require using at least 50% of the dollars allocated to HFRA projects to protect communities at risk of wildfire.

The enactment of the HFRA gives new impetus for communities to engage in forest planning. The legislation includes the first meaningful statutory incentives for the USFS and the BLM to give consideration to the priorities of local at-risk communities as the agencies develop and implement forest management and hazardous fuel reduction projects. In order for an at-risk community to take full advantage of this new opportunity, it must first prepare a Community Wildfire Protection Plan.

Endangered Species Act

The Endangered Species Act of 1973 provides for the conservation of ecosystems upon which threatened and endangered species of fish, wildlife, and plants depend. Pertaining to fire and fuels management activities of the federal government, the Endangered Species Act requires federal agencies to insure that any action authorized, funded, or carried out by such agencies is not likely to jeopardize the continued existence of listed species or negatively modify their critical habitat. In addition, the Act prohibits unauthorized taking of endangered species, regardless of the positive benefits of the activity for which the taking occurred. Finally, the Act authorizes establishment of cooperative agreements and grants-in-aid to states that establish and maintain active and adequate programs for endangered and threatened wildlife and plants. These agreements have included funding for fuels reduction and vegetation management activities that protect wildlife habitat from catastrophic wildfire as well as those that promote advantageous habitat that aids in the expansion and sustainability of wildlife populations.

National Historic Preservation Act

The National Historic Preservation Act requires the review of any project funded, licensed, permitted, or assisted by the federal government for impact on significant historic properties. Federal agencies must allow the State Historic Preservation Office and the Advisory Council on Historic Preservation to comment on a proposed project. During the review process, the agency must determine if historic properties exist within the project area. If so, the agency must determine the effects on those properties and seek ways to avoid or reduce any negative effects. The responsible Federal agency first determines whether it has an undertaking that is of a type that could affect historic properties that are included in the National Register of Historic Places or that meet the criteria for the National Register. If such a property exists within the project area, the agency must identify the appropriate State Historic Preservation Officer/Tribal Historic Preservation Officer in order to conduct consultations during the execution of project work. Agencies involved in federally funded projects must also involve the public and other potential consulting parties.

QLG Forest Recovery and Economic Stability Act of 1997

The Quincy Library Group (QLG) Forest Recovery and Economic Stability Act provides a management framework for the Lassen and Plumas National Forests along with the Sierraville District of the Tahoe National Forest. The regulations developed in the QLG directs managers of these federal lands to conduct 40,000 to 60,000 acres of

strategic fuels reduction in defensible fuel breaks per year during a five year period. The Act also directs Forest Service silvicultural staff to implement group selection and individual tree selection silviculture on an area-wide basis in order to achieve an all age, multi-story, fire resilient forest. In addition, guidelines have been established for the protection of riparian areas, and the Act protects California Spotted Owl sites through the prohibition of harvesting trees greater than 30 inches. The most significant impact of the QLG on Lassen National Forest lands within the Tehama eastside fire planning area is the prohibition of road building, timber harvesting, construction of Defensible Fuel Profile Zones, and any riparian management that involves road construction or timber harvesting within lands classified as "Off Base or Deferred." Almost all of the Lassen National Forest lands within the Tehama eastside fire planning area, including some timber lands, is unavailable for mechanical fuels reduction work, which would require the construction of roads or significant alterations to area landscapes.

Federal Emergency Management Agency Disaster Mitigation Act of 2000 Multi-Hazard Mitigation Plan

The Disaster Mitigation Act of 2000 (DMA 2000) is an attempt by the federal government to reduce the vulnerability of states, tribes, and local governments to natural hazards and potential natural disasters. The DMA 2000 act is also an attempt to improve the cost effectiveness of disaster assistance funds by improving the ability of communities to withstand natural disasters and to efficiently respond when they occur. To accomplish this, the Federal Emergency Management Agency will fund an array of pre-disaster mitigation projects if communities can demonstrate that they have a plan in place that recognizes what the potential local disasters are and how the community will prepare for and respond to such impacts. This process closely follows the structure and intent of the Community Wildfire Protection Plan template. As a result, through the preparation of the Tehama East community Wildfire Protection Plan, the requirements of the DMA 2000 multi-hazard plan wildfire component are fulfilled.

California Fire Plan

The California Fire Plan was prepared by the State Board of Forestry and CAL FIRE. The plan provides a framework to assist communities in funding, development, and implementation of Fire Safe plans and Defensible Fuel Profile Zones (DFPZ). The overall goal of the California Fire Plan is to reduce total costs and losses from wildland fire by protecting assets through pre-fire management activities and by increasing initial attack success. The California Fire Plan has five strategic objectives:

- Create wildfire protection zones that reduce the fire risks to citizens and fire fighters.
- Assess all wildlands throughout the state, including all State Responsibility Areas (SRA's). Assessments will include an analysis of all wildland fire service providers – federal, state, and local governments and private. The analysis will identify high risk/ high value areas, and determine who is responsible, who is responding, and who is paying for wildland fire emergencies.
- Identify and analyze key policy issues and develop recommendations for changes in public policy. Analysis will include alternatives to reduce total costs and losses by increasing fire protection system effectiveness.
- Create a strong fiscal policy focus and monitor the wildland fire protection system in fiscal terms. This will include all public and private expenditures and economic losses.
- Translate the analyses into public policies.

Agency and Resource Management Entity Fire Planning Efforts

In addition to the polices developed in the broad strategic plans such as the National Fire Plan, DMA Multi-Hazard Mitigation Plan and the California Fire Plan, various agencies and resource management entities have prepared fire plans for specific areas or particular resources. These planning endeavors generally take the form of:

- Resource management plans which include a discussion of fire and its impact on specific resources and
- Agency fire management plans which address fire organization and logistical issues as well as the implementation of fire policies developed in broader resource planning documents.
- The content of such plans and their impact on the fire environments and fire protection efforts of eastern Tehama County are discussed below.

Lassen National Forest Land and Resource Management Plan

This forest wide planning document discusses management objectives and issues for all resource areas including fire within federally managed and privately managed acreage within the boundaries of the Lassen National Forest. Among its objectives, the Lassen National Forest Land and Resource Management Plan (LRMP) establishes an array of goals for the forest which are expected to result in the development of desired conditions in various forest ecosystems up to 50 years in the future. A number of these goals relate directly to the management and use of fire. The plan also

establishes goals and objectives for commodities and services to be provided as well as prescribed standards, guidelines, and practices that are expected to achieve the goals and objectives.

In conjunction with the preparation of the Lassen National Forest Land Resource Management Plan, an array of standards and guidelines have been established that provide tangible management direction in accomplishing the policy objectives established in this planning document. These standards and guidelines assure that the Lassen National Forest LRMP is implemented in conformance with U.S. Forest Service regional management direction as well as the legal requirements of various environmental laws such as the Clean Water Act, the Clean Air Act and Endangered Species Act, among others. A number of these implementing guidelines apply directly to the management and use of fire or indirectly in terms of how other resources are managed in relationship to fire. Due to the size of the Lassen National Forest, fire management and fire related decisions made within its boundaries can have a significant impact on public and private land management outside the forest's boundaries.

Lassen National Forest Fire Management Plan

On a yearly basis, fire management staff of the Lassen National Forest prepare a forest-wide fire plan which describes the elements, objectives, strategies, and resource considerations of the forest's fire program. This planning document provides a course of action for the Lassen National Forest's fire and fuels management program in order to achieve the resource management goals and objectives developed in the forest's Land Resource Management Plan. In addition, the fire plan translates strategic LRMP direction into specific fire and fuels tactical options for each of the forest's fire management units. The fire planning document also describes the annual fire program that has been determined to most efficiently meet the forest's fire management direction in terms of fire organization, facilities, equipment, staffing needs, activities, timing, location, and related costs. In addition, each national forest with burnable vegetation subject to wildfire must review, revise, and approve a fire management plan by February 1, and the fire planning document aids the Lassen National Forest in complying with the requirement. In addition to implementing fire related goals within national forest boundaries, the Lassen National Forest fire plan establishes a number of goals that address fire and fuels management issues in the interface area between private and national forest lands. In broad terms, the following criteria are used in developing and evaluating fuels projects:

- Communities at risk,
- Municipal watersheds, and
- Threatened and endangered species.

More specifically, the following policies have been established for evaluating fire and fuels management projects both within the national forest and on those lands adjacent to its boundaries:

- Fire fighter and public safety is the first priority in every fire management activity.
- The role of wildfire as an essential ecological process, and this natural change agent will be incorporated into the planning process.
- Fire management programs and activities support land resource management plans and their importance.
- Fire management programs and activities are economically viable, based upon values to be protected.
- Fire management programs must be based upon the best available science.
- Fire management activities incorporate public health and environmental quality considerations.
- Federal, tribal, state, and local interagency coordination and cooperation is essential.
- Standardization of polices and procedures among federal agencies is an ongoing objective.
- Conduct fire management planning, preparedness, suppression, monitoring, research and fire use on an interagency basis.
- Integrate fire management planning with other types of forest planning whenever possible.
- Encourage property owners to take an active role in establishing and maintaining their own fire prevention and safety measures in the Wildland Urban Interface.
- Provide technical and financial assistance to state, tribal, and local cooperators for fire management planning and activities in the Wildland Urban Interface through Cooperative Fire Protection programs.
- Assess, analyze, and plan for fire prevention and protection in conjunction with other federal, tribal, state, county, and local government entities as well as with community and citizens groups.
- Encourage and participate in partnerships with citizens or use community centered approaches to manage fire risks in Wildland Urban Interface areas.
- Integrate Wildland Urban Interface considerations into land management planning as well as into program project plans.
- Implement fuel modification projects to mitigate fire hazards.

Bureau of Land Management Redding Resource Management Plan

In June of 1993, the Bureau of Land Management's Redding Field Office prepared a fifteen year strategic plan for the agency's Redding Resource Area. The planning process and the regulating document provide a strategy as to how and where the agency will administer public lands under its jurisdiction within the Redding Resource Area. This administrative unit of the BLM consists of more than 1,000 scattered parcels totaling 247,500 acres located within Siskiyou, Shasta, Trinity, Tehama, and Butte Counties. A portion of this land base is located within BLM's Ishi Management Area which includes a portion of the Tehama eastside fire planning project area. Based upon public input, the management plan focused on four key issues:

- *Land Tenure Adjustment*: This issue focuses on the donation, trade, or outright sale of BLM properties that are isolated, have little access, and contain low resource value in order to obtain other properties near larger consolidated tracts of BLM lands that have greater access and resource value.
- *Recreation Management*: The focus of this issue is to determine what mixture of recreation activities on BLM lands will be encouraged or discouraged.
- *Access*: The primary concern of this issue is to determine where access rights will be acquired by the federal government for the general public in order to expand utilization and management of BLM parcels.
- *Forest Management*: The emphasis of this issue is for the agency to make a determination as to which parcels in the Redding Resource Area will be managed for commercial timber production as well as to establish revised timber sale quantities from these lands.

Of these four issues, Land Tenure Adjustment, Access, and Forest Management are the planning concerns most directly related to the management of fire and wildland fuels on BLM lands. At the present time, poor access makes it difficult for BLM personnel or those of cooperating fire agencies to access lands under BLM control. As a result, fire beginning on these lands has a greater opportunity of escaping onto adjoining private lands. Consequently, there is a direct correlation between land tenure, access issues, and the successful control of wildfire on these public lands. In addition, the 1993 Land Management Plan established that all fires occurring within BLM lands will be suppressed. At the same time it was determined that improved connectivity of federally managed lands would result in better attainment of this goal.

Bureau of Land Management Redding Field Office Fire Plan

In order to implement the fire related goals of the Redding Resource Area Land Management Plan, the Bureau of Land Management completed preparation of the 2004 Fire Management Plan. This more specialized planning document identifies the direction for fire and fuels management within the Redding Resource Area. The plan also identifies and integrates all wildland fire management guidance, direction, and activities required to implement national fire policy. Specifically, the Fire Management Plan develops and recommends strategies for:

- Wildland Fire Suppression
- Wildland Fire Use
- Prescribed Fire
- Non-fire Fuels Treatments
- Emergency Stabilization and Rehabilitation
- Community Assistance/Protection

Within the Ishi and Sacramento River Fire Management Units, a number of local objectives and recommendations have been established for the BLM's fire and fuels management program. Most important among these is the protection of the public, fire fighters, private property, and public infrastructure. More specifically, the plan establishes the goal of providing 100% protection of values at risk from wildfire. The plan also establishes a goal of full protection for those at-risk communities located adjacent to BLM parcels, a number of which are located in the Tehama East Community Wildfire Property Plan area. Finally, the BLM fire plan recommends the utilization of natural and manmade barriers such as roads, trails, rock outcroppings, and riparian areas during wild fire suppression. As a means to obtain these goals, the Redding Area Fire Management Plan recommends burning between 10,000 and 15,000 acres of wildlands per decade using controlled natural wildfire and prescribed burns.

United States Fish and Wildlife Service Fire Planning Policies

The Department of Interior (DOI) fire management policy requires that all burnable acres on USFWS lands have a Fire Management Plan (FMP) which details fire management guidelines for operational procedures and values to be protected and/or enhanced. These FMP's are designed to assist in the protection of individual site facilities, resources, employees, and adjacent communities at risk to wildfire. Fire management plans are tiered from larger programmatic-level resource management plans such as:

- *Refuge Comprehensive Conservation Plan (CCP)*: This planning document addresses a number of broad resource planning and conservation issues. A number of these relate to fire and fuels management concerns:
    - Development and management of habitat for endangered, threatened, and/or sensitive species;
    - Protection and development of habitat for neotropical migratory land birds;
    - Preservation of natural diversity and abundance of flora and fauna;
    - Development of feeding and resting habitat for migratory and wintering waterfowl and other water birds;
    - Development of opportunities for understanding and appreciating wildlife ecology and the human role in the environment;
    - Providing high quality wildlife dependent recreation and education; and
    - Providing an area for compatible management oriented research.
- *Habitat Management Plan (HMP)*: This type of directed planning document focuses specifically on the development, protection, and sustainability of habitat resources found within the wildlife area.

Unit-specific fire management plans provide site-specific information and guidance regarding fire protection as well as fire and fuels management on specific USFWS properties. Those plans currently in effect on USFWS properties within Tehama County include the following programs.

2001 Red Bluff Field Office Fire Management Plan.

The U.S. Fish & Wildlife Service Red Bluff Field Office was established in 1978 in order to promote and support agency efforts to restore Pacific salmonids. The facility provides biological expertise and assistance to various entities seeking to conserve and protect the ecosystems within the North Central portion of California's Central Valley. The facility's fire plan was developed with the following goals:

- Provide for firefighter and public safety.
- Reduce human caused fire on facility lands.
- Ensure appropriate suppression response capability.
- Increase the use of prescribed fire in managing fuels .
- Specific objectives developed in the facility's fire plan include:
    - Promote a fire management program and control all wildland fires.
    - Provide for the protection of life, property, and resources from wildland fires at cost commensurate with resource values at risk.
    - Use appropriate suppression tactics sand strategies that minimize long term impacts of suppression actions.

- Use mechanical treatments, prescribed fire, and pile burning to manage fuels and vegetation.

The fire management program at the Red Bluff facility focuses on the suppression of fire and the protection of lives and structures. Managing fire resource benefits is not a priority under the plan; as a result, appropriate suppression actions are taken during all fire events. Priority in protection measures are given to on-site facilities along with homes and other structures on adjacent properties. Priority is also given to protecting sensitive species that may be found on the site. As a result of this focus on protection and suppression of wildfire, USFWS priority is given to those projects which protect resources located on lands managed by the Red Bluff Field Office.

Sacramento River National Wildlife Refuge Complex Fire Management Plan

The Sacramento National Wildlife Refuge Complex (SRNWRC) was established in 1989 under the authority of the Endangered Species Act. The refuge was created in order to preserve, restore, and enhance habitats and species that make up the Sacramento River ecosystems. The refuge consists of 18,000 acres along both banks of the Sacramento River between Red Bluff and Colusa. The SRNWRC fire plan was developed based upon the following assumptions and considerations:

- Fire is an essential part of maintaining the refuge's native biotic communities.
- Prescribed fire has positive effects on vegetation and wildlife when conducted during the appropriate burning conditions, time of year, and plant phenology, using the proper techniques.
- Uncontrolled wildland fire has the potential for negative impacts (out of season, increased intensity, fire trespass, burning onto neighboring properties).
- Use of Minimum Impact Suppression Tactics (MIST) concept to minimize environmental damage.

The fire planning document was prepared in order to meet these primary objectives:

- Protection of life, natural resources, and public and private property;
- Use of prescribed fire for hazard fuel reduction and habitat improvement;
- Safe suppression of all wildland fires using strategies and tactics appropriate to safety considerations and values at risk;
- Provide for and protect habitat for trust species, especially endangered, threatened, and species of concern;
- Use prescribed fire to reduce hazard fuels and improve habitat conditions;

- Prevent human-caused wildland fires; and
- Public education regarding fire management.

Fire management programs are coordinated by the Zone fire management team and various resource staff members, although final management decisions are made by site or complex managers. Fire project planning and implementation are directly supervised by the Zone Fire Management Officer. The Sacramento Fire Zone maintains a fire staff consisting of a Fire Management Officer, Wildland Urban Interface Coordinator, Fire Operations Supervisor, Engine Captain, and crew.

Planning strategies and objectives are considered in the preparation of the Zone's Annual Work Plan and development of annual budget requests. Proposed actions, alternatives, and environmental analyses in compliance with NEPA will be developed from annual strategies and will be used in the development of site-specific projects occurring on USFWS properties. Annual work plans/project lists will be provided to the applicable Community Wildfire Protection Plan team representatives and other interested parties for review, prioritization, and amendment/adoption into the applicable Community Wildfire Protection Plan(s).

Community Wildfire Protection Plans

The process of developing a Community Wildfire Protection Plan (CWPP) such as the Tehama East Community Wildfire Protection Plan is a collaborative effort by citizens and agency personnel that identifies and describes the wildfire situation of communities located within those wildlands that are impacted or have the potential to be significantly impacted by wildfire. This broad look at a community's wildfire situation includes a description of the area's fire ecology as well as the interrelationships and impacts that occur between fire dominated ecosystems and human occupation of these landscapes. More specifically, community fire plans identify and describe natural and manmade assets at risk of wildfire found in the local area as well as infrastructure in place to protect them. This infrastructure is then analyzed in order to determine its effectiveness in protecting local at-risk assets, and improvements are developed to increase the usefulness of these protective measures.

Community Wildfire Protection Plans are the citizens' opportunity to replace broad regional and national fire plans with local plans that meet the concerns and needs of the immediate community. Under current planning requirements for CWPPs, the at-risk community determines and defines the boundaries of the WUI which protects the citizens and development found within a community. The use of the community as the determiner of the WUI protection area supersedes the default distance limitations of one and one-half miles from the community as specified in the

Healthy Forest Restoration Act of 2003. This community plan is not constrained by standards and guidelines such as canopy closure, tree size limitations, and basal area retention standards. In addition, the plan is not subject to the legal challenges that frequently encumber federal land management plans. Significantly, those communities with wildfire protection plans receive priority for funding of fire and fuels management projects as well as those projects that improve fire safety. Some of the significant components found in many CWPP's include:

- Identification of at-risk communities within or adjacent to wildlands that are at risk of impact by large-scale wildland fire;
- Identification of federal and nonfederal areas suitable for hazard fuel reduction treatments that will result in the protection of identified at-risk communities;
- Prioritization of fuel reduction treatments;
- Recommendations as to appropriate types and methods of fuel reduction treatments to be applied on both federal and nonfederal land;
- Recommendation of measures that will reduce structural ignitability throughout identified at-risk communities; and
- Development of a fire plan within the context of collaborative agreements and in consultation with interested parties and federal land management agencies having management responsibilities within the vicinity of identified at-risk communities.

Tehama-Glenn Fire Safe Council

In the spring of 2000, the Tehama-Glenn Fire Safe Council (TGFSC) was formed in order to act as an advisory group on issues related to wildfire and fire safety in the Tehama County and Glenn County area. Due to the rural nature of Tehama County, the TGFSC focuses primarily on fire management, fuel reduction, and fire prevention issues associated with wildlands and urban-interface areas on a landscape basis. Among these area-wide issues are:

- Smoke management and self regulation,
- Coordination on prescribed burning,
- Coordination on wildfire incidents,
- Public education,
- Fire prevention education,
- Fire training for land managers,
- Prescribed and emergency response fire capacity,
- Rehabilitation after wildfire incidents,
- Fuel break and vegetation treatment projects,

- Monitoring of regulations, and
- Funding for projects.

The TGFSC's main objective is to work with other established fiscal agents in obtaining funding for projects relating to fire management, fuel reduction, and fire prevention. TGFSC also acts as a conduit for information on fire issues as well as a forum for discussion about how to achieve relative fire safety in the bi-county area. To accomplish this, the TGFSC has established two primary objectives:

- Provide a forum for sharing information and coordinating fire management and fuels reduction efforts among people involved in land and fire management in the Tehama County and Glenn County area.
- Provide a forum between public agencies and private organizations that share a common goal in wildfire prevention and catastrophic losses. The TCFSC has a vision that through the expertise, technical and financial resources, and communication within this group, natural and manmade resources within the county can be protected through a collaborative effort.

The group consists of representatives from the United States Forest Service, United States Bureau of Land Management, U.S. Fish and Wildlife Service, National Park Service, California Department of Forestry and Fire Protection, California Department of Fish and Game, Tehama County Air Pollution Control, Tehama County Planning Department, Tehama County Public Works Department, Glenn County Planning Department, Glenn County Public Works Department, The Nature Conservancy, Denny Land and Cattle Company, Sierra Pacific Industries, Collins Pine Company, Crane Mills, and the Quincy Library Group. Private landowner representation is generally provided through local watershed conservancies or other landowner groups. Among those providing significant contributions to the Tehama-Glenn Fire Safe Council are the Cottonwood Creek Watershed Group, Deer Creek Watershed Conservancy, Battle Creek Watershed Conservancy, Mill Creek Conservancy, and Sunflower CRMP. In addition to its participation as a member of the fire council, the Tehama County Resource Conservation District contributes a paid staff member to coordinate council activities as well as to provide planning and GIS services.

From past discussions, a number of suggestions were developed about specific project work that could achieve TGFSC goals. Significant among these ideas was the development of an overall framework for fire and fuels planning which would look at issues on a countywide basis. At the present time, land management entities and fire planning organizations within Tehama County operate under an array of organizational agenda. This situation hinders the development of a more unified wildfire response strategy among public and private stakeholders. It also impacts the effective

coordination of complex fire management issues in a unified, cohesive manner and at ecologically relevant scales. Council members determined that in order to develop information specific enough with which to develop fire management and fuels projects as well as to garner stakeholder support, a countywide planning process would need to be divided into geographic regions having similar landscapes, fuel conditions, and management objectives. As a result, TGFSC decided to divide Tehama County into westside and eastside planning areas.

Over the past few years, CalFire and TGFSC have been attempting to coordinate and integrate the array of fire planning and mitigation efforts taking place throughout Tehama County through the development and continued refinement of the CalFire Tehama -Glenn Unit Plan. This multi-county fire planning document coordinates the policies, planning efforts, and project work developed in the Tehama West Community Wildfire Protection Plan, the Tehama East Community Wildfire Protection Plan, the Manton community fire planning discussions, the Deer Creek Fire Management Framework, and the fire management agenda of the CalFire organization. As a result of this coordination effort, an increase in the effectiveness and cost efficiency of fire and fuels management projects developed throughout Tehama County is expected. In addition, the Tehama-Glenn Unit Plan document will also meet the requirements of the Federal Healthy Forest Initiative, as well as the compliance criteria of the Disaster Mitigation Act of 2000, the National Fire Plan, and the California Fire Plan. Once this multi-county planning document is completed, local land management entities will be able to apply for federal and state funding for fire and fuels management projects.

Fire Prevention Regulations and Enforcement

The laws and regulations concerning fire prevention on private lands in Tehama County are enforced primarily by CalFire and Tehama County. Pertinent sections of the California Public Resources Code are found in **Appendix A**, applicable portions of California Government Code 51182 are shown in **Appendix B**, and those portions of Title 14 California Code of Regulation (14 CCR) applicable to fire safety and wildfire are shown under **Appendix C**. Finally, starting in January 2008, revisions to the California Building Code (CBC) **Appendix D**, related to building products that can be used in the Wildland Urban Interface (WUI), become effective. Among the changes to the Building Standards and Materials for Building Code (Chapter 7A of the CBC) are new regulations that required building products to comply with specific standards if structures are build within very high fire hazard severity zones as mapped by CAL FIRE. A map of these areas can be found at:

http://firecenter.berkeley.edu/fhsz/

These new code provisions include provisions for ignition resistant construction standards in the wildland urban interface. The updated fire hazard severity zones will be used by building officials to determine appropriate construction materials for new buildings in the wildland urban interface. The updated zones will also be used by property owners to comply with natural hazards disclosure requirements at time of property sale.

III. Project Background

Tehama East Community Wildfire Protection Plan

In late 2005, the Tehama County Resource Conservation District completed the Tehama West Community Wildfire Protection Plan, which addressed fire management, wildland fuels, and fire safety concerns within the grasslands, oak woodlands, and forested landscapes on the west side of the Sacramento River. The plan's project area encompassed that portion of western Tehama County from the south fork of Cottonwood Creek on the north to the north fork of Stony Creek on the South. From east to west, the project area encompasses the Sacramento River and the crest of the Coast range within the Mendocino National Forest. Beginning in late 2005 and continuing through 2007, the Tehama County Resource Conservation District prepared the Tehama East Community Wildfire Protection Plan, which encompasses the area from the Battle Creek watershed at the northern boundary to Rock Creek and Hoag Slough on the southern boundary. The plan's area of analysis also included the chaparral, grasslands, and riparian areas between Ponderosa Way to the east and the Sacramento River to the west. Much of the forested land within eastern Tehama County is managed by the Lassen National Forest, Lassen Volcanic National Park and private timberland owners. These forested landscapes are operated under detailed fire and fuels management plans; as a result, these landscapes were for the most part excluded from the Tehama East Community Wildfire Protection Plan process. An exception was the forested area immediately adjacent to Ponderosa Way. These adjacent timberlands both directly impact and are impacted by wildfire and fuels management processes within this project's planning area. Within the primary planning area of the eastern foothills, reduced fire frequencies have resulted in excessive fuel loading that now threatens a number of communities. Along the Sacramento River corridor, numerous important riparian ecosystems are threatened by heavy fuel loading as well as ignition sources caused by the proximity of population centers and other forms of urban development.

Goals of the Tehama East Community Wildfire Protection Plan

The Tehama East Community Wildfire Protection Plan was developed with the following goals in mind:

- Assist the community in identifying and prioritizing areas for hazardous fuel reduction treatments on federal lands and in determining the types and methods of treatment that, if completed, would reduce the risk to the community.

- In a collaborative manner, using an array of local stakeholders, create a regional Community Wildfire Protection Plan that assesses fire related ecosystems and addresses fire related issues and needs on a landscape basis, irregardless of political and administrative boundaries.
- Obtain agreement on the contents of the plan by local and state fire agencies.
- Provide comprehensive wildland fire planning and prioritization of project work that focuses on the protection of at-risk communities and watersheds, or that implement recommendations developed in the planning process and listed in the Community Wildfire Protection Plan.
- Provide a mechanism for federal agencies to provide leadership in the fire planning process and give meaningful consideration to community priorities, and incorporate these federal efforts in the CWPP.
- Open community debate regarding management options.
- Provide communities with maximum flexibility for determining the substance and detail of their plans.
- Merge the goals and objectives of the landowners with the needs and expectations of the community regarding fire risk reduction.
- Coordinate fire protection strategies across property boundaries.
- Improve the natural systems within the county that have developed within fire based landscapes, including:
- Increased stream flows and ground water yields,
- The development of more natural, low seral stage ecosystems,
- Improved forage and habitat for wildlife
- Protection of lands whose primary purpose is for the production of environmental resources, including recreational opportunities.
- Provide funding priority to projects and activities identified in the CWPP and coordinate the grant funding and federal program budgets to achieve the most effective results utilizing limited funding.
- Assist in the identification and federal listing of communities at-risk (CAR) to wildfire.
- Identify structures at risk from wildfire, as well as shortcomings in state, local, and county development and building codes.

Process Overview and Methodology

Professional and Community Input Processes. The Tehama East Community Wildfire Protection Plan project was designed to allow the incorporation of significant professional and community input. At the project's outset, a core workgroup was

created to identify significant fire and fuels management issues within the planning area as well as to develop a project proposal, which was submitted by the Tehama County Resource Conservation District to the California Fire Safe Council and the Tehama County Resource Advisory Committee for funding consideration. Members of the group included staff from United States Fish and Wildlife Service (USFWS), CalFire, The Nature Conservancy, and the Tehama County Resource Conservation District. With funding in place, the workgroup developed a Technical Advisory Committee (TAC) whose members provided guidance and rigorous technical review of planning processes and project proposals developed to help implement the plan, as well as the planning document itself. TAC members were recruited from the Tehama-Glenn Fire Safe Council as well as among planning area stakeholders. Membership consisted of public and private land managers, regulatory agency personnel, individual landowners, and representatives from landowner organizations and watershed groups. A number of community meetings were held in order to introduce the fire planning project and its process to the general public. Attendance was sparse and input minimal. As a result, outreach and community input efforts were focused on specific landowners who expressed interest in the planning project and who were forthcoming with questions, comments, and concerns.

Once the draft planning document was completed, comments were received from the TAC and incorporated into a draft document that was updated, clarified, and expanded. The final draft planning document was submitted by CalFire to the Tehama County Board of Supervisors for their approval and certification as a formal Community Wildfire Protection Plan. In order to assure wide distribution of the information contained in the plan, copies were distributed to public agencies, the academic community, public libraries, and the general public. The document was also posted on the Tehama County Resource Conservation District's website as well as the Western Shasta Resource Conservation District's Watershed Information Model website.

Planning Methodology

The methodology used in developing the Tehama East Community Wildfire Protection Plan consisted of the following steps:

- Collect available information pertaining to the local natural and developed environment, fire hazards, wildland fuels, assets at risk, and local fire policies, as well as currently in place fire protection features and infrastructure, in written, digital, and GIS formats. Included among this information were planning area demographics, ecological communities, topography, hydrology, fuel types, community infrastructure, and fire history. Also

collected was information pertaining to fire related regulations along with agency polices that impact land management and fire project implementation within eastern Tehama County.

- Locate existing fuel reduction projects within the eastside area.
- Obtain input from area landowners, land managers, and other stakeholders regarding undocumented assets at risk and fire protection infrastructure.
- Verify fuel types, assets at risk, and project work related to fire management and fuels reduction efforts.
- Develop maps that identify fuel types, assets at risk, and fire protection infrastructure that is planned, in process, or in place throughout eastern Tehama County.
- With stakeholder input, assess information pertaining to at-risk assets and fire protection infrastructure in order to develop projects and strategies to improve the protective capacities of the eastside area.
- Develop a list of recommendations for fuel reduction and fire safety projects. Encourage ongoing maintenance of in-place projects in order to protect the network of fire protection infrastructure. Identify funding sources and landowner assessment opportunities for project development and maintenance.

The Tehama East Community Wildfire Protection Plan was developed using current fire management data obtained from CAL FIRE, that agency's Fire and Resource Assessment Program, the U.S. Forest Service, and other public and private organizations. Recommended fuel reduction project locations were developed from a combination of analyses using existing geographic information; consultations with fire professionals of CalFire, USFS, BLM, and Tehama County Fire Department; members of the Tehama-Glenn Fire Safe Council; and meetings with local landowners and other private land stakeholders.

Fire and Fuel Risk Strategy and Mitigation Project Development Summary

The problems facing eastern Tehama County in connection with the threat of damaging wildfire is multifaceted. In addition to endangering the lives of residents and fire fighters as well as public and private property, these wildfires threaten the economy and natural resources of the eastside area, and Tehama County as a whole. Efforts to protect the residents and resources of the area come at a considerable public expense. In order to reduce the occurrence and negative impacts of wildfire, solutions to the problem must be multifaceted as well. Development of measures to reduce both

wildfire risk and the impact of fire on local landscapes is a significant component of the Tehama West Community Wildfire Protection Plan. These mitigation measures take a number of forms, from very specific and localized to broad based, countywide efforts. They also range from basic "on the ground" fuels manipulations to landscape scale planning efforts, including changes to state and local laws that have a negative impact on fire hazard and fire safety conditions within Tehama County. Among these projects are those that are simply proposed for funding or are in the early stages of design. Some of the project and initiative proposals involve efforts that are in process or completed but can be expanded, redesigned, or continued in order to improve the fire and fuels management situation in eastern Tehama County.

The projects proposed in this plan generally fall into three categories: organizational improvements, infrastructure development/improvements, and fuels reduction/ vegetation manipulation. Projects in the organizational improvement category included improvements in the structure and organization of those entities that provide fire protection services. Also included are efforts to improve the organization and operation of nongovernmental entities that develop, promote, and advocate for changes in the human environment that impact fire related issues. In Tehama County, these types of nongovernmental entities include Fire Safe Councils, watershed groups and other community advocacy organizations. With regard to infrastructure development/improvements, projects include construction and improvement of those manmade features that provide fire safety and fire control. Fuels reduction and vegetation manipulation projects are efforts that attempt to impact the current arrangement and composition of vegetation and manmade fuels at a single location or throughout an entire landscape. More specifically, the project initiatives developed and proposed in the Tehama East Community Wildfire Protection Plan involved one or more of the flowing classifications of project work:

- Fuels Reduction and Manipulation. This category of mitigation effort entails some form of vegetation management, which normally has the most immediate impact on fire behavior and intensity. Included are simple fuels reduction projects over large areas or the development of fuel breaks that will significantly impact a potential wildfire in a very specific manner. These reductions in hazardous fuels must be completed in a strategic manner that first addresses wildfire threats to important at-risk assets. Retuning natural fire regimes that will maintain only low intensity blazes throughout the county would be desirable however; current development within the east side area prevents the widespread reincorporation of naturally occurring wildfire back into the county's landscapes. A combination of methods

utilizing fire, mechanical treatments, and chemicals as control mechanisms are required in order to maintain a fire safe environment within the confines of urban development. Of equal importance is the establishment of financing mechanisms to maintain fuel breaks and other fuel maintenance projects once these have been completed. Currently, grant funding is used extensively to develop fire control and fuels reduction projects. These sources can sometimes be unreliable in providing long term funding for upkeep of these infrastructure improvements. Financing mechanisms such as property tax assessments, line items in the Tehama County Public Works Department budget, user fees, and others financing mechanisms need to be considered in order to provide reliable permanent funding of these important public works projects.

End Products of Fire Planning

Through the Tehama East CWPP process, a considerable amount of knowledge and insight was developed regarding the natural and manmade resources found within eastern Tehama County. The process also shed useful light on the threats from catastrophic wildfire facing the area's communities and resources. In addition, a number of tangible end products were developed which are expected to aid in future efforts to better manage wildfires and to reestablish more natural, beneficial fire regimes within the county's eastside landscapes, including the following:

- A Community Wildfire Protection Plan covering 500,000 acres of grass-lands, chaparral, oak woodlands, and streamside forest in eastern Tehama County and that portion of Shasta County located within the watershed of the north fork of Battle Creek. The planning process follows the California Fire Alliance template for preparing Community Wildfire Protection Plans. Out of this planning effort, a number of improvements to the local wildfire situation is expected, such as:
- A unified wildfire response strategy among stakeholders developed through a wildfire risk assessment based upon maps that delineate natural fire management units and access routes as well as an accompanying database listing assets at risk and landowner contact information by fire management unit;
- Improved efficiency in the use of fire management resources between partners with common goals that outline collaborative efforts among partners;

- Identification, cataloging, and risk assessment of various natural and manmade assets at risk from wildfire;
- Identification and cataloging of in-place measures to protect these assets and determine their vulnerability;
- Identification and assessment of gaps and shortcomings in protective measures, development of improvements and additions to increase effectiveness in protecting at risk assets;
- Determination of the adequacy of eastside community WUI areas and if necessary modifying their boundaries in order to focus financial and other resources to those urban areas at greatest risk of wildland fire; and
- Incorporation of the planning requirements established in the provisions of the Disaster Mitigation Act of 2000 as well as an array of innovative ideas developed in local, smaller-scale planning efforts.

Risk Assessment and Fire Plan Document

At the core of the Tehama East CWPP process is the community risk assessment and fire planning document. Through the risk assessment process, vegetative fuels were evaluated in order to identify specific areas where conditions are such that, if wildland fuels were ignited, they would pose a significant threat to community and watershed resources. The assessment and fire plan also aided in the identification of natural and manmade assets at risk from catastrophic wildfire as well as their vulnerability to the adverse impacts of fire. In addition, this fire planning process helped to identify and assess currently in place infrastructure and natural features that help to protect area resources. If gaps or shortcomings in this protective infrastructure were found, the planning process was used to identify measures that would improve current protection measures to a degree of detail that would expedite the preparation of work scopes. Given the often limited amount of financial and other resources available for executing project work, an implementation strategy was developed for each planning area in order to prioritize the execution of fire protection projects.

Manton Community Wildfire Protection Plan

Working in tandem with the Tehama East Community Wildfire Protection Plan process, the Manton Fire Safe Council (MFSC) is in the process of developing a focused CWPP for the Manton Community and its surrounding area. Along with the creation of the Manton Fire Safe Council (MFSC) itself, these efforts were a result of the Manton Fire which destroyed much of the Manton Community as well as adjacent ranch, vineyard, and timber lands. Once completed, the Manton CWPP will identify specific

at-risk community assets as well as in place facilities and features that protect these important community resources. The MFSC is also working with CAL FIRE, Lassen National Forest, and Lassen Volcanic National Park in developing additional project work and infrastructure that will improve the protection of watershed assets found within the larger Battle–Creek Manton Planning Unit. Significant among these assets are the aquatic and riparian resources of Battle Creek's north and south forks along with the environmental resources found within surrounding sub watersheds. Once completed, the Manton CWPP will be incorporated as an appendix to the Tehama East Community Wildfire Protection Plan.

Vegetation Mapping and Modeling Project

Much of the Tehama East CWPP project area is very remote and unpopulated and contains an array of unique, largely unfragmented landscapes, including blue oak woodlands, foothill chaparral, grasslands, and vernal pools. The plant and animal communities found within the Lassen Foothills portion of Tehama County have been adapted and developed under regimes of periodic wildfires that burn irrespective of landowner boundaries. At the present time, there are over fifteen different fire management plans that cover various portions of the landscape. While small-scale planning efforts have resulted in several successful fire safety projects (such as shaded fuel breaks), coherent fire management policy and practices leading to projects focusing on ecological health and improvement to wildlife habitat are lacking across this matrix of public and private lands.

To better understand and address landscape health and the fire ecology issues found in the eastside of Tehama County, the Lassen Foothills Vegetation Mapping and Modeling Project was developed and initiated during the planning process and will be completed in the spring of 2009. The major components of this project include:

- A vegetation classification at the alliance-level with crosswalks to wildlife habitats;
- A detailed map of current vegetation;
- Development of state and transition models for each vegetation type in order to identify reference conditions and historic fire regimes;
- A fire condition class map for vegetation to identify the departure from "natural" conditions; and
- Incorporation of this information into the overall Tehama East Community Wildfire Protection Plan.

The mapping effort will be based upon a new classification system currently being developed by the California Native Plant Society for the southern Cascades and

Sierra Nevada. Development of the state transition models for each vegetation type and the crafting of a fire condition class map will be completed by The Nature Conservancy. These transitions models are expected to aid in the prediction of changes to vegetation resulting from changes in the frequency of fires. They will be based upon models recently developed by the LANDFIRE program of the National Fire Plan. "Condition class" is a measure of the departure of the vegetation from some idealized condition. Land management agencies have focused on current departures from fuels conditions that occurred under historic fire regimes (i.e., before the policies of fire suppression took effect in the first half of the 20th century). The production of condition class maps is expected to assist planners in determining where prescribed fires will be of most benefit.

Map and Database of Natural Fire Management Units

Another major outcome of the Tehama East CWPP is the development of natural fire management units that are based upon topography and natural fire breaks, both of which directly affect fire behavior. Natural fire management units that span multiple agency jurisdictions, such as large drainages and canyons, will facilitate communication between fire agencies, land managers, land owners, and other area stakeholders. Communication between concerned parties is particularly important during wildfire events and the conducting of fuels management projects. As a result, landscape scale fire and fuels management strategies can be developed that reflect ecological realties of the project area. Examples of the use of these fire management units include the identification and cataloging of critical stream segments containing important riparian and aquatic resources. In addition, areas containing threatened and endangered species can be mapped and included in the database in order to assure protection during controlled and uncontrolled burns. Fire management applications include the mapping of watering holes and tanker fills. This kind of resource and wildfire management information will greatly assist out of area firefighting units in managing fires in a manner that promotes expeditious containment and maximum resource protection. With the fire management units delineated and mapped, the process of cataloguing assets at risk and fire management infrastructure into a corresponding database has begun and will continue as information is received from landowners, agency personnel, and other land managers. *(Refer to Figure III-1.)*

Multi-County Map of Fire Related Projects

In order to facilitate the planning process for individuals, independent managers, community groups, and local and regional governmental agencies, the

Tehama County Resource Conservation District has gathered fire related project information for Tehama, Glenn, and Shasta Counties. Project work is represented on separate online maps by individual project numbers. Related project information can be viewed in the project's database file. Both the maps and database can be found on the Tehama County Resource Conservation District website located online at the URL http://www.tehamacountyrcd.org. In order to keep the maps and related database updated each year, TCRCD staff will work closely with CalFire pre-fire engineering staff in gathering current information related to new fire and fuels management projects and in determining progress on in-process work and completed projects. In addition to being incorporated into the digital maps and database, this project related information will be incorporated into the yearly update of the CalFire Tehama –Glenn Unit fire plan and the ongoing update of the Tehama West and Tehama East Community Wildfire Protection Plans.

Using the spatial project information shown on these maps, project planners can visually demonstrate the relationship between their proposed project and those that are in the planning process, in progress, or completed. This information is expected to help those conducting fuels reduction work to demonstrate the value of their projects as they relate to other fuels reduction efforts, thus improving the potential for project approval or funding. Through the combined efforts of various land management entities in reducing fuel hazards, landscape scale protection of area resources can be achieved.

The planning documents, risk assessment process, vegetation mapping and modeling project, and the online map of fire management projects are expected to result in the following outcomes:

- *Improved Fire Regime Condition Class*: This outcome is expected to occur as stakeholders implement prescribed fire and other fuels treatments identified in the community fire plan. In addition, new projects will be developed which will improve wildfire protection and management within the planning area.
- *Reduced hazardous fuels and associated fire risk*: This outcome is expected to be attained as an increased number of acres—including fuel breaks around communities at risk—are treated for hazardous fuels and associated fire risks.
- *Fewer community assets destroyed in wildfires*: The achievement of this outcome is tied to an improved wildfire response plan, reduced hazardous fuels, and improved Fire Regime Condition Class. This will be tracked via CalFire data on wildfire incidents.

- *Improved long-term sustainability of watershed function*: This outcome will be achieved when environmental characteristics such as rates of erosion and invasion of non-native species are reduced. Non-native species frequency is being monitoring by partners involved in rangeland management.

Community Fire Plan Stakeholders

These decision makers convened in order to develop the Tehama East Community Wildfire Protection Plan and to assure its relevance as a tool for local fire and fuels management efforts:

Local Government

The Tehama County Board of Supervisors provided approval of the CalFire Tehama-Glenn Unit Plan which is the umbrella document under which this regional fire planning document is incorporated. Based upon the planning processes established by CWPP procedures, approval of the Unit Plan result in approval of more focused planning efforts once they are certified by county CalFire personnel.

Local Fire Chiefs

The following Fire Agency Chiefs reviewed and provided local fire agency approval of the Tehama East CWPP and its related components:

Tehama County Fire Department:
Chief Gary Durden

Red Bluff Fire Department:
Chief Gerry Gray, Fire Chief

Corning Fire Department:
Chief Robert Pryatel

Tehama County Volunteer Fire Department:
Chief Gary Durden

CalFire unit Chief:
Chief Gary Durden

Project Work Group/TAC Members / Stakeholders

Involved Federal Agencies	Representative
U. S. Forest Service[2]	Tom Garcia
Bureau of Land Management	Tim Bradley
U. S. National Park Service[1]	Scott Isaacson
U. S. Fish & Wildlife Service[2]	Miriam Morrill
Natural Resource Conservation Service	Larry Branham Bob Bailey

Involved State Agencies	Representative
CAL FIRE[2]	John Sprague
CAL FIRE[2]	Kim Desena
California Department of Fish and	Tricia Bratcher
California Department of Transpor-	John Dobson

Interested Party	Representative
California State University Chico[1]	Don Hankins
The Nature Conservancy[2]	Peter Hujik
The Nature Conservancy[2]	Simon Avery
The Nature Conservancy[1]	Rich Reiner
Battle Creek Conservancy[1]	Sharon Gilmore
Manton Fire Safe Council[1]	Sharon Gilmore
Tehama County Bd of Supervisors[1]	Charles Willard
Tehama County Resource Conservation District[1,2&4]	Tom McCubbins
Tehama County Resource Conservation District[3]	Randy Cousineau
Tehama County Resource Conservation District[3]	Catherine Benjamin
Tehama-Glenn Fire Safe Council	Tom McCubbins
Pacific Gas and Electric Company[1]	Neil Fisher
Pacific Gas and Electric Company[1]	Kelly Fredrickson
Sierra Pacific Industries[1]	Mike Mitsel
Collins Pine Company[1]	Eric O'Kelley

1. Members of the Tehama East Community Wildfire Protection Plan Technical Advisory Committee
2. Members of the Tehama East Community Wildfire Protection Plan Project Workgroup
3. Project Staff 4. Project Manager

Other Supporting Individuals and Organizations

Watershed and Conservancy Groups and Resource Conservation Districts

- Battle Creek Watershed Conservancy
- Deer Creek Watershed Conservancy
- Mill Creek Conservancy

Resource Conservation Districts

- Western Shasta Resource Conservation District

Fire Safe Councils

- Manton Fire Safe Council
- Shasta Fire Safe Council
- Shingletown Fire Safe Council

Farming and Ranching Interests

- Denny Land and Cattle Company
- Robert Kersteins/Kersteins Ranch
- Tehama County Farm Bureau

Governmental Agencies

- California Department of Parks and Recreation
- California Department of Fish and Game
- California Regional Water Quality Control Board
- California Department of Transportation
- California Department of Water Resources
- Department of Interior, Bureau of Land Management
- Lassen National Park
- Tehama County Assessor's Office
- Tehama County Department of Public Works
- Tehama County Planning Commission
- Tehama County Planning Department
- Tehama County Farm Bureau
- United States Bureau of Reclamation
- United States Environmental Protection Agency
- United States Forest Service
- Forest Supervisor's Office, Lassen National Forest

Almanor Ranger District, Lassen National Forest
United States National Marine Fisheries Service

Other

Deer Creek Irrigation District
Stanford-Vina Irrigation Company
Sacramento River Preservation Trust
Paynes Creek Volunteer Fire Company
Manton Volunteer Fire Company
Center for Land Based Learning

Community Participation and Collaboration

The Tehama East Community Wildfire Protection Plan planning process was funded through a combination of monetary sources. The California Fire Safe Council in conjunction with the Bureau of Land Management provided a total of $30,000 to this effort, while the Tehama County Resource Advisory Committee through the Lassen National Forest provided another $42,342. With funding in hand, a group of local fire and fuels management personnel along with the Tehama County Resource Conservation District's Project Manager formed a core workgroup which laid out a strategy to complete project work. The group met regularly throughout the planning process in order to assure that the requirements for Community Wildfire Protection Plans were incorporated into all phases of project work. Members of the Tehama-Glenn Fire Safe Council were canvassed on numerous occasions in order to keep abreast of project work occurring within the fire planning area. Community meetings were held in various locations throughout eastern Tehama County in order to garner input from members of the eastern Tehama County community who were not members of the Tehama-Glenn FSC. Out of these meetings came detailed information on local assets at risk from wildfire as well as in place infrastructure that is used to protect these assets. Discussions with community fire and fuels professionals along with interested community members yielded ideas and suggestions as to how current fire protection infrastructure could be expanded or improved to better protect local assets. Suggestions on new protective features were also submitted and incorporated into the planning document and related maps.

Environmental Review

This section of the fire plan discusses the environmental review protocol pertinent to future project work generated through the Tehama East CWPP process.

Except for a small number of high impact projects, it is anticipated that fuels reduction efforts conducted by area stakeholders will require a minimum level of environmental review. This would include an assessment of potential project impacts relative to the Endangered Species Act (ESA), the National Historic Preservation Act (NHPA), and the Migratory Bird Treaty Act (MBTA). As part of this effort, area stakeholders would also need to conduct a review through the California Natural Diversity Database (CNDDB) to verify findings of Special Status Species within a project area, and would need to conduct a literature search of existing information available through the local archaeological clearinghouse (California State University Chico) in order to determine the presence of any archaeological or historic resources within a fuel reduction project site.

If through this review process a particular Special Status plant or animal species is found or an archaeological or historic resource is discovered at a project site, mitigation would be required that would likely include delaying work to another period of the year or physically working around the particular species or cultural resource. Low impact projects, such as chipping, hand piling, and burning around homes, would normally be exempt from environmental review due to the past disturbances resulting from home construction. In all cases, work would stop and a plant or animal survey be conducted if a special status species were found during project work. An archeological site survey would be conducted if a possible cultural site was discovered.

Federal Environmental Compliance Process in Project Execution

National Environmental Policy Act (NEPA)

Since January 1, 1970, federal agencies such as the United States Forest Service and Bureau of Land Management have been directed by the United States Congress to carry out regulations, policies, and programs in accordance with the National Environmental Policy Act (NEPA). As specified in 42 U.S.C 4322; 40 C.F.R. 1500.2, the act requires projects financed through federal grant funding as well as those occurring on federal lands to have some level of environmental review completed prior to execution of project work. As a result, some of the projects currently in process or recommended for implementation in this planning document would be subject to the NEPA process. The parameters of this review would be dictated by federal agencies at the time a grant is solicited.

State Environmental Compliance Process in Project Execution

California Environmental Quality Act (CEQA)

The California Environmental Quality Act is a set of laws designed to develop and maintain a high quality environment and prevent environmental damage. CEQA applies to decisions by state and local governmental agencies that carry out or approve projects that have the potential for causing significant environmental effects. Fire Safe Councils and watershed groups are not governmental agencies with powers granted by the State Legislature or by a local legislative body; consequently, their decisions are not subject to CEQA. If, however, an activity sponsored by such nongovernmental organizations needs approval, financing, or efforts directly undertaken by a state or local public agency, the agency would need to address CEQA compliance with its actions. CEQA compliance responsibility is determined by the state or local public agency in collaboration with the applicant organization and would take the form of a CEQA Exemption, Negative Declaration, or on rare occasions an Environmental Impact Report.

CEQA Exemptions

After a fuels reduction activity has been determined to be a "project" subject to CEQA review, the lead public agency involved in the activity determines if the project is exempt under CEQA guidelines. The project may be exempt if it falls into one of the following categories:

Statutory Exemption: This exemption applies to activities specifically identified by the legislature as being exempt from CEQA review and includes burning permits and Air District permits for smoke management.

Categorical Exemption: This form of exemption would apply to projects that have no possible significant effect on the environment and includes minor alterations to land (Article 19, Sec. 15304). This Section specifically exempts fuels reduction activities within 30 feet (or 100 feet if authorized by a local fire protection authority) of a structure.

Negative Declarations: After a fuels reduction activity has been determined to be a "project" subject to CEQA review and after it has been determined that an exemption is not applicable, the lead public agency may choose to prepare a Negative Declaration if environmental impacts are considered insignificant. This is a written statement based on an Environmental Checklist that describes the reasons that a proposed project will not have a significant effect on the environment and therefore does not require the preparation of an Environmental Impact Report. The Negative Declaration requires a public comment period of 20 days. A Mitigated Negative

Declaration may be required if some impacts are deemed significant but can be resolved in the Environmental Checklist rather than in an Environmental Impact Report.

Environmental Impact Reports (EIR)

Large fuels reduction projects with impacts that cannot be fully addressed in a Negative Declaration must comply with CEQA requirements through the preparation of an Environmental Impact Report. EIRs can be lengthy, expensive and generally involve an analysis of impacts to biological resources, hydrology, air quality, traffic, geology/soils, aesthetics, cultural resources, cumulative impacts, and impacts to other resources as identified through the EIR process. Mitigation measures are developed during the EIR process in order to address impacts created by the projects implementation. Public review and comments are important elements of an EIR. Fuels reduction projects conducted by small landowners generally do not require planning documents subject to CEQA review, unless the project includes removal of timber for commercial sale or involves CalFire or other California public agency administration and/or support. Large property owners such as timber companies, utilities operations and ranchers or groups of small property owners such as homeowners associations or watershed groups may request the support of CalFire in conducting fuels reduction projects through that agency's VMP Program. Resources made available through the VMP program include information on environmental resources in the area that have the potential for being impacted by the project, advice on fuel treatment methods, stand-by fire suppression equipment and manpower, and hand labor for cutting, piling, and burning. The program also provides state indemnification to landowners in the event of a fire escape. CEQA documentation is generally required for each VMP project and is done by CalFire through the preparation of an Environmental Checklist and a Negative Declaration. All CEQA documentation prepared for projects that have received federal funding must be reviewed to ensure the documentation meets the intent of NEPA.

Timber Harvest Plans (THP)

Fuels reduction projects in stands of timber may involve the removal of timber or solid wood forest products that landowners may sell in the open market to recover the costs of fuels reduction work or to achieve a profit. Projects may include the creation of a fire line that removes all timber and vegetation, or "shaded fuel breaks" where understory vegetation and some dominant trees are removed to create areas of discontinuous fuels. These projects would involve the use of heavy equipment to remove the timber and transport it out of the forest. Impacts associated with timber

harvest operations on private timberlands would be addressed in a THP. These plans must be prepared by a Registered Professional Forester (RPF) and must comply with the Rules and Regulations of the California Forest Practice Rules as they apply to THP's. The purpose of the Forest Practice Rules is to implement the provisions of the Z'berg-Nejedly Forest Practice Act of 1973 in a manner consistent with other laws, including among others the Timberland Productivity Act of 1982, CEQA, the Porter Cologne Water Quality Act, and the California Endangered Species Act. The provisions of these rules must be followed by an RPF in preparing THPs, and by the CalFire Director of Forestry in reviewing such plans. The THP process substitutes for the EIR process under CEQA because the timber harvesting regulatory program has been certified pursuant to PRC Section 21080.5. If either CalFire or the Director of Forestry believes that there are significant adverse environmental impacts not covered in existing rules, matters are referred to the Board of Forestry as specified in these rules.

The sale of commercial timber that has been harvested during a fuels reduction project can support future fuel reduction needs through establishment of a trust fund. Monies obtained through the sale of the timber can be used for the future maintenance of a fuel break or for the control of understory vegetation over time. This may be a viable tool for some communities in which many small landowners are involved with a fuel break that extends across their land. Fuels reduction projects that remove trees on private and state timberlands may be exempt from THP requirements under an Exemption process of the California Forest Practice Rules. The cutting and removal of trees in compliance with sections 4290 and 4291, which eliminates the vertical continuity of vegetative fuels and the horizontal continuity of tree crowns, is covered under the THP exemption process. An exemption form must be completed and submitted to the Director of CalFire prior to commencement of operations. Forms can be obtained from CalFire.

State and Federal Regulatory Streamlining Efforts

The sale of commercial timber that has been harvested during a fuels reduction project can support future fuel reduction needs through establishment of a trust fund. Monies obtained through the sale of the timber can be used for the future maintenance of a fuel break or for the control of understory vegetation over time. This may be a viable tool for some communities in which many small landowners are involved with a fuel break that extends across their land. Fuels reduction projects that remove trees on private and state timber lands may be exempt from THP requirements under an Exemption process of the California Forest Practice Rules. The California Board of Forestry has adopted emergency amendments, within the scope of existing legislation

and the Forest Practice Rules (Title 14 CCR, Chapters 4, 4.5 and 10) to provide regulatory relief for expedited fuels hazard reduction of live and dead fuels. These changes in the California Code of Regulations were adopted on June 25, 2004 and provide a process whereby timber harvest conducted in order to protect structures and community assets located within defined WUI areas are relieved from the state's Timber Harvest Planning process. Revised forest practices regulations now allow for filing of an Exemption Form or Emergency Notice instead of a Timber Harvest Plan when harvesting operations are conducted in accordance with conditions specific in the revised regulations. The primary target of these regulations is small timber landowners who often have limited means and capability to complete fuels reduction projects. The goal of this change in the regulatory environment is to expedite those timber harvest projects that reduce the vertical and horizontal continuity of fuels through the manipulation of forest vegetation. The incorporated language requires coordination with an agency approved fire protection plan which has been formalized into the Community Wildfire Protection Planning process.

The California Environmental Quality Act also provides a means by which to expedite timber harvest projects. Section 21080.5 of the Public Resources Code provides for the certification by the Secretary for Resources that state agency regulatory programs shall be exempt from the requirements for preparing EIRs, Negative Declarations, and Initial Studies if the Secretary finds that the program meets the criteria contained in that code section. A certified program remains subject to other provisions in CEQA such as the policy of avoiding significant adverse effects on the environment where feasible. Among these exempted programs are California Forest Practices Act and its regulations for timber harvesting operations by the California Department of Forestry (CAL FIRE) and the State Board of Forestry pursuant to Chapter 8, commencing with Section 4511 of Part 2 of Division 4. In addition, the regulatory program of the State Board of Forestry in adopting, amending, or repealing standards, rules, regulations, or plans under the Z'berg-Nejedly Forest Practice Act, Chapter 8 (commencing with Section 4511) of Part 2 of Division 4 of the Public Resources Code are exempt as well.

At the federal level, consideration of life and property as a priority has resulted in the development of policies and the amendment of regulations as a means to expedite the execution of certain fire and fuels reduction projects. The Healthy Forest Initiative and Healthy Forest Restoration Act offers more streamlined administrative processes for hazardous fuels reduction projects conducted by federal agencies. Among these streamlining efforts are various NEPA exemptions. In addition, the ESA has new guidance including alternate approaches to streamlining Section 7 Consulta-

tion on Hazard Fuels Treatment Projects, evaluating the net benefits of hazardous fuels treatment projects, and the joint counterpart ESA Section 7 Regulations.

IV. Planning Results and Project Prioritization

Based upon research and meetings with project area stakeholders, significant natural and manmade assets at risk from wildfire were identified along with currently in place infrastructure to protect these assets. These sources, particularly conversations with community members, fire managers, and fuels specialists, yielded invaluable information and suggestions regarding improvements and additions to in-place protective resources that would increase the effectiveness of local fire protection measures. The results of these efforts are detailed in the following section entitled "Results, Summaries, and Recommendations."

In recognition of the fact that financial and human resources available for competing fire management projects are limited, a process of prioritization was established in order to focus on those activities which would yield the greatest overall benefit to the residents and landscapes of eastern Tehama County. Categories with which to evaluate proposals were defined and then ranked using a matrix approach. A draft version of the Tehama East Community Wildfire Protection Plan along with the matrix was provided to members of the Tehama-Glenn Fire Safe Council and other eastside stakeholders participating in the planning process. Each category was discussed and defined in detail to ensure that all participants had a similar understanding of the valuation process. Each project was allocated a high/medium/low value for each category in the ranking process. Priority is ranked from 1 (low in priority) to 3 (high in priority); conversely, cost is ranked from 1 (high cost) to 3 (low cost). This method of ranking assures that high priority and low cost projects receive the highest rating. It was mentioned to project evaluators that the matrix was to be used as indicating relative values among proposals. Final scores are not to be interpreted as absolutes, and ranking differences of one or two points were likely to be insignificant. In order to avoid a false sense of quantitative valuation, all categories were weighted equally.

Summary of Results from Project Prioritization Process

Generally, public and firefighter safety was first and foremost of importance. Those projects that provided immediate and effective protection to residents and firefighters as well as public and private property ranked highest. These included fuel breaks, fuels reduction projects, and other fuel manipulation projects that would reduce the severity and spread of wildfire events. Second in ranking were projects that aided in the control of wildfire, including firefighting infrastructure improvements such as water tank installations and water delivery infrastructure development. Finally, those projects that were long term and less immediate in nature, such as organizational improvements, planning projects, and the development of community input, were included on the list of proposed projects.

Categories Used by Participants to Rank Recommended Projects

Community (areas valued by community members): High value examples are a community, a housing development or a grouping of several residences, a telecommunications translator, a community water supply, or key travel corridors. Low value examples are areas containing no residences or infrastructure issues.

Public Safety: An asterisk (*) was added to highlight urgent projects.

Fuel Hazard (areas with high fuel loading and/or flammable vegetation): High hazard equates to dense, flammable vegetation (e.g., thickets of second growth, untreated plantations, or brush fields). Low hazard equates to open ground, areas previously thinned, or areas containing no ladder fuels.

Fire Risk (areas with a high likelihood of fire starting): High risk equates to areas with high slope position and southwest aspect, with a past history of lightening strikes, or with high concentrations of human activity (e.g., hunting camps). Low risk equates to areas with low slope position, with little human activity, or with little past history of lightening strikes or fires.

Ecological Value (a measure of known ecological concerns in the landscape): High value is assigned for known habitat of threatened, endangered species or species for which USFS survey and manage protocols apply (e.g., notable stands of old growth vegetation or known nesting habitats of rare species. Low value did not indicate lack of ecological value but rather no outstanding concerns for the particular area in question.

Economic Value (a measure of known economic value of area resources): High value is assigned for areas with private property values, power lines and/or plantations or other investments/resources at risk. Low Value is assigned for areas containing no particular infrastructure or resource value.

Readiness (ability of landowners and managers to respond quickly): High value is assigned where the ability exists for both private landowners and the USFS to act immediately with community support on public or private land. Low value is assigned where significant administrative work would be needed (e.g., NEPA compliance) before activities could take place.

Cost of Project (referring to overall economic cost of doing the work): High cost examples include inaccessible or steep terrain, or a large scale project. Low cost examples include clearing defensible space around a residence, or some types of controlled burns.

Recreation Value / Viewshed: High value would be a scenic highway designation or high recreational use area. Low value would indicate that no particular value was noted.

Land Allocation: USFS land allocations were included in the matrix to give a quick view of likely treatment opportunities and constraints on public lands (e.g., Late Succession Reserve, Adaptive Management Area, Wilderness, or Matrix).

V. FIRE PLAN AREA AND PLANNING UNIT DESCRIPTIONS

Location: Geographic and Environmental Conditions

The Tehama East CWPP project area includes the those portions of the Battle Creek, Inks Creek, Paynes Creek, Seven-Mile Creek, Salt Creek, Antelope Creek, Dye Creek, Mill Creek, Toomes Creek, Deer Creek, and Pine Creek watersheds located between Ponderosa Way to the east, and the Sacramento River to the west *(Figure V-1.)*. Tributaries to these streams have also been included in the planning analysis. These watersheds are located in the center of the CALFED Sacramento Valley Regional area. Sub watershed units analyzed in this fire planning document are shown on Figure 1 at the end of this section. The project area covers approximately 863 square miles. Elevations in the area range from approximately 270 feet along the Sacramento River to almost 4,000 feet along portions of Ponderosa Way. A list of USGS 7.5 Minute Quadrangles that cover the project area are shown in the table below.

USGS 7.5 Minute Quadrangles Contained in the Tehama East CWPP

Acorn Hollow	Dewitt Peak	Manton
Balls Ferry	Digger Pine Flat	Panther Spring
Barkley Mountain	Finley Butte	Red Bluff East
Bend	Foster Island	Richardson Springs NW
Campbell Mound	Gerber	Shingletown
Cohasset	Inskip Hill	Tuscan Buttes NE
Dales	Los Molinos	Tuscan Springs
Devils Parade Ground	Lyonsville	Vina

The Tehama East Community Wildfire Protection Plan study area generally includes those portions of eastern Tehama County containing chaparral, oak woodland, and grassland landscapes. A portion of the study area includes lands immediately adjacent to the Sacramento River. These low elevation streamside landscapes were included in the fire planning process because a number of land management organizations, including the U.S. Fish & Wildlife Service, California Department of Fish and Game, and The Nature Conservancy, are involved in fire management activities within the riparian habitats along the river channel. Forested areas of eastern Tehama County were generally excluded from the project area because these lands are largely managed by the United States Forest Service, Sierra Pacific Industries, and Collins Pine Company and are already covered by relatively detailed fire and fuels management plans and project work now in progress. Portions of the interface area between the planning area's upper elevation chaparral lands and low elevation pine/mixed conifer

forests were included in the planning process in order to more completely address fire and fuels issues within the main portion of the fire plan's project area. Those areas included in the fire planning process have received relatively limited fire planning or are immediately adjacent to developed areas and are also of critical importance to both fire response organizations, landowners, or land management organizations.

In order to identify small scale issues and problems as well as to develop detailed strategies and specific projects to address these concerns, the Tehama East CWPP project area was divided into an array of planning units based upon natural conditions, demographics, firefighting resources, and land management organization boundaries and agenda *(Figure V-2.)* . Factors involved in this delineation were:

- Watershed boundaries;
- Fire behavior variables including fuels, topography, access, water supply, assets at risk, and fire history;
- Urban development including formally classified at-risk communities, WUI areas, unclassified areas of development, known utilities routes, and fire protection features such as water supply infrastructure and large fuel breaks; and
- Sources of ignition including population centers and transportation routes.

CAL FIRE's 2005 Tehama–Glenn Unit Fire Plan identifies equipment use, vehicles, power lines, and campfires as major ignition sources throughout eastern Tehama County. Consequently, the location of various area and linear features that represent potential sources of ignition were considered in the creation of planning units. These features were found to be useful in analyzing fire threats and in developing corrective measures to protect local assets from potential wildfire. Among the types of features considered were urban area boundaries as well as roads and highways, power lines, pipelines and other linear features.

The use of watershed boundaries as the primary delineator of planning units was based upon the behavior of wildfire in relation to topography and vegetation as well as the impact that large, intense wildfires can have on watershed health, watershed functioning, water quality, and the resulting safety and well being of communities. CalFire also recognizes the environmental realities that impact wildfire through their development of fire management planning zones that incorporate multiple firefighting agency jurisdictions in recognition of the fact that wildfire often crosses administrative boundaries. As a result, adequate fire protection and prevention measures have been developed based upon a landscape perspective as well as the organizational interrelationships between fire and land management entities.

The Tehama East CWPP project area was divided into four planning areas as described below:

Sacramento River Corridor Planning Unit (61 square miles). This planning unit encompasses the land near the eastern bank of the Sacramento River and includes Woodson Bridge, Los Molinos, Dairyville, Bend, and portions of Red Bluff. The western boundary of this planning unit follows the Sacramento River, and the eastern boundary generally follows a line one mile east of the river. The northern boundary of the Battle Creek watershed forms the northern boundary of this planning unit. The southern edge includes the north side of the Pine Creek watershed.

North: Battle Creek watershed northern boundary
East: One mile from the Sacramento River stream course
South: Pine Creek watershed northern boundary
West: Sacramento River

Battle Creek–Manton Planning Unit (173 square miles). This planning unit includes the community of Manton and its surrounding urban interface area. It also includes portions of the Battle Creek watershed that lie inside or adjacent to the Tehama County line, the Inks Creek watershed in its entirety, and those portions of the Paynes Creek watershed that lie to the north of Highway 36. Throughout much of its length in Tehama County, Ponderosa Way generally demarcates low elevation forested landscapes from the county's chaparral and oak woodlands. As a result, this significant eastside rural road forms the eastern boundary of Manton/Battle Creek planning unit as well as the entire Tehama East CWPP project area. Highway 36 forms the southern boundary of this planning unit, as this road feature generally follows the dividing line between the Battle Creek and Paynes Creek watersheds. The Manton/Battle Creek planning unit shares its western edge with the Sacramento River Corridor planning unit.

North: Battle Creek watershed's northern boundary
East: Ponderosa Way
South: Highway 36
West: One mile from Sacramento River

Paynes Creek–Highway 36 Corridor Planning Unit (190 square miles). This planning unit contains a number of urban interface areas including the communities of Dales, Paynes Creek, Ponderosa Sky Ranch, Lyonsville,

Panther Spring, and Lyman Springs. Major portions of the Paynes Creek and Antelope Creek watersheds as well as portions of the watersheds of Salt Creek and Seven Mile Creek, are included in this unit. The northern edge of the unit follows Highway 36, which divides the Battle Creek and Paynes Creek watersheds. Ponderosa Way forms most of the eastern boundary. The southern edge of the Paynes Creek–Highway 36 Corridor Planning Unit generally follows the watershed boundary of the main stem of Antelope Creek's south fork. The unit shares its western edge with the Sacramento River Corridor planning unit.

North: Highway 36
East: Ponderosa Way, including Judd Creek watershed
South: Antelope Creek watershed, plus Judd Creek watershed
West: One mile from Sacramento River

Central–Cohasset Planning Unit (437 square miles). The town of Vina and the urban interface areas of Cohasset and Campbellville are included in this planning unit. Much of the area is unpopulated, very remote, and managed largely for grazing, wildlife production, rare plant and animal species, and watershed health and productivity. The watersheds of Deer Creek and Mill Creek are within the boundaries of this planning unit; however, these watersheds are generally excluded from current analysis as both areas already have fire plans in place. The Mill Creek and Deer Creek fire plan documents are incorporated into the Tehama East Community Wildfire Protection Plan document either directly or by reference. The majority of the watersheds of Pine, Rock, Dye, and Toomes Creeks are included in the Central Cohasset Planning Unit. The northern edge of the planning unit runs generally along the southern watershed boundary of the south fork and then the main stem of Antelope Creek. Ponderosa Way forms the eastern boundary. The southern boundary of the unit follows the ridgeline above the urban influence area of Cohasset, incorporating portions of the upper Rock Creek watershed and following the southern boundary of the Pine Creek watershed toward the Sacramento River. As a result, a small portion of the fire plan project area lies within north central Butte County. This planning unit shares its western edge with the Sacramento River Corridor Planning Unit.

North: Antelope Creek
East: Ponderosa Way

South: Cohasset urban influence area, upper Rock Creek watershed, Pine Creek watershed (excluding lowest reaches)
West: One mile from Sacramento River

A base map of the project area showing the planning units described above is contained on Figure 2 at the end of this section. Also included on that map are inhabited areas at risk from wildland fire, including:

Dales	Manton
Paynes Creek	Ponderosa Sky Ranch
Cohasset	Lyonsville
Red Bluff	Lyman Springs
Tehama	Los Molinos
Vina	

Environmental Setting Overview

The Tehama East CWPP project area is located within the southernmost extension of the Cascade Range. The Pliocene Age mudflows that make up the Tuscan Formation dominate the area's geology as it dips and thins towards the southwest. Within the fire plan area's lowest elevations located along the valley floor, quaternary sediments of the Sacramento Valley formation can be found. Soils generated from these parent materials are generally productive, with erosion rates ranging from low to moderate on andesitic soils, to high to very high on the rhyolitic soils. Mass wasting is evident in the area's watersheds, dominated by debris flows in colluvium filled hillsides. Failures are episodic and normally triggered by extreme precipitation events. Surface erosion on steep slopes is the other major source of sediment. Steep slopes adjacent to the main channels have traditionally prevented extensive development. During more recent times, conservation easements and other land use decisions have also reduced the potential for intensive human activities within this portion of eastern Tehama County.

The range of elevations found within the fire plan area result in significant variation in precipitation rates, which range from 25 inches on the valley floor and the Sacramento River to nearly 60 inches in the vicinity of Ponderosa Way. As a result, the area's vegetation forms a continuum from grasslands at the valley floor to oak woodlands and chaparral on the easternmost two-thirds of the fire plan area. A small portion of the project area is within the lower range of the pine and mixed conifer forests. Peak flows from the watersheds are dominated by rain within the majority of the project's planning area and by snow events at upper elevations to the east. The

combination of varied geology and vegetation help to support a diverse array of wildlife habitats in the watersheds. These include foothill, old growth, and riparian groups and twenty-five CalVeg habitat types. The species supported by these habitats have regional significance, including numerous species which have disappeared elsewhere. Included are peregrine falcons, bald eagles, California spotted owls, and willow flycatchers.

Traditionally, forests and rangelands within the area's watersheds have supported local and regional economies. About half of the forest lands within the larger project area are under private ownership and at the present time logging output from the eastside continues at a much lower rate. Cattle production on eastside rangelands has also been significantly reduced, but ranching still provides beef and limited employment to the economic base of Tehama County. Recreation activities in the watersheds have steadily increased over the past few decades, attributable to an increase in the region's population as well as the current mobility of the American recreating public. Lassen National Park is located just east of the Battle Creek–Manton Planning Unit, and U.S. Forest Service campgrounds are sites of concentrated use. Highway 32 provides easy access to stretches of Deer Creek, a major site of recreational fishing.

Aquatic resources in the watersheds have regional significance. Paynes Creek and Antelope Creek are considered by numerous agency personnel to have the potential of being improved into more significant habitat for anadromous species, while Battle Creek, Mill Creek, and Deer Creek are already considered significant anadromous species streams. Although there are diversion structures in the valley sections of all three of these creeks, there are no major impoundments. Anadromous fish (spring and fall run chinook and steelhead) have been able to maintain passage, and native fish communities have survived in the free flowing sections. A fish ladder constructed by the California Department of Fish and Game in the 1930's to provide passage over Lower Deer Creek Falls has extended the historic anadromous fish habitat by about five miles. Herpetile species, which have declined precipitously throughout the state, are found in a number of eastside watersheds, including Cascade and foothill yellow-legged frogs. The anadromous fish habitats along Battle Creek are probably the best remaining habitat above the Central Valley for these species and the creek serves as an important anchor for their recovery.

Demographics

At the present time, the Tehama East CWPP project area remains largely rural in nature. The fire plan area skirts the eastern border of Red Bluff and includes the communities of Dairyville, Los Molinos, and Vina located near the east bank of the

Sacramento River. Communities in the project area's higher elevations include Manton, Paynes Creek, Ponderosa Sky Ranch, Dales, Lyonsville, Panther Spring, Lyman Springs, and Cohasset (which is located just over Tehama County's southern boundary in Butte County).

Land Use and Development Trends

Development and land use within eastern Tehama County are currently in a period of flux. Traditionally, land use in the eastside area consisted of ranching, private timber production, watershed management, mining, and very low density rural residential development. In addition, the Federal Reserve Act of 1891 created the National Forest system to preserve timberlands and other areas in the public domain and to prevent them from passing out of public possession. A significant portion of the lands in eastern Tehama County are managed by a number of federal and state land management agencies for an array of resource and environmental considerations.

At the present time, the eastside area is experiencing more intensive urban development in the form of small ranches, ranchettes, and rural communities. In addition, the eastern urban fringe of the county's larger communities such as Red Bluff, Manton, and Bend continue to expand their interface area into what once were farming and grazing areas. Topographic features, vegetative fuels, and severe weather potential raise the threat of wildfire impacts on structures within these areas. Preventative measures are available, and some are in place to aid firefighters in the suppression of structural fires occurring in wildland areas. Significant among these are roofing, defensible space, and fire prevention.

VI. FIRE RISK ENVIRONMENT

Fire Behavior: A Combination of Weather, Topography, and Fuels

The three major components of the wildland fire environment are weather, topography, and fuels. Local weather conditions such as wind direction, wind speed, precipitation and humidity are important in predicting how a fire will behave. Within the lower elevations of the Tehama East Fire Plan project area, winds blow from the north during the early part of summer and from the south during the latter part of the summer season. Within Tehama County's eastern foothills, winds tend to blow up the canyons and along hillsides during early morning hours and downslope in the late afternoon and evening. In the valley, wind patterns push wildfire in a northerly or southerly direction, while in foothill areas winds trend in a westerly direction. The average wind speed in the eastside area has been determined to be between approximately 1.1 to 4.8 miles per hour. During the fire season (June to October), daily temperatures within the project area are usually in excess of 90° Fahrenheit, and relative humidity is typically less than 30 percent. The majority of the area's precipitation occurs between October and April.

Topography can affect the direction and rate of fire spread. Topographic factors important to fire behavior are elevation, aspect, steepness, and shape of slopes. When fire crews are considering fire suppression methods, topography is always critical in determining the safest and most effective plan of attack. When accessible, ridge lines are very important features from which to conduct fire suppression activities and can be a strategic area to conduct fuels management activities.

Of the three components affecting fire threat, fuel is the only factor that can be controlled. Fuel characteristics that influence fire behavior are fuel moisture, loading, size, compactness, horizontal or vertical continuity, and chemical content. Fuel moisture is the amount of water in vegetative fuel and is expressed as a percentage of its oven dry weight. Fuel loading is defined as the oven dry weight of fuels in a given area, usually expressed in bone dry tons, or 2,000 pounds of vegetation when rated at zero percent moisture content. Fuel size refers to the dimension of fuels, and compactness refers to the spacing between fuel particles. Continuity is defined as the proximity of fuels to each other, vertically or horizontally which governs a fire's capability to sustain itself. Chemical content in fuels such as oils or other flammable compounds can either retard or increase the rate of combustion. All of these factors

will influence the amount of heat delivered and the duration, flame length, and rate of spread of a particular fire and will be considered prior to developing fire prevention projects or initiating fire suppression activities.

One of the primary goals developed for this fire plan project is to identify areas of high fuel loading. CalFire has developed a Fuel Rank assessment methodology to prioritize pre-fire projects that reduce the potential for large catastrophic fires. The fuel ranking methodology assigns ranks based on expected fire behavior for unique combinations of topography and vegetative fuels under a given severe weather condition (wind speed, humidity, and temperature). The procedure makes an initial assessment of fuel rank based upon an assigned fuel model and slope. Fuels have been classified into four groups – grasses, low foothill shrubs, moderate density shrubs such as those found in chaparral regions, and hardwood forest stands containing litter, slash, and understory vegetation. This fuel ranking also incorporates the amount of ladder and/or crown fuel present to arrive at a final fuel rank. CalFire pre-fire engineers verify these rankings and use this fuel rank assessment in conjunction with assessments for weather, assets at risk, and level of service in order to develop the fuel ranking system shown below.

Fuel Rank	
Rank	Description
1	Moderate
2	High
3	Very High

This fuel ranking system was used along with anecdotal information provided by stakeholders in identifying high fire hazard areas and their relationship to project area assets at risk. These sources of information pertaining to high fire hazard areas were also used in developing suggested future fire and fuels management projects to either protect specific at risk assets or to increase the effectiveness and efficiency of those protective features that are already in place.

Tehama County's Fire Shaped Ecosystems

Fire has been an integral force within many Northern California ecosystems since the Pleistocene. From the mixed conifer forests of the Coast Range, to the chaparral and grasslands of the county's inland foothills, fire is in some instances the dominant factor controlling ecological change within many local landscapes. In

addition to renewing vegetation and recycling nutrients from live and dead plant material in the form of ash, the numerous low intensity burns of the past are suspected to have been a major factor in the environmental determination of plant structure and distribution as well as the composition of vegetative communities. Natural fire regimes are also suspected to be a catalyst for the reorganization of vegetation during periods of dramatic climate change.

Grassland, oak woodland, and chaparral landscapes are found in abundance within Tehama County's eastern foothills and uplands and are among the county's largest fire dependent ecosystems. Within an elevation belt ranging between 500 to 5,000 feet, fire has historically swept through the vast stands of sclerophyll chaparral vegetation, on roughly a 20 to 30 year basis, removing old, decadent plant material with low vegetative and forage production. The county's grasslands and oak woodlands experience the impacts of wildfire on an even more frequent basis. As a result of wildfire impacts, these chaparral ecosystems are frequently returned to an earlier stage of seral development. Repeated fires reduce the competition of dominant brush species which can, if not controlled, develop into single species stands that can attain heights of ten feet or more. Many chaparral species are particularly well adapted to fire, having developed an ability to produce root sprouts after burning. Fire improves brush stands as forage for large mammals by replacing woody, unpalatable vegetation of low nutrient value with new, more palatable root sprouts having somewhat higher nutritional value. The newly opened crowns of these brush fields allow more sunlight to reach the soil, resulting in the production of grasses, forbs, and those plants that develop from fire germinated seeds. Surface water is more readily available through a reduction of plant transpiration. In addition, the removal of dominant brush species by fire or other means often results in more complex plant communities. Among the varieties of brush species that develop in the eastside area's fire based ecosystem after a wildfire event are Toyon, Deer Brush, Red Bud, Common Manzanita, and Chaparral Whitethorn.

The pine and mixed conifer forests found in the county's Cascade mountains are another example of ecosystems that have been shaped largely by fire. Tree ring studies and charcoal analysis indicate that fires passed through many of these stands every six to 32 years. Prior to the early 20th century, the frequency of these low intensity blazes provided a mechanism for thinning of the forest's understory, which prevented the development of extensive forested areas containing dense, slow growing, even-aged stands that often result after high intensity wildfires. Instead, early accounts of Northern California forests describe a patchwork of dense thickets containing trees and brush as well as more open, park-like stands. Low impact fires also provided a suitable

bed for pine seeds that normally do not germinate successfully in heavy forest litter. Without fire, species such as White fir, Douglas fir, and incense cedar crowd out less competitive, shade intolerant, young pines even in their primary habitat range at lower elevations, changing the vegetative composition of these forests. In addition, without continuous low intensity fires that clear forest stands, rapidly growing brush species compete with seedlings of timber species, reducing their rate of survival. Overcrowding also tends to weaken large pines, making them susceptible to insect attack. Reduction of forest fuels prevents the development of more intense fires that can damage and kill seedlings and young trees, greatly reducing the amount of regeneration in the understory. A reduction of young understory vegetation also removes developing ladder fuels through which ground fires can move into forest crowns. Once this occurs, wildfires can spread quickly and become much more intense.

Grasses, forbs, and perennial and annual herbs dominate the grassland communities of the county's eastside area. Within these ecosystems, plant density and air temperatures are normally high enough to carry regularly occurring, fast moving, low intensity fires, which have become a major factor of change within this biotic community. A major impact of wildfire in grassland ecosystems is its affect on the distribution and form of individual plants, as well as the composition of the entire vegetative community. Grassland fires also impact the population and distribution of birds, rodents, insects, and ungulates that inhabit these environments. As with other fire-based ecosystems, the exclusion of naturally occurring wildfire within grasslands can have significant and often negative impacts on these landscapes. Intense, widespread wildfires can significantly reduce naturally occurring mulch and can reduce the depth of humus in the organic layer of grassland soils, resulting in a reduction of grasses and forbs species.

Disruption in the naturally occurring cycle of fire within grasslands can also lead to an increase in the occurrence of tree and shrub species, particularly in those grasslands immediately adjacent to woodlands and open forests. A single blaze passing through an interface area between these two plant communities can stimulate germination of seeds from brush species that require heat to initiate growth response. Once this occurs, the removal of grassy material prepares an appropriate bed for newly germinated seeds. Subsequent suppression of wildfire then allows these woody species to take full advantage of moisture and nutrients while the grass and forbs species redevelop into a competitive plant community. Finally, non-native invasive species and noxious weeds that are ill adapted to frequent fires have an opportunity to become established, increase in numbers, and spread throughout an ecosystem, threatening plant diversity and forage values. These invasives can also adversely impact native

vegetative communities by altering patterns of nutrient recycling, hydrologic processes, and the intensity of fire.

Many of the species considered to be invasive within eastern Tehama County are annuals that are entirely dependent upon seed production for yearly propagation. In addition, a large number of these plants remain green and produce viable seed long after native perennial species have matured and cured. As a result, frequent fires have the opportunity to kill invasives prior to seed germination, thus reducing seed counts and the potential for future development. Invasive plant pests are defined by law, regulation, and technical organizations. Weed control methods include physical control (e.g., burning and hand pulling), chemical control (e.g., selective or non-selective herbicides), and biological control (e.g., insects that eat the pest). The use of fire to control invasives, particularly starthistle and medusahead, has been utilized throughout the fire plan area to varying degrees of success.

Human-Wildland Interactions Within Tehama East CWPP Project Area

The development of communities adjacent to and within the state's wildlands have experienced dramatic growth that has taken a number of forms. In addition to the simple expansion of the urban fringe, rural subdivisions located far from urban centers, as well as homes and small ranches built on individual parcels, have developed from lot splits which create residential densities that approach those of urban areas. These scattered areas of development are often created without many of the infrastructure components and fire safety features that are integral to fire protection. Significant among these deficiencies are access to two lane roads for escape and ingress of fire fighting equipment, water supply systems with the capacity to provide adequate fire protection, and parks and other large areas of cleared space between developed lots, as are often found within and at the perimeter of urban subdivisions. Mobile homes are often used as residences on these small parcels and create additional structural fire hazards. This type of residence is more susceptible to flash fire and is relatively easy to install without adequate vegetation removal.

Within eastern Tehama County, the conversion of wild areas into urban and residential uses is currently taking place largely within the county's oak and conifer woodlands. In terms of wildfire threat, these areas of rural development have been described as a point where the fuel feeding a wildfire changes from natural (wildland) to man made fuel such as structures, crops and urban debris. This intermingling of wildland and manmade fuel, often referred to as the "wildland-urban interface/intermix," has made the control of wildland fires more difficult and costly. It has also dramatically increased the danger and potential destruction caused by wildfire.

During a large wildfire event, widely scattered development requires firefighting forces to disperse in order to protect numerous isolated structures. As a result, manpower and other resources necessary to initiate attack on a fire front cannot be organized thus allowing wildfires to spread and build in intensity much more rapidly. In addition, this dispersal of urban development makes rescue and evacuation efforts during such emergencies more difficult, dangerous, and time consuming. Of equal importance is that scattered urban development patterns make the efficient use of prescribed burning on a landscape scale more expensive and risky. Smoke from prescribed burns can damage homes and burn escapes near more densely populated landscapes can destroy residential developments, thus increasing the cost of liability claims made against land management entities involved in fuels reduction projects.

History of Fire and Fuels Management in Eastern Tehama County

With the creation of the United States Forest Service in the early 20th century and the California Department of Forestry and Fire Protection (Cal Fire) in 1905, a federal and state infrastructure was created to prevent and suppress all wildfires within eastern Tehama County. As of 1905, statewide efforts had established full suppression of wildfires throughout Tehama County and the rest of the North State. Fire suppression success was defined in terms of an overall decline in the number and size of wildfires. At the same time, it was becoming apparent that when wildfires did occur, they were often more intense, resulting in large areas of severe vegetation destruction. The increase in fire occurrence and intensity was becoming particularly acute in forested areas, where large expanses containing substantial amounts of debris, brush, and dense thickets of small timber had developed as result of logging and other resource extraction activities. The occurrence and intensity of wildfire was also found to be increasing in open wildlands where naturally occurring fires were being extinguished without exception in order to protect manmade resources and to maintain vegetative cover in watersheds.

Decade	Fire Events	Acres
1900	1	948
1920s	7	59,518
1930s	12	61,254
1940s	32	59,914
1950s	18	13,234
1960s	12	5,758
1970s	8	103,188
1980	11	12,023
1990	17	12,892
2000	14	10,484
Total	132	339,213

Source: CALFIRE Fire Resource and Assessment Program

Overview of Tehama County Fire Protection Organizations

Firefighting responsibilities in Tehama County are divided into a number of organizational units whose responsibilities are described below. Those firefighting units dealing primarily with fires within eastern Tehama County's wildlands and wildland/urban interface areas are listed in the table below:

Summary of Fire Facilities within Eastern Tehama County

Department	Station Name	Address	City
CALFIRE/TCFC	Station 1	604 Antelope Blvd.	Red Bluff
CALFIRE/TCFC	Station 5	22310 Bend Ferry Road	Bend
CALFIRE/TCFC	Station 10	7930 Sherwood Blvd	Los Molinos
CALFIRE/TCFC	Station 16	4560 Rowles Road	Vina
CALFIRE/TCFC	Station 18	31291 Manton Rd	Manton
CALFIRE/TCFC	Station 20	37900 Hwy 36E	Mineral
CALFIRE/TCFC	Station 21	29960 Plum Creek Rd	Paynes Creek
CALFIRE/TCFC	Paynes Creek	29105 Hwy 36E	Paynes Creek
CALFIRE	Vina Helitack Base	4520 Highway 99E	Vina
USFS	Mineral	38965 Highway 36E	Mineral
USFS	Mineral	38050 Highway 36E	Mineral

City of Red Bluff Fire Department

Primary responsibility of this department is for the City of Red Bluff and rural areas immediately adjacent to city limits. The Department operates one fire station.

Tehama County Fire Department

Primary responsibility is for Tehama County's Local Response Area. The fire department operates six fire stations within the Tehama East CWPP project area.

CalFire

CalFire is responsible for controlling wildland fires on 283,778 acres of State Responsibility Area (SRA) lands throughout Tehama County and has fiscal responsibility over an additional 10,767 acres of SRA lands which are directly protected by the U.S. Forest Service. California Public Resources Code 4125 establishes that local and

federal agencies have primary responsibility for fire prevention and suppression in all county areas not classified as SRA. Every five years, CalFire reissues maps identifying the boundaries of the SRA with any modifications approved by the Board of Forestry. In addition to the stations within the county that CalFire operates or for which CalFire is responsible, other firefighting resources are available in neighboring counties, including aerial attack bases.

Historic catastrophic losses of structures in the WUI have resulted in an array of laws and regulations to protect the public. On a yearly basis, each Battalion of the Tehama-Glenn Unit performs LE38 inspections of clearance around structures (Public Resource Code 4291) in order to aid residents in understanding and complying with the regulations that affect the impact of wildfire events. Tehama County Ordinance 1537 includes Chapter 9.14, known as the "Tehama County Fire Safe Regulations," that went into effect after October 1, 1991. The Fire Safe Regulations constitute the basic wildland fire protection standards of the California Board of Forestry. These regulations have been prepared and adopted for the purpose of establishing minimum wildfire protection standards in conjunction with building construction and development in Tehama County. Items identified include basic road access, signing and building numbering, private water supply reserves for emergency fire use, and vegetation modification. Fire department personnel attend stakeholder meetings in order to aid the public with information and possible resources to utilize for fuel management projects in high priority/fire hazard areas.

The Tehama County Fire Prevention and Education Officer (TCFPEO) plays a key role in the placement and construction of building projects. During plot plan and project plan review, building site placement is considered. Design recommendations and special mitigation requirements are established for structures that do not have adequate vegetation clearance. The TCFPEO works cooperatively with the Tehama County Sheriff's Office and the Office of Emergency Services to develop documents for public reference in the form of Fire Prevention Calendars and Multi-Hazard Emergency Evacuation Plans. The calendars prompt homeowners about upcoming fire season conditions and provide information on how to prepare homes and property for a wildfire event. The Multi-Hazard Emergency Evacuation Plan for the communities of Tehama County provides a detailed checklist for conducting pre-incident preparation and lists the proper procedures to follow during an emergency. These plans were developed by the TCFPEO to address the critical needs of fire department and law enforcement personnel during emergencies such as wildland fires, hazardous material leaks, floods, natural disasters, and homeland security emergencies. In addition, the Tehama County Fire Prevention and Education Officer was involved in drafting the fire

chapter of the county's Disaster Mitigation Act of 2000 (DMA 2000) Multi-Hazard Plan and continues to provide input into the document's impact on fire related issues. The DMA 2000 Plan is required by the Federal Emergency Management Agency in order for local agencies to apply for pre-disaster mitigation funds.

CalFire/California Department of Corrections Ishi Conservation Camp

The CalFire and the California Department of Corrections operate this minimum security facility jointly. The camp provides inmate fire crews that can be dispatched throughout the county and the entire state. At the present time, the camp has an array of wildland firefighting, service, and transportation equipment.

United States Forest Service

The Lassen National Forest manages a significant portion of those lands within the Tehama East CWPP planning area and beyond its easternmost boundary (Ponderosa Way). The primary responsibility of this agency is for the control and suppression of wildland fires (not structural fires) on federal land. While there are no U.S. Forest Service fire facilities within the project area, a seasonal facility is located in the community of Mineral a few miles east of Ponderosa Way. U.S. Forest Service crews and equipment are also available at stations located within the Lassen National Forest boundary in Plumas, Lassen, and Shasta Counties. In addition, the agency has access to substantial firefighting personnel and equipment throughout the region utilizing operating agreements established between the National Forests.

Lassen Volcanic National Park

Although beyond the boundary of the Tehama East CWPP planning area, the Lassen Volcanic National Park headquarters maintains a seasonal fire station manned by 22 seasonal and two permanent firefighting personnel. Suppression equipment at the station includes one Type 6 engine and one patrol unit. Through a mutual response agreement with the Lassen National Forest and CAL FIRE, these firefighting resources could be made available for fire incidents within the Tehama East fire planning area.

Bureau of Land Management

The United States Department of Interior's Bureau of Land Management (BLM) oversees the management and operation the Ishi Fire Management Unit located within eastern Tehama County. At the present time, either the U.S. Forest Service or CalFire conduct all fire suppression operations on these lands. In the event of a wildfire, BLM fire management and fuels personnel would serve as duty officers and agency representatives to

an interagency team. In addition, several local BLM staff members have Red Cards, which allow them to join fire suppression forces if needed.

The Nature Conservancy
Dye Creek Preserve

The Nature Conservancy (TNC) provides the Dye Creek Preserve with an active fire management program. As a result, the organization maintains significant fire and fuels management infrastructure. In addition to TNC personnel trained in wildland fire fighting and prescribed burning techniques, Dye Creek Preserve has a fire station and small tanker available for use during wildfire events on TNC-owned or managed lands, as well as when conducting fuels management operations.

Interagency Approach to Firefighting In Tehama County

Wildland fires ignore civil boundaries. Consequently, it is necessary for cities, counties, special districts, and state and federal agencies to work together in order to minimize the adverse impacts of wildfires. All Tehama County firefighting organizations are coordinated through automatic mutual aid agreements and can assist one another as needed. This interagency array of firefighting forces is dispatched by the Tehama-Glenn Emergency Command Center (TGECC) in Red Bluff according to a Standard Response Plan (SRP). The TGECC will dispatch fire engines, other emergency equipment, and personnel from the closest resources available to fill the requirements of the SRP, regardless of jurisdiction.

Through early detection, fire lookouts play a crucial role in preventing small fires from becoming large catastrophic wildfires. During the 2004 fire season, two lookouts were operational within the vicinity of the Tehama East CWPP project area and were manned by either U.S. Forest Service or CalFire personnel. These lookout facilities are listed below:

Lookout Facilities Servicing the Tehama East Fire Plan Area

Lookout Name	Managing Agency	Location
Inskip Butte	CAL FIRE	Tehama County
Digger Butte	U.S. Forest Service	Tehama County

Community ISO Rating

As a means to standardize the rating of communities in terms of their ability to protect homes and other structures from fire, the ISO (Insurance Service Office)

system was developed by the firefighting and fire insurance communities. The ISO system rates the following fire protection criteria:

- Fire protection level of service or lack of service in terms of proximity to paid fire fighting personnel,
- Level and quality of emergency communications systems, and
- Quality and capacity of community emergency water delivery systems.

The "10 point" rating system (with 1 being the best and 10 being the worst) is often used by insurers in order to determine the availability and rate of fire insurance policies. The table below lists the current ISO ratings of the major communities within the Tehama East CWPP project area:

ISO Ratings for Major Communities within the Tehama East CWPP Project Area

Community	ISO Rating	Rationale for Rating
Red Bluff	3	
Manton	10	No community fire protection water system/volunteer fire department
Paynes Creek	10	No community fire protection water system/volunteer fire department
Ponderosa Sky Ranch	10	No community fire protection water system/volunteer fire department
Bend	Not Rated	No community fire protection water system/volunteer fire department
Cohasset	Not Rated	No community fire protection water system/volunteer fire department
Lyonsville	Not Rated	No community fire protection water system/volunteer fire department
Lyman Springs	Not Rated	No community fire protection water system/volunteer fire department
Panther Spring	Not Rated	No community fire protection water system/volunteer fire department

Community Infrastructure within the Tehama East CWPP Project Area

Roads

Roads are an essential part of fire safety, fire management, and fuels reduction planning. These linear features provide access to communities, homes, and wildlands,

as well as escape routes in the event of wildfire or other disasters. In addition, roads of all types provide a defensible space from which firefighters can conduct direct attack on wildfires and provide a strategic location for roadside fuel breaks. For the purposes of this plan, significant roads within the Tehama East CWPP project area have been classified into two groups: primary roads such as freeways, state highways, and county arterial roads and secondary roads such as local routes, major and minor collector routes, and local roads. These significant routes are listed in the adjacent table.

Major Roads and Highways within the Tehama East CWPP Project Area

Road Name	Road Type
Interstate 5	Interstate Freeway
State Route 99E	State Highway
State Route 36E	State Highway
State Route 32E	State Highway
Cohasset Road	Local
Forward Road	Local
Hazen Road	Local
Manton Road	Major collector
Ponderosa Way	Local
Lanes Valley Road	Minor collector
Hogsback Road	Local
Plum Valley Road	Local
High Trestle Road	Minor Collector
Balls Ferry Road	Local
Spring Branch Road	Local
Wildcat Road	Local
Foothill Road	Local

In addition to developed roads, the eastside area contains many minor roads and primitive jeep trails that access public and private forest and ranch lands. However, many of these are unmapped, gated, and/or locked and therefore do not provide reliable ingress or egress. This network of transportation routes could provide a framework for emergency evacuation routes and a system of linear fuel breaks that would protect large areas of wildlands and would link scattered fuel reduction projects located throughout the eastside area. Unfortunately, these same roads also provide an extensive area along which sources of ignition can create fire starts. The road network of eastern Tehama County often passes through areas containing hazardous fuels, creating a significant threat of ignition. Consequently, special attention must be paid to these high hazard areas in terms of reducing fuels.

Ponderosa Way

Ponderosa Way was constructed in the 1930s along the western front of the Sierra Nevada and Cascade ranges. The route acts as an access road and fuel break between the chaparral lands and the lower elevation Ponderosa pine forests. The road acts as the eastern boundary of the Tehama East Community Wildfire Protection Plan project area and thus transverses the three easternmost planning units. The majority of lands along that portion of the route within the planning areas are managed by the U.S. Forest Service and Sierra Pacific Industries, and over the decades public and private projects have been conducted along Ponderosa Way in order to maintain its viability both as a transportation route and as fire control infrastructure.

Various efforts along Ponderosa Way by an array of entities have been planned, are underway, or have been completed that address specific fire and fuels management issues within the individual planning units. Details of these efforts will be discussed within each planning unit portion of the Tehama East CWPP. Overall, however, greater use of this significant feature as a fuel break infrastructure needs to be coordinated between land management entities and other stakeholders in order to develop landscape scale protection. In addition, financing of these initiatives will need to be shared between public and private beneficiaries. It is recommended that a workgroup be established consisting of Lassen National Forest and Sierra Pacific Industries personnel, county Fire Safe Councils, and local community groups in order to strategize countywide project planning and implementation along Ponderosa Way. The goal of these efforts would be to develop a coordinated, regional set of projects along Ponderosa Way that would provide maximum protection to the landscapes, communities, and resources of eastern Tehama County.

Business and Commercial Development

The economy of eastern Tehama County is based largely upon cattle grazing and other forms of animal husbandry such as breeding, feedlot operations, and hobby ranches. Several specialized agricultural operations are in the area as well. Fire in the area's grasslands and oak woodlands have the potential to damage or destroy these facilities if fire response and fuels management efforts are ineffective.

Cultural Resources

Various communities found within the Tehama East CWPP area contain an array of cultural resources that are shared by local residents. Among these are community buildings, infrastructure, and parks. In addition, eastern Tehama County contains both historic and prehistoric cultural resources that could be impacted, damaged, or destroyed by wildfire or fire management activities if effective protection and mitigation measures are not implemented.

Air Quality

During the county's fire season in late spring, summer, and fall, smoke dispersing winds are often absent, and an inversion layer above the Sacramento Valley is present much of the time. As a result, the often large volumes of smoke generated in connection with wildfires within the county's lower elevations can be trapped and can drift toward developed areas containing an array of sensitive sites such as hospitals, schools, rest homes, and other facilities. Impacts caused by drifting smoke are soiling of property, public nuisance, visibility loss, and related traffic safety issues. In order to reduce the impact of wildfire on air quality, it is critically important to reduce the threat of uncontrolled fires through a combination of fire safety, fire management, and reduction of hazardous fuels in a manner which allows the controlled release of smoke emissions.

U.S. Fish & Wildlife Service Critical Habitat

Vernal Pool and Listed Species. Within all four of the Tehama East CWPP planning units are areas containing vernal pool habitat which have been classified as USFWS critical habitat for vernal pool listed and endangered species such as Vernal Pool Tadpole Shrimp, Fairy Shrimp, and Hairy Orcutt grass. Although these landscapes have developed under regimes of frequent fire, these sensitive ecosystems can be negatively impacted by excessive high intensity wildfire at critical times of the year. At the present time, The Nature Conservancy and other land management entities are attempting to understand and

recreate natural rates and intensities of fire within these vernal pool areas in an attempt to sustain and improve these habitats.

Utility Infrastructure

Numerous power lines, gas lines, and water conveyance infrastructure features are found throughout the Tehama East CWPP project area. When constructed, a considerable amount of vegetation was removed within the utility right of way that continues to be maintained in order to reduce the potential of these features to pose a fire threat. A number of these facilities traverse more than one planning unit; as such, they could be developed into regional fire protection infrastructure. Significant among these are a PG&E twin steel tower line and a Central Valley Authority single tower line which span multiple planning units. A number of smaller power lines and gas transmission lines are also found within the planning area. These large and small manmade features can, with some additional work, be developed into site specific linear fire breaks or ingress routes for firefighting forces. Detailed project recommendations have been developed for those portions of utility infrastructure found within each planning unit and described in the "Results, Summaries and Recommendations" portion of the Tehama East CWPP document.

Lassen Foothills Range Management

The Lassen Foothills Range Management Project encompasses three Tehama East CWPP planning units including the Battle Creek–Manton Planning Unit, Paynes Creek–Highway 36 Corridor Planning Unit, and Central–Cohasset Planning Unit. The project integrates prescribed fire use with wildfire response to manage grasslands, chaparral, and oak woodlands in an ecologically sustainable manner. The project is led by a coalition that includes The Nature Conservancy, ranchers, and resource agencies operating in eastern Tehama County. This TNC-initiated effort was selected for inclusion in the Fire Learning Network, a national workgroup created to facilitate collaborative landscape scale fire management projects and other efforts. At the present time, project work entails weed-control burns conducted between May and June with occasional small experimental burns conducted in the fall. Normally, existing roads and wet lines are utilized to contain fire spread. Minor lengths of hand or dozer lines are needed on occasion, where existing barriers are inadequate or where fire engine access is poor. Mechanically constructed fire lines are normally constructed on previous fire lines or where primitive roads have already been developed. In 2005, approximately 3,000 acres were burned. If maintained, these linear fire control features could be used as narrow permanent fire breaks to reduce the opportunity of

naturally occurring wildfires or prescribed burns from gaining intensity and creating unwanted impacts on these important landscapes.

VII. Area Wide Planning Efforts Recommended by the Tehama East Community Wildfire Protection Plan

In order to implement the fire protection, fire management, and fuels reduction goals established for the Tehama East Community Wildfire Protection Plan, a number of projects have been developed through the collaboration of area stakeholders, the project's workgroup, the plan's Technical Advisory Committee, and the Tehama County Resource Conservation District. Some of these projects have been initially proposed for funding or are in the early stages of design. Others are in process or completed but can still be expanded, redesigned, or continued in order to improve the fire safety, fire management, and fuels situation within eastern Tehama County. Some projects are small scale and cover the entire planning area; some are site specific and address localized fire issues. Regardless of spatial extent, the following objectives have directed the design and implementation of project work:

- Projects provide a method to assess the potential for linking with other fire and fuels management efforts in order to maximize the efficiency and cost effectiveness of project work.
- The project selection process gives the highest priority to those projects which provide maximum linkage and continuity with other wildfire related efforts, thus assuring greater positive impacts on fire conditions within eastern Tehama County.
- A mechanism is provided in all fuels modification projects to assure that project work is continually maintained and adequately conducted through self financing.
- Projects maximize the responsibility of individual landowners to protect their own properties from wildfire.

The projects proposed in this plan generally fall into three categories: fuels reduction/vegetation manipulation, infrastructure development/improvements, and organizational improvements. Fuels reduction and vegetation manipulation projects include efforts that attempt to impact the current arrangement and composition of vegetation and manmade fuels either at a single location or throughout an entire landscape. Infrastructure projects include construction and improvement of those manmade structures that provide fire safety and fire control. Projects in the organizational category include improvements in the structure and organization of those

entities that provide fire protection services, including organizational improvements in nongovernmental entities that develop, promote, and advocate change in the human environment that impacts fire related issues. This type of nongovernmental organization would include Fire Safe Councils, watershed groups, and other community advocacy organizations. The techniques often used to manipulate the volume and arrangement of vegetative fuels are discussed in the following paragraphs.

Shaded Fuel Breaks: This form of vegetative fuel modification involves the thinning of forest crowns as well as the reduction of surface and ladder fuels. Perhaps most importantly, however, this type of vegetative manipulation maintains sufficient crown cover to effectively shade out shrubs and other vegetation that grow in the forest understory.

Defensible Fuel Profile Zone (DFPZ): Defensible Fuel Profile Zones are strategically located linear fuels reduction treatments and fire protection areas that are generally constructed one-quarter mile wide along significant public and private roads as well as along strategic ridgetops. DFPZ's are also designed to traverse communities, watersheds, or other areas of special concern. Within the DFPZ, hazardous surface, ladder, and canopy fuels are mechanically treated to levels that are less overstocked and closer to historical stocking levels. These developed features allow firefighters to quickly, safely, and effectively attack and suppress oncoming wildfire. The linear nature of the DFPZ network allows the development of connectivity between fire protection and fuels reduction projects on adjoining properties throughout a watershed. As a result, more extensive and effective fire protection can be developed than can be achieved through the creation of numerous unconnected fire related projects. Among the benefits of a DFPZ are:

- Protects communities, forest resources, watersheds, and wildlife;
- Addresses excessive fuel loading and overstocked timber stands at an appropriate scale and pace;
- Provides opportunities for adjoining landowners to extend fuels reduction projects and thus increase the protective capabilities of project work;
- Provides known DFPZ locations that can be incorporated into fire protection plans at the county level; and
- Provides an effective means to reduce roadside fire ignitions.

Roadside Clearings: Roadside clearings generally follow paved roads that are important for emergency evacuation, firefighting access, and fuel break development. These clearings will vary in width and in the degree of vegetation clearing based upon

landowner cooperation, fuel density, and fire threat. Often, a 25 to 50 foot width is established from the road edge as a minimum objective for this type of project. The general prescription for a roadside clearing would be to remove all concentrations of brush and smaller trees (less than eight inches) away from the road edge. Larger trees are normally spaced to the maximum extent allowed by the property owner and pruned to at least ten feet from the soil surface.

Areawide Projects

In the process of developing the Tehama East Community Wildfire Protection Plan, a number of initiatives have been identified that are expected to positively impact wildfire conditions and fire ecology of the entire planning area. These recommended actions entail area wide projects conducted largely by federal, state, and local governments, as well as changes in county ordinances that impact building, land development, and other activities. Recommended landscape scale projects are described below.

CalFire Tehama-Glenn Unit Fire Management Plan

The CalFire Tehama -Glenn Unit Fire Management Plan is a cooperative effort between state and local stakeholders focused on fire and fuels management within Tehama and Glenn Counties. The Tehama-Glenn Unit's pre-fire engineer is responsible for updating the multi-county plan through the incorporation of current fire policies at the state level and identification of new and in-process project work which will impact fire hazards within the planning area. Local stakeholders include Tehama-Glenn Fire Safe Council members, who provide input into the State's fire planning process by submitting project ideas and information on the progress of in-process project work. Council members also assist in prioritizing projects among a competing array of fuels management efforts. The Tehama County Resource Conservation District has been closely involved in the development of the unit fire plan by assisting CalFire staff in gathering project information, preparing the related Tehama East and Tehama West Community Wildfire Protection Plans, and by providing a coordinator for the Tehama-Glenn Fire Safe Council.

The overall goal of the Tehama-Glenn Unit planning process is to identify public and private assets at risk from wildfire throughout the CalFire area of responsibility within Tehama County. The plan utilizes a methodology for defining assets protected and their degree of risk from wildfire. The assets at risk addressed in the plan are life safety (citizen and firefighter), watersheds and water quality, timber, wildlife and wildlife habitat (including rare and endangered species), rural communities, unique

areas (scenic, cultural, and historic), recreation, range, property in the form of structures, and air quality. The planning document identifies strategic areas for pre-fire planning and fuels treatment, preparation of fuels evaluations and for validation of data provided from historical and current fire information and weather factors. The plan also develops an array of measures to protect at risk assets, including a combination of fuel modification, ignition management and fire-wise planning.

Predevelopment planning is another significant component of the overall planning process and includes changes to local building codes and zoning ordinances, creation of educational and public information programs, and recommendations for improvement of firefighting infrastructure such as new or improved fire stations and water systems. The pre-fire management prescriptions identified in the Tehama-Glenn Unit plan also identify those who will benefit from such work and, consequently, those who should share in the project costs. With this information and a prioritized list of projects, stakeholders can more successfully apply for funding or approval of project work containing solutions that have been developed by consensus in a collaborative environment. As a result of these cooperative efforts among stakeholders, fire and fuels management projects can be conducted on a landscape basis with a greater chance of success. Finally these state fire planning efforts and the creation of both the Tehama West and Tehama East Community Wildfire Protection Plans are expected to support the land use and safety elements of the Tehama County general plan by incorporating appropriate portions of the California Fire Plan so that each county's fire plan supports the state plan.

CalFire Vegetation Management Program

The Vegetation Management Program (VMP) is an ongoing cost-sharing initiative between private landowners and CAL FIRE, which takes the role of project administrator. The program focuses on the use of prescribed burns and mechanical fuels reduction in order to reduce fire-prone vegetation on State Responsibility Area (SRA) lands. Traditionally, project work completed under this program takes the form of shaded fuel break development, roadside clearings, and prescribed burns for gross wildland fuels reduction. CalFire has responsibility for 283,778 acres of SRA in Tehama County and fiscal responsibility for an additional 10,767 acres which is directly protected by the U.S. Forest Service. The VMP allows private landowners to enter into a contract with CalFire to use prescribed fire and other means to accomplish a combination of fire protection and resource management goals; implementation of VMP projects is by local CalFire units. The fuels reduction projects that will be completed first are those that are identified through the CalFire's fire planning process

and those developed and prioritized in individual Community Wildfire Protection Plans (i.e., Tehama East CWPP, Tehama West CWPP, and Community of Manton CWPP).

Ponderosa Way Fuels Reduction Plan/Strategy And Coordination of Ponderosa Way Road Maintenance and Vegetation Management Projects

The road surface and adjoining vegetation of Ponderosa Way are maintained by various public and private entities, including the Tehama County Roads Department, Lassen National Forest, Bureau of Land Management, Sierra Pacific Industries, and Collins Pine Company. Many useful fuels reduction projects have been developed and executed along this important north-south route through the county's eastside chaparral lands. However, better organized efforts would enhance the development of an overall fuels reduction plan and implementation strategy for Ponderosa Way, and more widespread, effective, and cost efficient work could be leveraged between individual projects.

At a minimum, this work entails annual grading and partial rocking of road segments as well as the removal of hazard trees. Along a number of road segments, management by the U.S. Forest Service and Sierra Pacific Industries has included reduction and thinning of brush in order to create shaded fuel breaks and linear control features for prescribed burns. Ponderosa Way represents a significant access and escape route in the event of wildfire. It also creates a relatively effective fuel break for fires moving upslope from the west or downslope from the east. Considering the importance of this road to wildfire safety, as well as to fire and fuels management efforts, it is recommended that an overall management plan be developed for that portion of Ponderosa Way within Tehama County. A primary concern of such a planning effort would be an inventory and assessment of road surface conditions between Highway 44, Highway 36E, and Highway 32E. In determining the road conditions between major east-west highways, federal, state, and local fire authorities would be made aware of problem areas along Ponderosa Way that would slow rapid and efficient egress from the eastside area during a large wildfire event. Through the identification of fuel conditions along this route, public and private land managers can identify opportunities for collaborative fuels treatments along and adjacent to the roadway, thus increasing the potential for effective and cost efficient project work.

Grading and Maintenance of Ponderosa Way

Ponderosa Way is a major north-south access route through three of the four planning units of the Tehama East Community Wildfire Protection Plan. The entire length of this route is unpaved and in need of grading; there are numerous stream crossings that are highly eroded in certain places. The current condition of the route is a hindrance to local firefighting agencies responding to fires and other emergencies throughout these areas. Although the Tehama County Public Works Department is responsible for maintenance of Ponderosa Way, sustained funding for the upkeep of this important access route has not been secured at an adequate level. It is recommended that the Tehama County Road Department collaborate with firefighting agencies and owners of private timber lands in order to develop permanent sources of funding for the maintenance of Ponderosa Way.

Mapping of Harvest and Thinning Projects on Public and Private Timber Lands

Under the provisions of the California Forest Practices Act, individuals and companies who conduct timber harvesting or thinning projects are required to submit Timber Harvest Plans in connection with commercial operations. Other less stringent permits are required for homeowners or other small forestland owners who conduct fuel treatments to prevent or reduce the impact of wildland fire. These permits require the preparation of planning maps which show the location of harvest and treatment units as well as the intensity of stand reduction. This spatial information would be invaluable to firefighting agencies attempting to forecast fire behavior during suppression activities, thus improving fire suppression and post-fire resource protection strategies. It would also be helpful to forest managers in developing future vegetation manipulation projects that leverage previous treatment work in order to maximize the value and cost effectiveness of current fuels projects. Such an initiative would not require additional work on project applicants, only an additional copy of the project information. It is recommended that CalFire or some other resource management entity gather timber harvest information and develop a database and map of timber harvest areas and/or thinning projects.

Fire Hazard Reduction Coordination with Tehama County Public Works Department

Public road and highway agencies are responsible for maintaining rights-of-way in a safe condition. This responsibility includes fuels reduction along roads in areas with increased wildfire risk. Properly maintained roads can act as effective and cost

efficient fuel breaks over large areas. It is recommended that the road maintenance unit of the Tehama County Public Works Department be advised whenever fire hazard reduction projects are conducted within the vicinity of County maintained roads. Through collaboration with responsible agencies, project work can be linearly linked over large distances using rural roads and as a result, increased fire protection benefits can accrue to area stakeholders.

Map of "Fire Protection Existing Benefit Rating Criteria" For Roads within the Almanor District of the Lassen National Forest

In the winter of 1999, the Almanor District of the Lassen National Forest initiated its Roads Analysis Process (RAP) for the Deer, Mill, and Antelope Creek watersheds. In June 2001, the District released the document "Roads Analysis within Deer, Mill and Antelope Creek Watersheds." One component of the analysis was the development of a "Fire Protection Existing Benefit Rating Criteria." This rating system was used to identify the various benefits provided by different road segments in the forest's westside front range and timberland areas. The analysis defined the following classification of benefits to fire protection:

0 = Unknown	Benefit of road for fuels management or fire suppression activities is unknown. More information is needed.
1 = Little to No Benefit	Road is located in drainage bottom. Low or no prior fire history. Poor location for a DFPZ.
2 = Low benefit to fire suppression or fuels management	Road is located on lower slopes on north or east aspects. Fire history reflects few fires or mainly low intensity fires. Poor location for DFPZ.
3 = Moderate benefit	Road is located on lower slope with south or west aspect or on mid-slope with north or east aspects. Fire history shows a higher frequency of fire occurrence or moderate to high intensity fires. There are benefits to DFPZ locations. Road provides access to a large area.
4 = High Benefit	Road is located mid-slope with south or west aspects or on ridgetops. Fire history shows high fire occurrence or high intensity fires. Good location for DFPZ. Road provides exclusive access to a large area.
5 = Highest Benefit	Same as 4, plus road is currently along existing or proposed DFPZ. Fuel loading is moderate to high. DFPZ maintenance is required. The road is used to access structures (property) or there are structures in the area.

Once the classification of road segments within the Almanor District has been completed, highly rated roads could be recommended for fuels reduction projects such as shaded fuel breaks. Such roads would have significant physical characteristics that would directly benefit the effectiveness of fire control infrastructure. Future fire control and fuels management efforts would thus become much more cost effective.

Fire Hazard Reduction Coordination with PG&E

PG&E is required by law to maintain certain clearances on rights-of-way for its primary and secondary power transmission lines. It is recommended that future fire hazard reduction projects be coordinated with PG&E as a way to share costs and to enhance project work.

Fuel Hazard Reduction Coordination with the Central Valley Project

The Central Valley Project maintains a high voltage power line that traverses the Battle Creek–Manton, Paynes Creek–Highway 36 Corridor, and Central–Cohasset planning units. As is the case with the PG&E facilities described above, the Bureau of Reclamation is required to maintain the vegetation along the power line right of way.

Fuel Hazard Reduction Coordination with AT&T

Within the Battle Creek–Manton, Paynes Creek–Highway 36, and Central–Cohasset planning units, AT&T maintains an underground telephone cable. During installation of the line, vegetation was removed, and portions of the utility company right-of-way remain clear of fuels. The cable runs from the northeast and trends to the southwest. In addition, a considerable portion of cable line is located on flat to moderate slopes. If vegetation was managed along the entire length of the cable right-of-way, this linear feature could provide access for firefighters and their equipment, as well as providing the basis for a more extensive fuel break within a significant portion of the three planning units. Consequently, a recommendation was developed for the collaborative development of a fuel break between AT&T, the Tehama-Glenn Fire Safe Council, Tehama County Resource Conservation District, United States Forest Service, and local landowners.

Fuel Break Maintenance and the Wildfire Assessment District (WAD)

Vegetation fuel hazard reduction work requires a continuing maintenance program once projects have been completed. New brush often grows quickly from

sprouts or seed if not controlled. Herbicides, prescribed burning, mastication, and grazing are some of the methods that can be used for control. It is very important that a maintenance program begin within the first two to three years after the initial project is completed in order to control the flush of regrowth that is stimulated by the disturbances of the original project. The maintenance program would then need to be repeated on a routine basis. It is recommended that follow-up maintenance projects be initiated in a timely manner after the completion of each fuel hazard reduction project. With public funding for such maintenance projects in short supply, the Tehama-Glenn Fire Safe Council should work with the Tehama County Resource Conservation District and the Tehama County Board of Supervisors in pursuing county property tax assessments in those communities that are protected using publicly funded fuels management projects.

One method of community assessment that directly links property owner funding with specific fire and fuels management project work is the creation of a wildfire assessment district (WAD). This form of California special district is created with the overall goal of systematically managing vegetative fuels in order to significantly reduce the risk of future wildfires. The WAD accomplishes its goal through programs and services such as vegetation inspection, roadside treatment, private contract work, chipping programs, green debris removal, livestock grazing for fuels reduction, public outreach, and roving fire patrols. These assessment districts are funded by an annual parcel tax on properties within the district boundary. Each year, property owners are assessed a set amount on their property tax bill by a county tax assessor or other taxing authority. Developed land is normally assessed on a per parcel basis, with unimproved and undeveloped land being assessed on a per acre basis. Tax revenues generated through assessments are used exclusively for fire and fuels management projects, or other uses as specified in the district charter. Assessments are also used to repay startup expenses, such as assessing the need for a special district or funding a special election for landowners within the district's service area. These districts often have vegetation management inspectors and a planning coordinator who addresses public outreach. Oversight usually takes the form of a citizen's advisory committee that develops a mission statement, sets long term goals, and recommends strategic policies and programs to support its mission.

In order to create a special district, Article XIII-D of the California Constitution requires the approval of an ordinance and resolution by a county governing body such as a Board of Supervisors. The ordinance would establish the procedure for creation of the district, specify the kinds of programs and services that could be provided, and provide for operation of the district, including methodology and rate of assessment.

Development of Sufficient Water Storage, Handling, and Delivery Systems throughout Eastern Tehama County

Portions of eastern Tehama County contain rural communities that lack water storage, handling, and delivery capacity sufficient to fight wildfires. As a result, rural homes can be put at risk if wildfire disrupts electrical service and water cannot be generated on site. Several communities in the Tehama East CWPP project area currently have either no water capacity or insufficient capacity for their population and, consequently, must depend on either tanker supplied water or water drafted from surface sources during wildfire events. Ten thousand gallon tanks are recommended in communities that have a single urban core where the majority of homes and other structures are located. Five thousand gallon tanks are recommended in dispersed communities covering large areas. In a wildfire situation, it is equally important to have adequate supplies of water and to have supplies that are readily available from various locations throughout the community.

Collaborative efforts between the Tehama-Glenn Fire Safe Council, CAL FIRE, Tehama County Resource Conservation District, Tehama County Planning Department, local citizens, and community groups should be encouraged in order to explore options available to increase water storage capacity and delivery systems for fire-fighting purposes. This group of stakeholders should also pursue grant funding to finance these improvements. In addition, consideration should be given to increasing the water flow and storage capacity requirements found in the county's zoning regulations.

Review of Tehama County Building, Land Development, and Zoning Codes

In order to reduce structural ignitability, the Tehama County building and land development codes should be reviewed in order to determine if all current building and land development standards incorporate fire safe standards. Recommended changes would include updated regulations and standards for new construction, as well as building retrofits in order to make them less prone to loss from a wildfire attributable to embers, radiated heat, or surface fire spread. Specific suggestions for code changes are discussed below.

Incorporate Fire Safe Principles into County Land Use and Zoning Ordinances

The Tehama County Planning Department should consider reviewing its land use and zoning ordinances in order to assure that these codes adequately, efficiently,

and effectively promote fire safety and structure survival in the event of catastrophic wildfire. Among zoning issues that can impact the safety of rural residents are:

- Rural residential zoning that takes into consideration the expected density and number of homes in addition to parcel size when requiring fire protection measures.
- Rural Residential zoning that takes into consideration natural fuel loadings and topographic features that can make a site more susceptible to wildfire threat—as an example, building sites on steep slopes in the chaparral belt of western Tehama County.
- Reassessment of workloads and response times of current fire facilities when analyzing requests for zone changes to higher density development.

Elimination of Wood Shake Roofs within the Portions of Tehama County Classified as a High Fire Threat

Efforts should be made to eliminate all wood shake roofs within the areas of Tehama County classified as having a high fire threat. Throughout the county, shake roofs have been identified as a significant cause of home loss in wildfires. Presently, homeowners in Tehama County are allowed to replace up to 50% of an existing roof per year as a repair. As a result, the use of wood shakes continues in both new construction and roof replacements. Research shows that homes with noncombustible roofs and clearance of at least 30-60 feet have a 95% chance of survival in a wildfire. In order to promote this effort, the Tehama-Glenn Fire Safe Council should work with the Tehama County Building Department to educate residents about the importance of replacing shake roofs. In addition, county officials should consider the following changes in building regulations and polices:

- Establishment of a reduced or no-fee permit for the replacement of shake roofs,
- Required replacement of shake roofs upon sale of a home, and
- Financial assistance programs for wood shake roof replacement among qualifying low income homeowners and first time home buyers.

County Incentives for Fire Safe Landscaping

In addition to constructing homes and other structures that are capable of surviving catastrophic wildfire events, the Tehama County Building Department should review building and development codes in order to assure that all landscaping

requirements are fire safe. Consideration should also be given to exploring an array of incentives to induce homeowners and other rural property owners to utilize fire safe landscaping techniques and plant materials. Finally, through cooperation between the Tehama County Building Department and CAL FIRE, consideration should be given to developing a program of uniform and consistent inspections in order to maintain homeowner compliance with Public Resources Code 4291, which establishes minimum standards for open space around structures.

Formal Classification of Eastside Communities as Federal at Risk Communities

The 10-Year Comprehensive Strategy Implementation Plan prepared jointly by the Secretaries of Agriculture and Interior in May of 2002 created a mandate that the United States Department of Agriculture and the Department of Interior work with state Governors on a long term strategy to deal with the wildland fire and fuels situation and the urgent need for habitat restoration and rehabilitation after wildfire. To this end, attention was focused on areas adjacent to federal lands that were within the wildland urban interface. More specifically, this partnership between the federal government and the states was tasked with the responsibility of creating "...broad, nationally compatible standards for identifying and prioritizing communities' at risk..." In identifying these communities, agency officials were to remain cognizant of three basic tenets:

- Include all lands and all ownerships.
- Use a collaborative process that is consistent with the complexity of land ownership patterns, resource management issues, and the number of interested stakeholders.
- Set priorities through project evaluation, not by ranking communities.

An initial step in the classification process was the establishment of a formal definition for "Urban Wildland Interface Community." On January 4, 2001, the Federal Resister published an initial definition of interface areas in order to focus fire protection and fire reductions efforts on those communities within at risk areas. According to the official federal definition, Urban Wildland Interface communities are those lands where "...humans and their development meet or intermix with wildland fuel." Further, the federal definition establishes three categories of communities that meet this description, of which Categories 1 and 2 are of special importance to federal officials.

Category 1. Interface Community

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.

Category 2. Intermix Community

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.

Category 3. Occluded Community

The Occluded Community generally exists in a situation, often within a city, where structures abut an island of wildland fuels (e.g., park or open space). There is a clear line of demarcation between structures and wildland fuels. The development density for an occluded community is usually similar to those found in the interface community, but the occluded area is usually less than 1,000 acres in size. Fire protection is normally provided by local government fire departments.

In addition to the spatial relationship between urban development and areas containing wildland fuels, a number of fire behavior and urban development criteria were converted to factors that needed to be considered when making a determination that a community was at risk of wildfire threat. The January 4, 2001 Federal Register described these significant factors through example by describing situations of decreasing severity on their impact to landscapes.

Risk Factor 1: Fire Behavior Potential

Situation 1: In these communities, continuous fuels are in close proximity to structures. The composition of surrounding fuels is conducive to crown fires or high intensity surface fires. There are steep slopes, predominantly south aspects, dense fuels, heavy duff, prevailing wind exposure and/or ladder fuels that reduce firefighting effectiveness. There is a history of large fires and/or high fire occurrence.

Situation 2: In these communities, there are moderate slopes, broken moderate fuels, and some ladder fuels. The composition of surrounding fuels is conducive to torching and spotting. These conditions may lead to moderate firefighting effectiveness. There is a history of some large fires and/or moderate fire occurrence.

Situation 3: In these communities, grass and/or sparse fuels surround structures. There is infrequent wind exposure, flat terrain with little slope and/ or predominantly a north aspect. There is no large fire history and/or low fire occurrence. Firefighting generally is highly effective.

Risk Factor 2: Values At Risk

Situation 1: This situation most closely represents a community in an urban interface setting. The setting contains a high density of homes, businesses, and other facilities that continue across the interface. There is a lack of defensible space where personnel can safely work to provide protection. The community watershed for municipal water is at high risk of being burned compared to other watersheds within that geographic region. There is a high potential for economic loss to the community and likely loss of housing units and/or businesses. There are unique cultural, historical or natural heritage values at risk.

Situation 2: This situation represents an intermix or occluded setting, with scattered areas of high-density homes, summer homes, youth camps, or camp grounds that are less than a mile apart. This situation would cover the presence of lands at risk that are described under State designations such as impaired watersheds, or scenic by-ways. There is a risk of erosion or flooding in the community if vegetation burns.

Risk Factor 3: Infrastructure

Situation 1: In these communities, there are narrow dead end roads, steep grades, one way in and/or out routes, and minimal firefighting capacity, no fire hydrants, no surface water, no pressure water systems, and no emergency operations group and no evacuation plan in an area surrounded by a fire-conducive landscape.

Situation 2: In these communities, there are limited access routes, moderate grades, limited water supply, and limited firefighting capability in an area surrounded by scattered fire-conducive landscape.

Situation 3: In these communities, there are multiple entrances and exits that are well equipped for fire trucks, wide loop roads, fire hydrants, open water sources (pools, creeks, and lakes), an active emergency operations group, and an evacuation plan in place in an area surrounded by a fireproof landscape. The Secretaries will work collaboratively with States, Tribes, local communities, and other interested parties to develop a ranking process to focus fuels reduction activities by identifying communities most at risk.

Since its initial publication, the federal list of at-risk communities has expanded to include all lands in the vicinity of wildland fuels, not just those adjacent to federally managed lands. As a result, the initial list of 843 communities increased to 1,283. In addition, the California State Forester has assigned the role of maintaining the current list of at-risk communities to the California Fire Alliance (CFA) which has recently developed a process whereby communities can be added or removed from the formal designation as an at-risk community. Given the significance that classification as an at-risk community has on project funding and prioritization, it is of critical importance that communities within the purview of the Tehama East Community Wildfire Protection Plan are assessed as to their potential for such classification.

Public Outreach and Fire Safe Education

The residents of Tehama County have already benefited from the public outreach and public information efforts of the Tehama–Glenn Fire Safe Council and its member organizations. These efforts have included fire safety and fire ecology articles published in local media and collaboration with Tehama County Resource Conserva-

tion District in conducting education workshops and distributing wildfire safety information at community meetings. In addition, council members have participated in Wildfire Awareness Week programs. With the exception of labor hours contributed by agency personnel and publicly funded watershed coordinators, these outreach and education projects have been accomplished at little or no public expense.

In order to increase public awareness of fire hazards and the need for continued fire management and fuels reduction project work, the local Fire Safe Council should further develop its program of public education and outreach. These increased efforts could be supported by the current outreach programs of the Tehama County Resource Conservation District, such as the following:

- Fire safe education workshops for developers, realtors, contractors, home builders, building inspectors, and citizens concerning prevention of wildfires, preparation for the inevitable occurrence of wildfire events, methods to ensure structural and landscaping survival following a wildfire, and the impacts of environmental features on the development of fire safe home sites.
- Public education advertisements that inform the public about new open space requirements, fire safe building materials, and the role of fire in maintaining fire safe landscapes within Tehama County in order to educate homeowners, ranchers and other residents about current changes in open space requirements.
- Report about new and ongoing efforts to manage wildfire and wildland fuels as well as the need for citizen input into the fire planning process.

Mapping of Secondary Ranch Roads and Development of Multi-Hazard Community Emergency Evacuation Plan

A number of ranch roads and other wildland routes are located throughout the Tehama East CWPP project area that could be used for both access to remote areas by firefighting personnel as well as for egress for area traffic during a significant wildfire event. Gates across these routes would require the installation of combination locks or keyed in a manner that would give firefighting personnel, land managers and local rural residents the ability to open them rapidly in the event of a fire emergency. Route maps would need to be developed and issued to firefighting personnel and others in order to expedite emergency response and escape.

Long Term Fire Education Programs

Several long term education program ideas were developed during the planning process that would provide continual low cost fire education services to Tehama County and northeastern California as a whole. Among these ideas was the development of a cost share agreement between the Tehama County Resource Conservation District (the fiscal agent of the Tehama-Glenn Fire Safe Council) and the Shasta County Fire Safe Council for the use and upkeep of their fire safety trailer. This portable education unit displays fire safe materials and facilitates fire education talks. The Tehama-Glenn Fire Safe Council and the Tehama County Resource Conservation District should explore cost sharing of this and other resources with the Shasta County Fire Safe Council, Western Shasta Resource Conservation District, the Cottonwood Creek Watershed Group, the Cottonwood Creek Fire Safe Council, the Battle Creek Watershed Conservancy, and the Manton Fire Safe Council in order to better leverage fire education grant funds.

Another idea for ongoing fire safety education was the development of a fire education facility to be located at the Tehama County Fairgrounds. The "Smokey Fire Safe Village" would provide displays of firefighting infrastructure as well as fire safe building materials, construction techniques, and landscaping practices. In addition, a number of model facilities have space within them for meetings, training sessions, and class presentations that would convey information about fire safety to students and adults. During development of the project's grant proposal, it was determined that this would be an extremely low cost tool for education of residents and visitors about fire safety, fire control, and fuels management. In early 2007, CalFire and the Tehama County Resource Conservation District prepared an application with the United States Department of Homeland Security for funding of the Fire Safe Village. This request was not selected for funding. It is recommended that the Tehama County Fire Safe Council, Tehama County Resource Conservation District, and CalFire continue to coordinate efforts to identify and obtain grant funding for the Fire Safe Village.

Support of Tehama County Fire Districts and Departments

It is recommended that the Tehama-Glenn Fire Safe Council and the Tehama County Resource Conservation District explore ways to assist the various Tehama County fire districts and departments in the area of grant funding for firefighting assets and training.

VIII. Overview of Assets at Risk and Currently In Place Fire Protection Infrastructure

Area Description and Overview
Battle Creek–Manton Planning Unit

The Battle Creek–Manton Planning Unit focuses on the watersheds of Battle Creek's North and South forks as well as the community of Manton **(Figure VIII-1)**. The two forks of Battle Creek drain an area of approximately 370 square miles. Within this portion of the watershed, both forks of Battle Creek along with its minor tributaries cascade through steep basalt canyons and foothills to the main stem's confluence with the Sacramento River near Cottonwood. Approximately 250 miles of Battle Creek are considered fish bearing, and 87 miles of the stream were historically accessible to anadromous fishes such as Chinook salmon and steelhead.

Major Land Management Areas and Assets at Risk

The Nature Conservancy Conservation Easements

Battle Creek is unique among Sacramento River tributaries due to its capability of supporting all four runs of Chinook salmon in the Sacramento River. Presently there are only two remaining suitable spawning habitats for winter run salmon: Battle Creek and the upper Sacramento River. Due to its unique hydrology, which includes significant year round cold water spring flows, Battle Creek is the only tributary in Tehama County that can consistently provide cold water at temperatures low enough to assure spawning success. In order to protect the critical habitat provided by both forks of Battle Creek, The Nature Conservancy has purchased or is currently negotiating a number of conservation easements within the watershed. These protected areas are expected to positively impact water quality and watershed conditions. The Nature Conservancy also owns the Wildcat Ranch on the North Fork of Battle Creek. In cooperation with CalFire, The Nature Conservancy developed Wildfire Response Plans for Wildcat Ranch and the conservation easement-encumbered Denny Ranch

Wildcat Ranch

The 1,844 acre Wildcat Ranch was purchased by The Nature Conservancy in 2001 and is located on the North Fork of Battle Creek. The property features pristine blue oak woodlands, springs, grasslands, chaparral, and high quality aquatic and

riparian habitat including approximately two miles of frontage on the North Fork of Battle Creek. The riparian habitat along this portion of the North Fork is relatively undisturbed. This property is located in an area of Battle Creek that has critical Winter-run and Spring-run Chinook salmon spawning and holding areas. The property includes a critical cold water spring that feeds this fork of Battle Creek. TNC's purchase of this property will help ensure that the springs will not be diverted for other purposes. Additionally, the property surrounds PG&E lands containing Wildcat Dam which is scheduled for removal as part of the Battle Creek Restoration Project. TNC will cooperate with various resources agencies regarding the dam's decommissioning and removal.

Denny Ranch

The 36,000 acre Denny Ranch is encumbered by a conservation easement held by The Nature Conservancy and is one of the largest in California. This property permanently preserves the natural habitats within a significant portion of the Lassen Foothills area east of Red Bluff while at the same time maintaining a private working cattle operation. Denny Ranch also supports thousands of acres of native grasses, oak woodlands, and vernal pools which provide habitat for native animals, raptors, song birds, and waterfowl. The vernal pools found on the ranch contain an array of sensitive, rare, and endangered species. Battle Creek and Antelope Creek, both of which flow through a portion of the easement area, have the potential to support four runs of Chinook salmon, steelhead trout, and other native fishes. In addition, increasingly rare blue oak woodlands are found in a significant portion of the Denny Ranch properties, as well as ribbons of riparian forests along creeks which provide critical habitat for native wildlife species such as yellow-legged frogs. Working in cooperation with The Nature Conservancy, Denny Ranch staff are working to control invasive weeds and increase the abundance and diversity of native plants through the use of carefully controlled prescribed fire. The use of fire to improve resource values within the easement has become a significant component of the Denny Ranch land management plan.

Dales Lake Ecological Reserve

The Dales Lake Ecological Reserve is a 366 acre vernal pool and wetland area managed by the California Department of Fish and Game for the purpose of research and public education. At the present time, studies are underway at the site in order to determine the impact of grazing on vernal pool ecosystems. In addition, restoration work is being conducted to restore vernal pool communities, native grasses, and forbs as the dominant vegetation on the site.

Bureau of Land Management Ishi Management Area

Within the Battle Creek–Manton Planning Unit, the Bureau of Land Management (BLM) oversees the natural resources on certain federally owned lands. As is the case on other BLM lands within the Fire Management Unit of the Ishi Wilderness Area, fuels management on these properties is limited to suppression activities and occasional prescribed fire and mechanical fuels treatments. The dispersed nature of BLM lands within this portion of the Tehama East CWPP project area makes management somewhat difficult and inefficient.

Communities

Manton and its Wildland Urban Interface Area

Manton is a dispersed community of approximately 350 residences located roughly 30 miles northeast of Red Bluff and is formally recognized as a federally listed at risk community. A considerable portion of the community's urban core was destroyed during the 2005 Manton Fire, which was spread by wind up Shingletown Ridge towards the Shingletown urban area. During that fire event, roughly 1,830 acres were burned, and 29 residences and other structures were destroyed. The original urban core contained several commercial establishments, a trailer park, post office, and community hall. Electrical and water utility infrastructure such as water pumping facilities and water supply ditches are located in the community's urban core and interface area. A number of these features were destroyed during the 2005 wildfire event. The community and the surrounding area are served by a seasonal CalFire Station along with a volunteer fire department.

Forward Valley and its Wildland Urban Interface

The Forward Valley area of the Battle Creek–Manton Planning Unit is located approximately six miles southeast of the Manton urban core. The area was once the site of a lumber mill and logging camp. A number of the original mill ponds remain, and various new recreational fishing ponds have been developed through the years. Much of the valley is now used for ranching, grape production, fish rearing, and recreation. Most of the forestlands surrounding the valley are managed in large holdings for timber production. There are currently about fifteen full time residents in the valley along with part time residents and recreational users. Forward Valley is separated from forested areas by Forward Road to the south and by Forward Mill Road and Rock Creek Road to the north. These mostly paved roads provide rapid access and

escape, and they also represent a significant fuel break between the local community and surrounding forestlands.

Roads

Manton Road (Tehama County A-6)

This major county road spans 25 miles connecting the community of Manton with State Route 36E at Dales. The road is paved and well maintained. A significant portion of the route is located within grasslands and scattered oak woodlands. In its present state, the road acts as an effective barrier between wildfires moving in an east-west direction. Closer to Manton, the road traverses chaparral lands and thick stands of oak woodlands. As a result the roadway is not as effective in containing large wildfires. Given the large volume of traffic along Manton Road, there is a significant risk of ignition.

Rock Creek Road

This Shasta County road intersects Manton Road from the north at the center of Manton. Just north of Manton, Rock Creek Road connects with Wilson Hill Road located on Shingletown Ridge and connects Manton with the Shingletown community and State Route 44. After its intersection with Wilson Hill Road, Rock Creek Road trends to the east through a growing community of rural ranchettes and homes. Approximately five miles east of Manton, Rock Creek Road intersects with Ponderosa Way.

Forward Road/Forward Mill Road

Forward Road is a paved east-west route on the south side of Forward Valley. The road intersects Ponderosa Way east of Manton and then turns into Forward Mill Road on the east side of Forward Valley. There, the road loops back to the west toward Manton on the valley's north side. Forward Road turns into Rock Creek Road just prior to intersecting with Ponderosa Way. All of Forward Road and all but three miles of Forward Mill Road is paved. The Tehama County Road Department is responsible for maintenance of both the paved and unpaved portions of roadway.

South Power House Road

This paved county road is the most westerly roadway in the larger Manton urban area. It connects Manton Road to the PG&E South Power House and penstock facilities along the South Fork of Battle Creek.

Hazen Road

On the south side of Manton, the paved Hazen Road runs east to west connecting South Powerhouse Road with Ponderosa Way. Due its location at the urban fringe, this road was used as the basis of a shaded fuel break project which was intended to protect the community from wildfires moving north. It also protects fires originating inside the urban area from impacting forestlands and the watershed of Battle Creek's South Fork.

Lanes Valley Road

Lanes Valley Road is a minor paved road that follows a general north-south route between Manton Road about ten miles west of the Manton to the point where State Route 36E passes the community of Paynes Creek. The road traverses very heavy chaparral fuel along most of its route. A large portion of this area was burned approximately 30 years ago in the Lanes Valley Fire. Lanes Valley Road provides access to a number of ranch facilities as well as the CalFire lookout tower on Inskip Butte.

Wildcat Road

This paved county road runs north from the Manton Road at its crossing with Battle Creek's South Fork and passes the Darrah Springs Fish Hatchery located in Shasta County.

Spring Branch Road

Spring Branch Road is a rough, undeveloped ranch road that connects Manton Road just past the Lanes Valley Road intersection with Jellys Ferry Road and the Sacramento River just south of Coleman Fish Hatchery Road.

Watersheds

Battle Creek

Battle Creek is unique among Sacramento River tributaries due to its capability of supporting all four runs of Chinook salmon. Currently there are only two remaining suitable spawning habitats for Winter-run salmon: Battle Creek and the upper Sacramento River. Battle Creek is the only habitat that can consistently provide the cold waters that Winter-run salmon need for spawning success. Due to the fact that Battle Creek is recognized as having the best potential for restoring all four runs of Chinook salmon as well as Steelhead trout populations, an agreement known as the

Battle Creek Salmon and Steelhead Restoration Project was signed by the California Department of Fish and Game, National Marine Fisheries Service, U.S. Bureau of Reclamation, and U.S. Fish & Wildlife Service (collectively, the "Resource Agencies") and PG&E to remove dams, restore in-stream flows, and install fish ladders and screens.

In addition to anadromous fish species, numerous stream dependent vertebrates, invertebrates, and plant species utilize the aquatic and riparian habitat provided by both forks of Battle Creek and its tributaries. Many of these species are known to be sensitive to changes in stream flow, water quality, water temperature, and sediment transport and deposition. The Valley Elderberry Longhorn Beetle is federally-listed species found in the Battle Creek watersheds. This beetle requires Valley elderberry bushes for larval and adult life cycles, and these are found largely within the riparian area.

Fire is an important natural process for sustaining the ecological health of watersheds in California. Several recent studies have established a link between fire and aquatic habitat. Inappropriate fire management, including indiscriminate fire suppression and lack of broad-scale use of prescribed fire, has altered the age and size structure of oak woodlands and foothill chaparral. Increased fuel loading resulting from fire suppression have led to catastrophic wildfires that have damaged and destroyed riparian and upland vegetation, resulting in subsequent impacts to water quality. CalFire records indicate that the primary causes of wildfire in the Battle Creek–Manton Planning Unit are lightning, human activities such as equipment use, vehicle exhaust, and debris burn escapes. A lack of prescribed fire has also allowed invasive species such as medusa-head grass to dramatically alter the composition of the grasslands matrix among oak woodlands and foothills chaparral on a significant spatial scale. Consequently, preservation of adjacent upland areas helps to maintain a more functional ecosystem that complements and enhances the riparian system.

In-stream development of infrastructure and wildfire both impact natural vegetative cover within the Battle Creek watershed. Sediment eroded and transported from denuded streambanks plays a significant role in determining the nature and quality of aquatic and riparian habitats. The development and stability of stream morphology and channel features used by fish depend on the rate at which sediment is routed through the channel and the composition of deposited materials. Local variations in topography, geology, vegetation, and hydrology determine the influence of sediment on the type, quality, and distribution of fish and riparian habitats within a given watershed. Natural rates of sediment delivered to streams can be significantly

affected by both land-use practices and wildfire if they alter the natural sediment transport processes.

Land use in the Battle Creek watershed ranges from relatively dense residential development in the Manton area to remote canyons and ranch lands. The development of dams and other hydroelectric power operations along with the construction of the Coleman National Fish Hatchery near the mouth of Battle Creek dramatically altered the abundance and distribution of Winter-run and Spring-run Chinook salmon and Steelhead populations in the Sacramento River system. Agency efforts to restore salmon and steelhead to the Sacramento River watershed have specified Battle Creek as a high priority tributary. Improvements to stream flows, migratory passage at diversion dams, and operations at Coleman Fish hatchery are considered to have the greatest chance of significantly improving fish migration and reproduction. In addition, stream channel conditions (e.g., gravel distribution and abundance, sedimentation, and channel morphology) within the main stem are considered to be suitable for salmon production.

Digger Creek

The two forks of Digger Creek provide a significant portion of the water, aquatic ecosystems, and riparian habitat to the overall Battle Creek watershed system. Flowing east from the Lassen National Forest, the north and south forks of the Digger Creek system meet just east of Forward Valley. The main stem then flows past the Manton Community just north of the urban core and joins the north fork of Battle Creek roughly one-quarter mile east of the Eagle Canyon Diversion Dam. For most of its length, Digger Creek is approximately ten to fifteen feet wide and less than one foot deep. The stream course has a moderately swift flow, a few pools, and a considerable amount of canopy consisting of willows, alder, blackberry, and grape.

Bailey Creek and Rock Creek

These minor tributaries to Battle Creek's north fork flow out of forestlands to the northeast. A portion of stream flows from both creeks are diverted to a small power house, and the remaining waters travel further west where they merge approximately one-quarter mile past the power facility, then joining the main stem of Battle Creek's north fork.

Darrah Springs Fish Hatchery

This California Department of Fish and Game trout hatchery facility is located along Wildcat Road within an area of grasslands and oak woodlands. Given the flat

terrain and the open oak woodland/grassland vegetation surrounding the facility, the threat of catastrophic wildfire is considered minimal.

Canals and Water Transfer Infrastructure

Boole Ditch

The Boole Ditch supplies water to a number of Manton area landowners along Forward Road southeast of the urban core.

Cross Country Canal

The Cross Country Canal is a major water transport system flowing through Manton's urban center. The canal transports water from the Volta Powerhouse north of Manton to its junction with the Union Canal and South Battle Creek Canal, a distance of about six miles. That portion of the canal located within the Manton urban area consists of a flume, while the remainder of the structure is a combination of open ditch and flume.

Union Canal

This water transport structure runs south approximately four miles from the Cross Country Canal to the South Powerhouse and the Inskip Dam along Battle Creek's South Fork.

South Battle Creek Canal

Roughly four miles southeast of Manton, the South Battle Creek Canal moves water northwest from the Soap Creek/Devils Canyon/Initial Gulch area, where it joins the Union Canal and Cross Country Canal south of Manton.

South Battle Creek Canal/South Inskip Canal/Coleman Canal (Inskip Dam and Coleman Dam Segment)

The South Inskip Canal is located just upslope from Battle Creek's South Fork and transports water east from Inskip Dam to the Coleman Dam where it joins the Coleman Canal and continues northeast to the Darrah Springs Fish Hatchery.

Digger Butte Lookout Restoration

The Digger Butte Lookout was constructed in 1936 and was once part of the California Department of Forestry's fire lookout system. At the present time the facility is in the process of being transferred to the Lassen National Forest for refurbishment

and operation during the fire season. It was recommended that Lassen National Forest expedite transfer of the facility to its organization in order to reestablish visual detection of wildfires in this portion of northeastern Tehama County.

Currently In Place Fire Protection Infrastructure

At the present time, an array of natural and manmade features are located within the Battle Creek–Manton Planning Unit which provide fire protection to local communities and other at risk assets or which prevent wildfires from building in intensity and developing into a catastrophic conflagration. These are described below.

Hazen Road Fuel Break Project

The Hazen Road Fuel Break Project is a multi-stakeholder initiative entailing the efforts of CAL FIRE, California Department of Corrections (CDC), Manton Fire Safe Council, Lassen National Forest, and Sierra Pacific Industries. Project work entailed clearing and thinning along a 100-foot wide and seven miles long portion of the county-maintained Hazen Road, along logging roads operated by Sierra Pacific Industries, and along wildland roads maintained by Lassen National Forest. Through the management of roadside vegetation, a shaded fuel break was created along both sides of this important local access and escape route. With the completion of fuel break improvements along Hazen Road, this significant component of local fire protection infrastructure now connects the Manton community to Ponderosa Way, effectively becoming an easterly alternate escape route for the Manton community and the surrounding area. Original funding for the project was provided by a grant from the Battle Creek Watershed Conservancy and CAL FIRE. Labor, equipment, and technical assistance were provided by the CDC, CAL FIRE, and Sierra Pacific Industries.

BLM Juniper Control in Blue Oak Stands

Reductions in fire frequency throughout blue oak stands in the Battle Creek–Manton Planning Unit have resulted in the invasion of California junipers. The Bureau of Land Management has initiated a program of cutting and burning juniper stands in an attempt to reestablish or improve oak woodlands. These efforts have also resulted in a reduction to area fuel loadings.

Battle Creek Defensible Fuel Profile Zone Project

The Hazen Road Fuel Break is part of the much larger Battle Creek Defensible Fuel Profile Zone Project which was a collaboration between the Battle Creek Watershed Conservancy, Sierra Pacific Industries, CAL FIRE, and the U.S. Forest

Service. Project work entailed development of a shaded fuel break and defensible fuel profile zone within the watershed of Battle Creek's south fork along public and private timberland roads. Project work extends from the end of the Hazen Road east to the community of Mineral approximately 20 miles away. In tandem with this effort, collaborators have initiated a program of fuels reduction projects using various techniques within the upper portions of Battle Creek watershed. These individual fuels reduction efforts are linked with one another utilizing the shaded fuel break. Additional fuel breaks on the north side of the watershed in the Shingletown ridge area are being developed in order to strengthen the defensible space used to prevent fires from moving into upslope timberlands to the north and east of Manton, providing protection to both the Shingletown and Manton communities.

Battle Creek Watershed Fuels Management Strategy

The Board of Directors of the Battle Creek Watershed Conservancy contracted with Lassen National Forest to develop a Fuels Management Strategy between Sierra Pacific Industries and the U.S. Forest Service on their respective lands within the Battle Creek watershed. The strategy includes a field verified fuel loading inventory, development of a shaded fuel break or defensible fuel profile zone plan, site specific treatments, and priority recommendations for all areas identified as having excessive fuel loadings. The BCWC Board continues to seek ongoing funding in order to maintain the Hazen Road fuel break and to implement the Fuels Management Strategy developed by Sierra Pacific Industries and Lassen National Forest. Through these planning efforts, the watershed conservancy hopes to implement an additional shaded fuel break on the north side of the Battle Creek watershed along Shingletown Ridge.

Priorities and Summary of Proposed Projects

The significant resources found within the Manton–Battle Creek Planning Unit consist of:

- The community of Manton, which is the only developed area in the Manton–Battle Creek Planning Unit having an urban core containing commercial services and community utilities infrastructure
- Lands used for commercial purposes such as grazing, vineyards, crop production, and timber production
- Vast watershed areas containing an array of important environmental values, including:
- The important anadromous species habitats provided by the north and south forks of Battle Creek

- Other sensitive, threatened, and endangered plant and animal species, along with their critical habitat
- Riparian habitats along watercourses
- Properly functioning aquatic ecosystems
- Unique landscapes such as The Nature Conservancy conservation easements
- The north and south forks of Battle Creek, portions of which are considered streams of nationwide significance and whose resources warrant inclusion into the Nationwide Rivers Inventory Listing maintained by the National Park Service
- Potential and current non-natal rearing habitat for juvenile Chinook salmon found at the mouth of Inks Creek
- Sites of cultural and historical significance, including ranches, home sites, and other areas of human occupation

Introduction

In prioritizing project recommendations, the protection of residents and firefighters was of primary importance. Additionally, protection of development on public and private property and in the Manton community's urban core was considered paramount. Also of considerable concern was the Battle Creek watershed, as both the north and south forks are considered critical to the protection and maintenance of the system's anadromous fish stocks, which are of statewide importance. As was the case throughout the project area of the Tehama East Community Wildfire Protection Plan, the protection of watershed plant and animal species and critical habitat were also given special consideration in the process of project development. Projects protecting cultural and historical resources were considered as well. The following descriptions and discussions of projects and their protection goals reflect the prioritization values of the planning area's stakeholders and project participants.

Development of Existing Roads as Fuel Breaks

The fire records and experience of Manton Volunteer Fire Department members indicate that the majority of wildfires impacting the Manton community occur during the months of August and September. Most of the ignitions related to these fires occur in dry grass and chaparral located at elevations between 1,800 and 2,400 feet. The normal wind direction in the Manton area is downhill in the morning and uphill in the afternoon, with stronger northerly or southerly winds occurring with the passage of high or low pressure systems. The behavior of past wildfires such as the very destructive Manton Fire of 2005 reveal that fuel breaks are most effective when there is light

wind and when fire is moving at right angles to the fire break. These fire control mechanisms are less effective on steep slopes due to increased flame lengths associated with the "chimney" effect. Throughout the Manton–Battle Creek Planning Unit, preexisting features such as roads, streams, PG&E canals, power line rights of way, and other utility infrastructure could be expanded quickly and efficiently into fire breaks. Using these observations, members of the Manton Volunteer Fire Department, the Manton Fire Safe Council, and the Battle Creek Watershed Conservancy have developed recommendations for various fuel breaks to be constructed in a north/south direction along relatively flat roads. Proposals for specific sites include the vegetation management program in Tehama and Shasta Counties and roadside thinning along Ponderosa Way.

Ponderosa Way

A majority of community members participating in the Manton Fire Safe Council agree that roadside thinning along Ponderosa Way should be top priority in developing fire protection infrastructure in this area for several reasons. This major thoroughfare ties into areas that have existing fuel breaks and other types of fuels reduction projects. Ponderosa Way makes a useful anchor point for new projects due to the considerable break in vegetation created during its construction. Because the roadway is located at the transition zone between chaparral/oak woodland and timber lands, some portions of roadside thinning along Ponderosa Way would require little, if any, short term maintenance. *(Refer to Figure VIII-1 at the end of this section.)*

Hazen Road Fuel Break

When originally completed, the Hazen Road fuel break provided considerable protection to homes and other structures located along its route. Several years have passed since the original project work was completed, and brush species are rapidly invading the initial treatment sites. It is recommended that the Manton Fire Safe Council, Tehama–Glenn Fire Safe Council, and Tehama County Resource Conservation District cooperate with the Tehama County Road Department in developing a collaborative funding program for the maintenance of this important fire protection infrastructure. Funding sources might be pursued from the Tehama County Road Department itself, through assessments to local landowners, or from CalFire or US Forest Service grants. A detailed maintenance program and treatment schedule along specific road segments would greatly assist in developing a budget and procuring funds for permanent upkeep of this fuel break infrastructure. *(Refer to #1 on Figure VIII-2 at the end of this section.)*

Thinning and Fuels Reduction along
Other Shasta and Tehama County Roads

Other fuel break improvements and infrastructure development in the Tehama County portion of this planning unit include thinning and fuels reduction along South Powerhouse Road, Manton School Road, and Cedar Ridge Road. Within Shasta County, improvements were suggested along Woodcutters Way and along the portions of Wilson Hill Road and Battle Creek Bottom Road that border the airstrip to the northwest of Manton. *(Refer to #2, 3, and 4 on Figure VIII-2 at the end of this section.)*

Lanes Valley Road Fuels Reduction and Shaded Fuel Break

Lanes Valley Road provides the most direct access from the Manton CalFire station to Paynes Creek and provides an alternate escape route for both the Manton and Paynes Creek communities if Manton Road or Highway 36E were blocked by a fire or other emergency. Since the Inskip Grade conflagration of 1973, there have been no major wildfires in the vicinity of Lanes Valley Road. As a consequence, chaparral brush has grown very high on both sides of this county road, continuing up Inskip Hill towards the fire lookout and radio relay station and threatening these facilities. A recommendation was developed for significant fuels reduction along Lanes Valley Road. Fuels work would include removal of brush along both sides of the roadway within 100 feet of the pavement. Work would continue further out on both sides of the road prism through a combination of prescribed burns and mechanical fuels treatments on lands owned by private individuals interested in conducting such work. *(Refer to #5 on Figure VIII-3 at the end of this section.)* It was also recommended that large prescribed burning projects be developed and conducted through CAL FIRE's Vegetation Management Program, which would provide fire management resources, technical expertise, and project administration, and indemnification for damages in the event of an escape. Consequently, large prescribed burns were recommended to be conducted on the east slope of Inskip Hill near Lanes Valley Road in two phases. The initial phase would be conducted between Lanes Valley Road and the PG&E power line right of way. A second phase would be conducted between the power line right of way and the lookout facility on top of Inskip Hill. *(Refer to #6 and #7 on Figure VIII-3 at the end of this section.)* Finally, in order to provide emergency access to the lookout facility, it was also recommended that significant brush removal occur along Inskip Road between the lookout facility and Lanes Valley Road, providing an east-west fuel break on the east side of Inskip Hill. *(Refer to #8 on Figure VIII-3 at the end of this section.)*

Vianet Lane and Little Inskip Hill Fuels Reduction Project

Vianet Lane traverses the east side of Little Inskip Hill through extremely heavy brush fields. Like the proposed Inskip Hill project, fuels reduction along Vianet Lane would result in a sizeable fuel break as protection against fires moving upslope. *(Refer to #9 on Figure VIII-3 at the end of this section.)*

Use of Water Conveyance Infrastructure

The water conveyance infrastructure found throughout the Manton area has the potential to provide an array of benefits to firefighters during a wildfire event. At the same time, these structures pose an obstacle to the ingress of firefighting personnel if their locations are unknown to firefighters coming from out of the area. The following paragraphs discuss specific recommendations.

Mapping and Incorporation of Water Conveyance Infrastructure into Natural Fire Management Unit Database

The recommendation was made to map in detail the location of water conveyance infrastructure, to plot this spatial information onto the map of natural fire management units, and to incorporate coordinates into the related database.

Canal Improvements

As described below, the array of canals, ditches, flumes, and other water conveyance infrastructure in the Manton area provide an array of linear features that could be of service in relation to fire control and fuels management.

Boole Ditch Improvements and Vegetation Management

The water in Boole Ditch could be made available for firefighting. This linear feature also provides a break in vegetation that could be developed as a fuel break through the thinning of small trees along the watercourse, thus protecting a number of homes, small farms, and woodlots within this portion of the Manton–Battle Creek Planning Unit. One recommendation for enhancing the use of the ditch as a water source for firefighting was construction of a small drafting pond or water tank along Forward Road installed with fittings appropriate for tanker use.

Cross Country Canal Improvements

This water distribution structure could be developed as a significant fuel break through the removal and continued control of vegetation, protecting portions of the Manton community during wildfires moving from the east or

west. In addition, by clearing vegetation along the canal, firefighters could move more quickly when conducting initial attacks on wildfires threatening the community and would have a substantial water supply immediately at hand. With additional maintenance, the penstocks connecting the Cross Country Canal with Grace Lake and Nora Lake could be used to continue the fire protection provided by this water distribution infrastructure. *(Refer to #10 on Figure VIII-4 at the end of this section.)*

Union Canal Improvements

This water transport structure runs south approximately four miles from the Cross Country Canal to the South Powerhouse and the Inskip Dam along Battle Creek's south fork. Through improvements similar to those recommended for the Cross Country Canal, this feature would extend the fire protection provided by the Cross Country Canal from the slopes of Shingletown Ridge to the South Fork of Battle Creek. *(Refer to #11 on Figure VIII-4 at the end of this section.)*

South Inskip Canal/Coleman Canal
(Inskip Dam-Coleman Dam Segment)

The South Inskip Canal is located just upslope from Battle Creek's south fork and transports water westward from the area near the South Powerhouse to the Inskip Dam and then to the Coleman Dam, where it joins the Coleman Canal and continues northwest to the Darrah Springs Fish Hatchery. If this structure could be properly cleared and maintained, it would create a midslope fuel break and would allow firefighter access to Battle Creek's South Fork Canyon, which contains significant stands of riparian vegetation. *(Refer to #12 on Figure VIII-4 at the end of this section.)* The combined canal system that runs for approximately ten miles from Grace and Nora Lakes, along the Cross Country and Union Canals, and then along the South Inskip and Coleman Canals, offers an opportunity to create a significant and continuous fuel break in this area.

South Battle Creek Canal

Roughly four miles southeast of Manton, the South Battle Creek Canal moves water northwest from the Soap Creek/Devils Canyon/Initial Gulch area in order to join the Union Canal and Cross Country Canal south of Manton. Much like the South Inskip Canal, through the clearing of brush and small timber along this canal's right of way, fire protection could be provided in an east-west direction along a four mile path directly south of the Manton area. Considering that the canal is midslope from the South Fork of Battle Creek, vegetation removal would have to be fairly extensive (100 feet or more) on each side of the structure in order to be effective. Another consideration is that once

vegetation clearing was completed, the South Battle Creek Canal route would allow firefighters access into steep portions of Battle Creek Canyon and would provide protection to the riparian and aquatic habitats found within this portion of the south fork's stream channel. *(Refer to #13 on Figure VIII-4 at the end of this section.)*

Installation of Water Tanks with High Volume Fill Spout Fittings

During wildfire emergencies, drafting of water out of ditches and streams can be time consuming. In addition, roads adjacent to such infrastructure can become cut off from firefighting vehicles, limiting the number of water sources available for fire containment. Consequently, an important recommendation is that supplemental water sources be constructed for use in firefighting efforts. *(Refer to Figure VIII-5 at the end of this section.)*

50,000 Gallon Water Tank at the Manton School

The Manton School is located along Forward Road, a main rural route in the area. In addition, the school has extensive clearance and would be accessible during almost all wildfire events. A recommendation was made to install a 50,000 gallon water tank on the school grounds which would be available for service to the Manton community and would also serve as fire protection infrastructure to the school itself.

10,000 Gallon Water Tanks throughout the Manton–Battle Creek Planning Unit

Portions of the Manton–Battle Creek Planning Unit have limited sources of firefighting water in the form of ponds, tanks, flumes, and close access to streams. In addition, such sources of water can be easily cut off from fire-fighting vehicles in the event of large, fast moving wildfires. Ten thousand gallon water tanks provide flexibility in staging firefighting resources, as they are relatively inexpensive and portable. Tanks of this size can be moved in order to maximize their utility as yearly fire conditions change or as fire threats change in the face of community development. Members of the Manton Fire Safe Council provided a list of locations considered to be candidate sites including:

Ponderosa Way
Rock Creek Road at Jack Tom Road
Forward Road at Ponderosa Way
Hazen Road at Rolling Hills Road
Manton Road at Lanes Valley Road
Lanes Valley Road at Inskip Road

Lanes Valley Road at Moulton Loop
Spring Branch Road at Manton Road
Spring Branch Road at Jellys Ferry Road

Formal Establishment of Fire Safety Zones

In the event of a large, fast moving fire in the Manton area, various routes out of the community may become blocked, preventing egress to other parts of Shasta and Tehama Counties. In such an event, the creation of formal safety zones and emergency evacuation routes would be invaluable. Just northwest of the Manton community within Sections 16 and 17 of T30N-R1E is an undeveloped landing strip which can be accessed along Wilson Hill Road. This landing strip area is relatively free of vegetation and could be utilized as a formal safety zone if a catastrophic wildfire threatened the community from the south. Another possible site for a safety zone is the CalFire station on the south side of Digger Creek just east of the Manton community's urban core. This site could provide protection to residents in the event of a wildfire moving toward the community. Finally, irrigated grazing lands in the Forward Valley area are a third possible location for a formally designated safety area, providing protection to Forward Valley residents and those residents living along Forward Road, Forwards Mill Road, and Rock Creek Road who may become cut off from escape via Manton Road, Ponderosa Way, or Viola Mineral Road. If these areas were formally designated as Fire Safety Zones, it would be important to get these safety areas placed on evacuation maps prepared by CalFire personnel. *(Refer to Figure VIII-6 at the end of this section.)*

Bureau of Land Management Projects

Spring Branch Road Repair and Maintenance

Working in cooperation with the Tehama County Public Works Department, the Bureau of Land Management is in the process of making repairs to and graveling that portion of Spring Branch Road from the BLM parking lot at Jellys Ferry Road to the agency's shooting range further east. A significant portion of the Manton–Battle Creek Fire Planning Unit's west side can be accessed in an emergency using Spring Branch Road. In addition, the roadway could be developed into a more effective control feature for fast moving grass fires that occur within this area. Consequently, it is recommended that similar road improvements be made to the entire length of Spring Branch Road from Jellys Ferry Road to Manton Road. *(Refer to #14 on Figure VIII-7 at the end of this section.)*

Bureau of Land Management Juniper Removal along Battle Creek

The Bureau of Land Management has initiated juniper removal on agency-managed lands along Highway 36 in the vicinity of Hog Lake. Additional stands of juniper are increasing on BLM lands located along Battle Creek's main stem about one half mile upstream from the Coleman Fish Hatchery near Spring Branch. These juniper stands have the potential of escalating low intensity grass fires into fast moving high intensity crown fires that can destroy mature blue oak woodlands as well as significant riparian habitat along Battle Creek. Consequently, it is recommended that the Bureau of Land Management actively pursue treatment of those juniper stands located near important riparian areas and oak woodlands adjacent to Battle Creek's main stem. *(Refer to #15 on Figure VIII-7 at the end of this section.)*

IX. Area Description and Overview
Paynes Creek–Highway 36 Corridor Planning Unit

The Paynes Creek–Highway 36 Corridor Planning Unit includes communities and significant watersheds adjacent to Highway 36, a major route over the southern Cascade Range. A number of small, unincorporated communities are located along both sides of this route. Land ownership within the planning unit is a combination of public and private holdings, including large ranches, forest lands, small noncommercial parcels, and individual home lots within semi developed communities. Portions of various significant tributaries to the Sacramento River along with their watersheds are located within this planning unit, such as the entire watersheds of Antelope, Plum, and Salt Creeks and portions of the Battle Creek and Paynes Creek watersheds. Vegetation throughout a majority of the planning area consists of grasslands and grass-dominated oak woodlands between the valley floor and the community of Paynes Creek. Upslope beyond Paynes Creek in the vicinity of Ponderosa Sky Ranch, the landscape transitions into chaparral. The eastern side of the planning unit contains portions of low elevation pine and mixed conifer forests. Throughout the planning unit, grasses and chaparral are the primary carriers of wildfires, which tend to burn upslope from the west *(See Figure IX-1).*

Major Land Management Areas and Assets at Risk

Lassen National Forest

Significant acreage of the Lassen National Forest Almanor Ranger District are located within the planning unit. A number of significant historical resources are also found throughout these lands, including remains of the Lyonsville-Red Bluff lumber flume, the High Trestle historic site, and a number of now abandoned ranch sites.

Bureau of Land Management Ishi Area Fire Management Unit

Within the Highway 36 corridor, the Bureau of Land Management oversees resources on lands owned by that agency. At the present time fuels management on these properties is fairly limited and recently entailed the removal of juniper on several parcels immediately adjacent to Highway 36 in the Hog Lake area. Fire management staff at the Redding District Field office are currently in the process of assessing area resources in order to identify high fire hazard areas as well as important resources that

would be improved through various fuels reduction efforts and other forms of vegetation management.

Roads

Highway 36E

Highway 36 represents perhaps the most dominant feature within the planning unit, either natural or man made, and to a degree characterizes development and land use within this portion of the Tehama East Community Wildfire Protection Plan project area. This linear feature acts as a significant fire break for those wildfires moving in a north-south direction. It also acts as a significant source of human caused ignitions from both traffic and general urban development that have resulted from the highway's presence. Presently CalTrans, the California Department of Corrections, and CalFire continue to work collaboratively in maintaining the fuels along this highway corridor as well as along paralleling frontage roads.

Plum Creek Road

Plum Creek Road (County Road 202) is a paved (chip seal) secondary facility which connects the community of Paynes Creek with Ponderosa Sky Ranch. Plum Creek Road passes through the north portion of the Tehama Wildlife Area to the south and the Lassen National Forest further east. This route also provides ingress and egress to various Wildland Urban Interface areas including the California Department of Corrections Plum Creek Conservation Camp, the State Department of Fish and Game facility, the community of Lyonsville, the Lyman Springs area, and the Paynes Creek Rod and Gun Club. On a yearly basis, the road surface is maintained with the filling of cracks and potholes. Hazard trees immediately adjacent to the roadway are also removed.

Communities

Dales

The community of Dales has a population of roughly 25 and is classified as a Wildland Urban Interface area by CalFire. The community is transected by Paynes Creek. Access to the area is provided by Highway 36 and Manton Road. Development within the urban core immediately surrounding the area consists of a small commercial establishment along with a number of permanent structures and mobile homes. The

closest emergency services are available at either the Red Bluff CalFire Headquarters facility or the CalFire Station in Paynes Creek.

Paynes Creek

With a population of approximately 300 residents, Paynes Creek is a federally recognized at risk community as listed in the Federal Register and is located immediately adjacent to Highway 36. The main stem of Paynes Creek flows through the urban area, and the Plum Creek watershed is a few miles south of the community. Access is provided by Highway 36, Lanes Valley Road, and Plum Creek Road, which connect to other major and minor roads leading out of the area. The developed area of Paynes Creek consists of two school sites: an operating elementary school and another facility that soon will be opened. A general store and various public utility facilities are located in the urban core. A seasonal CalFire facility is located just outside of town as is a Department of Correction conservation camp. Both of these facilities can provide fire and other emergency services.

Ponderosa Sky Ranch

Ponderosa Sky Ranch is an unincorporated community located roughly 10 miles east of Paynes Creek just off Highway 36. No commercial or public utility facilities are located within the vicinity, nor are there any emergency services. A water tank was installed by a now defunct volunteer fire department; the tank is presently unused. The urban core of Ponderosa Sky Ranch is currently protected from advancing wildfire by Highway 36 to the north and down slope to the south by Ponderosa Way and a recently installed fuel break. The fuel break also provides protection from wildfire advancing from the west, and several US Forest Service and Sierra Pacific Industry wildland roads provide protection on the community's eastern flank. The main stem of Paynes Creek flows downslope of the community to the south. The closest emergency services are provided by the CalFire station at Paynes Creek.

Watersheds

Plum Creek

The headwaters of this minor tributary to Paynes Creek are located within the Central Cohasset Planning Unit just north of the Lyonsville Wildland Urban Interface area. The creek flows east through a number of developed sites including Wilson Ranch, the Paynes Creek Rod and Gun Club, and a state facility shared by CAL FIRE, California Department of Corrections, and California Department of Fish and Game.

Other developed sites are located along Plum Creek Road which parallels the stream course between Ponderosa Sky Ranch and the Paynes Creek community. The terminus of the stream is at the Mt Lassen Trout Farm located adjacent to Highway 36 approximately five miles west of Paynes Creek. In addition to WUI areas and other developed sites, the Plum Creek watershed contains oak woodland habitat for the Tehama Deer Herd, which has experienced a marked decline in population over the past ten years. A portion of this reduction in population has been attributed to the loss of oak woodland habitat to brush stands.

Paynes Creek

The Paynes Creek watershed covers an area of approximately 93 square miles (59,540 acres) with headwaters located approximately six miles east of Mineral. The stream flows eastward towards the Sacramento River and the Bend District located just north of Red Bluff. The main stem of the creek is known to support fall run salmon and has the potential to support steelhead when water conditions are adequate. In recent years, however, surface flows have disappeared during the late spring, and spawning gravels have become insufficient to support continuous vigorous runs. Significant water diversions are made at 16 locations along the main stem. Paynes Creek has been identified by USFWS as a stream having a high potential for sustaining natural production of spring-run Chinook salmon and steelhead, promoting genetic diversity for these species and successful fisheries habitat restoration.

Salt Creek

Salt Creek is another minor intermittent tributary to the Sacramento River flowing from the Tuscan Springs area immediately south of the Tuscan Buttes. The stream channel is roughly parallel to Highway 36. Ranching is the only economic activity found in the watershed.

Flooding

Like the other watersheds within the Tehama East Community Wildfire Protection Plan project area, the Paynes Creek and Salt Creek watersheds have a combination of topography, soils, and climate which often result in significant flooding. These tributaries to the Sacramento River have sharply incised canyons with steeply sloping walls and narrow stream channels. In addition, the shallow rocky soils in the area yield high water runoff. During frequent heavy precipitation events at upper elevations, narrow stream courses deliver high volumes of flood water in a short period of time. These hazards can be exacerbated by the removal of vegetation attributable to

fire or other events. As a result, wildfire represents both a direct and indirect threat to local communities if wildland fuels are not adequately managed.

Current Fire Protection Infrastructure

Roadside Improvement Projects

Highway 36 Fuels Maintenance

The California Department of Transportation, CAL FIRE, and California Department of Conservation continue to collaborate on a shaded fuel break and fuels reduction project along the Highway 36 right-of-way from Hog Lake just east of Red Bluff to the Plumas County line. The fuels treatments completed in connection with this project provide partial protection to the communities of Dales, Paynes Creek, Ponderosa Sky Ranch, Battle Creek Estates, and Mineral. Project work is partially funded by CalTrans in order to meet their sight clearance standards. The project is ongoing, although not all areas are treated each year. Annually, project work is completed along approximately 25 miles of roadside. These efforts include mechanical removal of chaparral and timber species along both sides of the highway right-of-way, as well as along a number of auxiliary roads immediately adjacent to the highway prism. This linear feature creates an east-west fuel break along the south rim of Battle Creek Canyon.

Highway 36 Power Line Fuel Break

This continual maintenance problem entails the maintenance of a 70-foot wide fuel hazard reduction project along the south side of Highway 36 under power lines between Hog Lake and Ishi Road.

Ponderosa Sky Ranch Fuel Break

This project begun in June of 2002 is an ongoing effort between CalFire and the Sky Ranch Property Owners Association (SRPOA). Fuel break project work was completed using CalFire equipment and fire crews from Ishi Conservation Camp. The fuel break incorporates existing roads and an airport runway along with fuel reduction done by CalFire equipment and CalFire crews in order to form a fuel break around the entire Ponderosa Sky Ranch community. The project includes opening roads for engine access to water sources and tree removal to provide a flight path for helicopters using local ponds. In 2003 the SRPOA implemented an ongoing maintenance plan to keep this vital ring of protection effective. As part of this plan, the southern portion of the fuel break was widened and improved using CalFire equipment and crew. The intent is

to improve one section annually, thus reducing the costs while still preserving the fuel break. Additional roadside thinning of timber stands on the north side of the community is conducted on a yearly basis by California Department of Conservation crews.

Paynes Creek Sportsman Club Fuels Reduction Project

The Paynes Creek Sportsman Club and CalFire partnered in this project, which addresses fire and fuels management issues within the Wildland Urban Interface and improves wildlife habitat as well. This mechanical treatment and fuel break project encompasses roughly 1,500 acres of recreational wildlands. Specifically, project work entails brush crushing and winter burning in an effort to provide defensible space for cabins located inside the project boundaries.

Hogsback/Plum Creek Fuels Reduction Project
(Hogsback Ridge Fire Management)

This project is located approximately five miles southeast of the Paynes Creek community and entails mechanical fuels treatment and prescribed burning on approximately 3,400 acres of land managed largely by the U.S. Forest Service. A few small private parcels are included in the project area as well. Roughly 325 acres of the project site is located within the Tehama Wildlife Area. The goal of the project was to reduce the intensity and severity of a wildland fire in an area that has experienced numerous large fires over the past 15 years. One portion of the project area consists of a 40-acre pine plantation located along Ponderosa Way which required some mechanical brush removal prior to burning. The project design called for low to moderate intensity prescribed burns extending up to 600 feet on both sides of Plum Creek Road and Hogsback Road. Between 50% and 70% of the brush was retained in order to provide cover for migrating deer herds. This fuels reduction project provides a ridge top fuel break to assist in fire suppression activities. The majority of the mechanically treated areas were completed using hand crews while a small portion of the site utilized earthmoving equipment after consultations were held with various resource specialists. In addition, low to moderate prescribed burns were conducted throughout the entire project area after heavy concentrations of brush and woody material were removed. Existing roads and natural barriers were used for control lines where available. In addition to this project, a 10,000-gallon water tank has been placed approximately nine miles up Hogsback Road that is filled and ready for fire suppression use.

SPI Fuels Reduction Project

Sierra Pacific Industries is conducting fuels reduction work along Ponderosa Way near the confluence of the north fork of Antelope Creek and Dead horse Creek in the vicinity of Shelton Ridge. This work will be completed within four years and will result in the creation of a 103-acre shaded fuel break.

Bend ACEC Juniper Removal Project

Juniper has begun to invade oak stands within the Bend Area of Critical Environmental Concern along Highway 36 to the north and south of Hog Lake. Infestations have also been identified on Bureau of Land Management (BLM) properties just south of Battle Creek. In 2007, BLM and California Department of Conservation crews treated approximately 100 acres of juniper-infested blue oak woodlands by cutting and piling stems within ten feet of oak drip lines. The goal of this project is to reduce fire intensities under mature oaks in order to prevent crowning of regularly occurring grassfires, thus preventing the destruction of valuable oak woodland habitat. Initial funding for project work was provided by the California Deer Association.

Road Features

Hogsback Road, Plum Creek Road, Lanes Valley Road, and High Trestle Road all provide some level of protection from advancing fire under noncatastrophic fire conditions. Spotting and high flame heights can limit the usefulness of these features as fire protection infrastructure other than as access roads or as points from which to conduct backfire operations.

Inskip Butte Lookout and Radio Relay Facilities

The lookout facility on Inskip Butte just north of the Paynes Creek community provides visual identification coverage for much of the northern portion of the Paynes Creek–Highway 36 Corridor Planning Unit. A radio relay station is also located at the site.

Tuscan Buttes Communications Facility

The fire lookout and communications facilities on Tuscan Buttes is operated by CalFire and provides visual identification of wildfire along the westernmost portion of the planning unit, including oak woodlands and grasslands as well as the valley floor. In addition, an array of CalFire and private party electronic communications equipments are located at the Tuscan Buttes site as well.

Landing Strip at Ponderosa Sky Ranch

In addition to the fuel break surrounding the community, the Ponderosa Sky Ranch landing strip is well maintained and provides both a fuel break and a staging area for fire fighting equipment and personnel.

Priorities and Summary of Proposed Projects

The significant resources found within the Paynes Creek–Highway 36 Corridor Planning Unit consist of:

- Rural communities
  - Dales
  - Paynes Creek
  - Ponderosa Sky Ranch
  - Battle Creek Estates
  - Lyman Springs
  - Lyonsville
  - Panther Spring
  - Knass Spring
  - Tail Holt Spring
- Lands used for commercial purposes such as range lands and timber production
  - The watersheds of Paynes Creek, Plum Creek, the north and south forks of Antelope Creek, and Finley Lake, all containing an array of important environmental values, including:
    - Sensitive, threatened, and endangered plant and animal species along with their critical habitat
    - Water quality and quantity
    - Riparian habitats along major watercourses
    - Properly functioning aquatic ecosystems
  - Cultural and historical artifacts, including significant sites of human occupation
  - Potential and current non-natal rearing habitat for juvenile Chinook salmon found at the mouths of Seven Mile Creek and Salt Creek
  - Critical local roads, including:
    - Plum Creek Road
    - Ponderosa Way
    - Hogsback Road

- Significant electrical, telephone, and gas transmission infrastructure
- Disbursed recreational facilities such as the Paynes Creek Rod and Gun Club

Introduction

In terms of establishing the priority of recommended projects, the protection of lives and private property were of paramount importance. In recognition of the landscape scale interconnectedness of watershed components, those projects which provided landscape scale protection of animal and watershed resources were next in importance. Finally, projects that protected permanent cultural features in the area were given consideration. The following descriptions and discussions of projects to protect the resources within the Paynes Creek–Highway 36 Corridor Planning Unit have been prioritized based upon the values placed on the primary resources these projects would protect.

Paynes Creek Fuels Reduction and Shaded Fuel Break

The community of Paynes Creek contains an array of important urban assets and is surrounded by chaparral stands, oak woodlands, and grasslands on all four sides. Members of the community recommended that a combination of prescribed burns, oak thinning, and shaded fuel breaks be developed and maintained around the urban core as well as along Highway 36. Specifically, project work would entail the proposed work discussed in the following paragraphs.

Collaboration with CalTrans and PG&E.

In order to expand current fuels reduction and thinning work along the portion of Highway 36 adjacent to the Paynes Creek community, any projects in this area should be coordinated with CalTrans and PG&E. As tentatively envisioned, removal and processing of chaparral and small trees would extend approximately 200 feet from the highway right-of-way along a two mile stretch between the PG&E twin tower transmission line crossing to roughly one mile south of the junction of Highway 36, Lanes Valley Road, and Plum Creek Road. The primary goals of this project are to develop greater community protection and to maximize project cost efficiency by tying together newly developed fuels reduction work with work already being conducted on an ongoing basis by CalTrans within the state highway right-of-way and by PG&E along their power line right-of-way. *(Refer to #1 on Figure IX-2 at the end of this section.)*

Fuels Reduction and Thinning Along Plum Creek Road

Similar fuels reduction and thinning would be conducted along Plum Creek Road between its junction with Highway 36 and the State of California facilities located approximately 1.5 miles south of the Paynes Creek community. *(Refer to #2 on Figure IX-2 at the end of this section.)*

Shaded Fuel break at Paynes Creek School

A shaded fuel break would be developed and oaks would be trimmed along the south property line of the new Paynes Creek School property and facility. This portion of the project would protect the school facilities from fires originating in wildland areas to the south, and it would prevent the spread of fires that may develop within the Paynes Creek urban core. *(Refer to #3 on Figure IX-2 at the end of this section.)*

Howell Ridge Fuels Reduction Project

Howell Ridge parallels Highway 36, beginning just south of Ponderosa Sky Ranch and ending just east of the Paynes Creek community. This major ridge borders Paynes Creek to the south along the stream's ecologically significant riparian corridor. Howell Ridge also lies north of the property boundaries of the Paynes Creek Rod and Gun Club, Wilson Ranch, and the state facilities on Plum Creek Road. Both the north and south faces of Howell Ridge have very heavy accumulations of chaparral fuel that are at risk of ignition from sources of development along Ponderosa Way, Plum Creek Road, and an undeveloped ranch road on the ridgetop that connects these two more traveled routes. Numerous potential ignition sources are also found within the Ponderosa Sky Ranch and Paynes Creek urban areas. Fuels reduction work along the north side of Howell Ridge could be leveraged by fuels reduction efforts already completed at a pine plantation managed by Sierra Pacific Industries. In addition, the unpaved wildland road on the top of Howell Ridge could be utilized as a fire control line during initial prescribed burning activities and could then be developed into a larger, more developed, permanent fuel break. Opportunities may exist for shared project funding between private landowners and federal agencies holding nearby lands (i.e., Lassen National Forest and Bureau of Land Management), as these federally owned lands would be protected by this project. Financial contributions or in kind match of equipment and labor might also be provided by the California Department of Fish and Game, which manages lands within the nearby Tehama Wildlife Area. *(Refer to #4 on Figure IX-2 at the end of this section.)*

Plum Creek Road/High Trestle Road Fuel Break

Just south of Howell Ridge, Plum Creek Road traverses the summit of Plum Creek Ridge which runs east to west separating the watersheds of Oak Creek and Plum Creek. Numerous fires have swept through this area including the very large Finley Fire of 1990. High Trestle Road traverses the south slope of Plum Creek Ridge connecting Plum Creek Road with Hogsback Road, a primitive yet highly used county road. If these linear features were more fully developed and maintained as formal fuel breaks, the state facilities at Plum Creek, the watersheds and riparian areas of Plum Creek, and the historical site on High Trestle Road could all be better protected from fires moving upslope from chaparral lands further to the west. If the road surface and vegetation were properly maintained, High Trestle Road would also allow escape on either Plum Creek Road or Hogsback Road if one of the other routes became cut off from a large, fast moving fire. *(Refer to #5 on Figure IX-2 at the end of this section.)*

Ponderosa Sky Ranch Airport Fuels Reduction, Maintenance and Extension

Over the years, numerous attempts have been made to utilize the airstrip at Ponderosa Sky Ranch as fire protection infrastructure for that community. Chaparral species adjacent to this area continue to develop into heavy stands of flashy fuels that threaten the community from ignition sources along Highway 36. A recommendation was made that the Ponderosa Sky Ranch community develop the means to permanently maintain the fuels within the airstrip area. *(Refer to #6 on Figure IX-2 at the end of this section.)* It was also suggested that additional prescribed burning or other types of fuels reduction work be conducted between the community and Highway 36. Such project work would help to protect Ponderosa Sky Ranch and would also protect valuable aquatic and riparian habitats found along nearby Paynes Creek if it was extended several miles east to west along the state highway. *(Refer to #7 on Figure IX-2 at the end of this section.)*

Power Line Right-Of-Way Maintenance Between Ponderosa Sky Ranch and Lyman Springs

The Lyman Springs area contains the historic site of a lumber mill that once operated at the turn of the 20th Century. At the present time, a small outpost of houses and recreational structures is located there. A wooden pole power line connects utility facilities at Ponderosa Sky Ranch with the Lyman Springs community. If more fully managed for vegetation, this power line could provide a fuel break extending roughly two miles between these two communities. If properly developed and maintained, the

right-of-way area could be used for initial attack of chaparral fires moving upslope from chaparral lands to the west, or down slope from immediately adjacent timber stands. Such a linear fuel break would also provide partial protection to the Lyman Springs community and to the developing pine plantations managed by Sierra Pacific Industries just east of the power line right of way. *(Refer to #8 on Figure 2 at the end of this section.)*

Battle Creek Estates Fuel Project

On the north side of Highway 36 opposite Ponderosa Sky Ranch is a relatively new residential development called Battle Creek Estates. At the present time a few scattered homes have been constructed within the area's heavy stands of chaparral vegetation and oaks. It was recommended that a fuel break be developed around the perimeter of the estates area. It was also suggested that the developers of Battle Creek Estates fund the purchase of a chipper for use by the community's residents. *(Refer to #9 on Figure IX-2 at the end of this section.)*

2007-2008 Panther Spring / Boonedocks Area Fuels Treatment

Project work consists of an additional 591 acres of mastication, hand thinning, piling, and prescribed burn treatments near the Panther Spring / Boonedocks communities. *(Refer to Figure IX-3 at the end of this section.)*

2008-2012 Hogsback Road / Finley Lake Fuels Treatment

This 2,952-acre mastication and prescribed burning project continues earlier US Forest Service efforts that will be executed over multiple years at various sites along Hogsback Road. *(Refer to Figure IX-3 at the end of this section.)*

Knass Spring Improvements

The Knass Spring recreational community is located just south of Panther Spring along Ponderosa Way. Within the area, a number of cabins, a road system, and a small pond has been developed. Many of the development features found in the area could, with some improvements, be developed into significant fire fighting and fire management infrastructure. The most significant linear feature in the area is Ponderosa Way, which lies less than a mile to the west of these communities. With some clearing and annual grading, Ponderosa Way would provide east-west fire protection and would also speed access to wildfires occurring in the immediate area and further south towards the Mill Creek and Deer Creek watersheds. In addition, it was recommended that funding be developed for roadside thinning of interior secondary roads throughout the

Knass Spring area and of other rural roads surrounding the structures in the vicinity of Tail Holt Spring. Improvements to these roads would enhance their use as fuel breaks and would improve access to the north, south, and east sides of these communities. Finally, it was recommended that the pond located in the center of the inhabited area of Knass Spring be developed to increase its capacity and that water tanks be installed as a backup source for fire fighters in the event the pond goes dry. *(Refer to Figure IX-3 at the end of this section.)*

Tramway Road Shaded Fuel Break

Tramway Road directly connects the Lyonsville–Lyman Springs urban area with Highway 36 and as a result has become a major escape route during wildfire events. In addition, if forest and chaparral fuels were reduced along the roadway, the ability of this linear feature to protect the southeast side of these communities would be dramatically increased. *(Refer to Figure IX-3 at the end of this section.)*

Little Giant Mill Road Shaded Fuel Break.

Like Tramway Road, the Little Giant Mill Road directly connects the Lyonsville–Lyman Springs urban area with Highway 36 and is another major escape route. This road traverses similar vegetation as Tramway Road; consequently, if vegetative fuels were reduced, an additional level of protection would be provided to residents and visitors of the Lyonsville–Lyman Springs community, especially from fires approaching from the southwest. *(Refer to Figure IX-3 at the end of this section.)*

Yellowjacket Road–Tamarack Road Shaded Fuel Break

If properly developed as a shaded fuel break, the parallel alignment of Yellowjacket Road with Ponderosa Way would make this linear feature an additional source of fire protection that could be used to defend against wildfires moving in an east or west direction. The road is located near the transition line between chaparral and timberland, making it particularly useful in defending valuable pine stands from fires moving upslope out of the east. Tamarack Road could also be developed into an additional east-west fuel break if a significant volume of brush and forest fuels were removed. *(Refer to Figure IX-3 at the end of this section.)*

High Trestle Road Fuels Reduction

High Trestle Road connects Plum Creek Road at the northerly end and Hogsback Road on the southerly end. If the road surface and vegetation were properly maintained, this road could be utilized as an east-west fuel break and would also allow escape on either

Plum Creek Road or Hogsback Road if one of the other routes became cut off from a large, fast moving fire.

Installation of 50,000 Gallon Water Tank with High Volume Fill Spout Fittings at the Paynes Creek School

In the near future, a new elementary/middle school will be opened on the southeast side of the Paynes Creek community. Although the school grounds are cleared, the facility is located adjacent to a considerable amount of wildland fuels that have developed in adjacent oak woodlands and grasslands. Through the installation of a 50,000 gallon water tank on the school's property, a considerable volume of water is available for fires occurring within the community and at its urban fringe. This tank would also provide water for fires occurring further south in the vicinity of the Tehama Wildlife Area or on lands adjacent to the Ishi Wilderness. By locating the tank in this highly visible area, vandalism could be kept to a minimum. *(Refer to Figure IX-4 at the end of this section.)*

Installation of 50,000 Gallon Water Tank with High Volume Fill Spout Fittings in the Vicinity of Lyonsville/Lyman Springs

The combination of Plum Creek Road, Little Giant Mill Road, and Tramway Road provides primary access to the Lyonsville community from Highway 36. All of these roads are well maintained and can provide rapid access to the Lyonsville and Lyman Springs urban areas. Consequently, the installation of a 50,000 gallon water tank at either at the intersection of Plum Creek Road and Little Giant Mill Road or at the intersection of Tramway Road and Little Giant Mill Road would provide a water source that would benefit fire fighting needs in the immediate vicinity and would also be of considerable value to fire equipment traveling Highway 36 or to units fighting fire further south in the wildland areas of the Central-Cohasset Planning Unit. *(Refer to Figure IX-4 at the end of this section.)*

Installation of 50,000 Gallon Water Tank with High Volume Fill Spout Fittings at Dales

The community of Dales is located at the major intersection of Manton Road and Highway 36. During very dry months when surface flows within Paynes Creek are lowest, drafting of water supplies can be time consuming. In addition, the heavy fuels and high fire danger found along the Lanes Valley Road could result in a very large wildfire that would cut off the transport of water from the Paynes Creek area,

resulting in lengthier travel from Red Bluff or Manton. The installation of a large water tank at this location would provide protection to the immediate Manton community and would make water readily available to fire fighting crews working within the central and western portions of both the Battle Creek–Manton and the Paynes Creek–Highway 36 Corridor Planning Units. *(Refer to Figure IX-4 at the end of this section.)*

Installation of 10,000 Gallon Water Tanks with High Volume Fill Spout Fittings throughout the Paynes Creek–Highway 36 Corridor Planning Unit

Like other areas of eastern Tehama County, the Paynes Creek–Highway 36 Corridor Planning Unit has limited sources of water with which to refill tanker units. The Paynes Creek Volunteer Fire Department, the Manton Fire Safe Council, CalFire staff, and members of the Paynes Creek community have recommended candidate sites for installation of medium size water tanks:

Intersection of Plum Creek Road and Hogsback Road
Intersection of Plum Creek Road and Ponderosa Way
Intersection of Highway 36 and Lanes Valley Road

(Refer to Figure IX-4 at the end of this section.)

Refurbishment of Ponderosa Sky Ranch Water Tank

At the present time, the water tank located in Ponderosa Sky Ranch stands unused and is in need of new quick fill fittings. If refurbished and maintained, this water supply infrastructure could provide considerable fire fighting water to Ponderosa Sky Ranch, Battle Creek Estates, Lyonsville, and the Lyman Springs area further to the south. *(Refer to Figure IX-4 at the end of this section.)*

Construction of Access Road from Ponderosa Way to Highway 36

Ponderosa Way forms the major access road into the community of Ponderosa Sky Ranch. During a wildfire event, residents would have to evacuate either east via the paved portion of Ponderosa Way and onto Highway 36 or by way of the rough, unpaved portion of Ponderosa Way to the south. Both routes could become congested if large numbers of residents attempted to evacuate at the same time using this road. It was recommended that a second access route be developed to the west by the construction of a connecting spur between Highway 36 and Ponderosa Way on the west side of the community.

Classification of Communities as Wildland Urban Interface Areas

An Intermix Community is described in the Federal definition of Wildland Urban Interface (WUI), as reported in the Federal Register of 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."

It is recommended that the coordinator of the Tehama-Glenn Fire Safe Council initiate those processes required in order to have certain rural communities formally classified as a Wildland Urban Interface area, thus increasing the potential for local residents to receive technical assistance and startup funds for community fuels reduction efforts. These communities are described below. *(Refer to Figure IX-5 at the end of this section.)*

Panther Spring, Boonedocks, Lyonsville, and Lyman Springs

The remote communities of Panther Spring and Boonedocks are located approximately ten miles south of Ponderosa Sky Ranch along Ponderosa Way. Although there are few permanent residents in the area, a significant number of private recreational structures are located in the vicinity that are in need of some form of organized public and private efforts to assure that adequate fire protection measures are accomplished. This area is surrounded by Lassen National Forest lands; chaparral and thick stands of small timber create significant ladder fuels. When these multiple sources of ignition are combined, the chance of a catastrophic wildfire is considerable. The Lyman Springs–Lyonsville area faces a similar situation in that a number of inhabited structures are in close proximity to federal lands, have significant fuel accumulations, and are at a significant risk from roads and other sources of ignition. An evaluation of the risk factors used in establishing these interface areas—including fire behavior potential, values at risk, and infrastructure—indicate that the residents and urban development in the vicinity of Panther Spring, Boonedocks, Lyonsville, and Lyman Springs are at significant risk of wildfire.

Fire Behavior Potential: Steep slopes in the vicinity of Panther Spring can result in structures being threatened by fire that is rapidly advancing upslope. Steep topography also limits evacuation of residents out of the area and limits access by fire fighting personnel and equipment into the area. A significant portion of the fuels surrounding and within the community consist largely of chaparral and thick stands of small timber. Although the Lyonsville and Lyman Springs communities are located on relatively flat terrain, they also have thick stands of small diameter trees that can create ladder fuels for large crown fires. The vegetative fuels in all three communities can become extremely flashy during hot weather, especially during extremely dry years. As a result, wildland fires can spread quickly with only a minor amount of wind

Values at Risk: Development within the Panther Spring, Boonedocks, Lyonsville and Lyman Springs communities includes scattered cabins, ranches, and other housing, as well as significant outbuildings that are in some instances less than a mile apart.

Recommendations regarding Proposed WUI's

It is recommended that the coordinator of the Tehama-Glenn Fire Safe Council initiate those processes required in order to have the communities described above formally classified as Wildland Urban Interface areas. This would also increase the potential for local residents to receive technical assistance and startup funds for community fuels reduction efforts.

X. Area Description and Overview
Central–Cohasset Planning Unit

The Central–Cohasset Planning Unit is remote and has the lowest population density of the entire Tehama East Community Wildfire Protection Plan project area. Land ownership patterns in the area generally take the form of large ranches, state and federal wildlands, and lands managed under conservation easements (Figure X-5). A number of significant tributaries to the Sacramento River flow through the planning unit that have their headwaters further to the east outside the project's area of analysis, notably Mill Creek and Deer Creek. These two streams are considered to be significant anadromous fisheries or have this potential with changes in management practices and development of various restoration projects. A number of minor tributaries flow through the area as well, including Dye Creek, Toomes Creek, and Pine Creek. These normally intermittent streams are considered to have environmental value as riparian habitat and as a nonnatal rearing area for juvenile Chinook salmon *(See Figure X-1 at the end of this section)*.

Major Land Management Areas and Assets at Risk

Ishi Wilderness

Within the Central–Cohasset Planning Unit lies approximately 42,600 acres of mixed conifers, oak woodlands, chaparral lands, and grasslands managed by the Lassen National Forest as the Ishi Wilderness. This portion of the forest is the only wilderness that preserves a major component of the Sierra Cascade Foothill ecosystem. The landscape is a network of flat ridges, sheer canyon walls, deep ravines, caves, and pillars. The Ishi Wilderness also contains significant habitat for golden eagles, several species of falcon, and other raptors. Mill Creek and Deer Creek run through the wilderness and contain remnant runs of steelhead and spring run Chinook salmon. Other habitat resources include those associated with oak woodlands, grasslands, chaparral, riparian areas, and potential habitat for the Butte County Fritillaria. The area also contains a portion of the Brush Mountain Wild Horse Territory and portions of the Lassen National Forest's Tehama and Cone Ward South range allotments. Aquatic resources contained within the boundaries of the Ishi Wilderness include the lower segments of both Deer and Mill Creeks, both of which have been candidates for classification as federal Wild and Scenic Rivers. Other significant ecosystems found within the Central–Cohasset Planning Unit include the Graham Pinery and Beaver Creek Pinery, both located inside the Ishi Wilderness. The Burroughs Pinery is located

in the area just south of the Ishi Wilderness boundary. These isolated stands of ponderosa pine and oaks are isolated by topography from other ecosystems and are a rare biological component of the Sierra Nevada foothills. As result, the three pinery properties are considered significant biological resources within the Lassen National Forest.

Like the rest of the Lassen Foothill area, the Ishi Wilderness contains ecosystems that developed under conditions of continuous fire events. Average fire occurrence within this portion of the Central–Cohasset Planning Unit is approximately five years, and a majority of the area has been burned during the last 60 years. Almost 80 percent of the Ishi Wilderness was burned during the 1990 Campbell Fire, including a large portion of the Graham Pinery. A primary management goal for the Ishi Wilderness is the reestablishment of a natural fire regime, which has been altered by years of fire control. This objective, however, is modified in those situations where the potential exists for a particular wildfire to endanger public safety or to damage public and US Forest Service lands outside the wilderness boundary. In recognition of the significance that wildfire plays as a natural process, Lassen National Forest fire and fuels managers are utilizing naturally caused wildfires under specific conditions ("wildland fire use") to manipulate vegetation. To effectively implement wildland fire use, fire managers rely on a comprehensive fire management plan that establishes the conditions under which naturally ignited wildfires will be used to manage native vegetation. The development of these plans includes analyses needed to support the wildland fire use decision and considers the potential benefits from wildland fire, long-term consequences of management decisions, and impacts of decisions across large landscapes.

Bureau of Land Management Area of Critical Environmental Concern

The Federal Land Policy and Management Act (FLPMA) establishes Areas of Critical Environmental Concern on BLM-administered lands. On these federally managed lands, it has been determined that "special management and attention is required...to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources and other natural systems or processes, or protect life and safety from natural hazards." Two such specially designated sites, the Deer Creek ACEC in the Central–Cohasset Planning Unit and the Bend ACEC located within the Sacramento River Corridor Planning Unit, have been determined to contain an array of natural and cultural resources considered significant enough to require special protection by BLM. The Deer Creek ACEC unit consists of four parcels totaling 900 acres located along Deer Creek in close proximity to the Ishi Wilderness. Through the BLM's resource assessment and land planning process, a number of significant

resource values and issues have been identified within these parcels. These include:

- The long term protection of nesting Raptors,
- The protection of archeological resources such as the Ishi Caves and the Yahi Indian Camp,
- Protection of wilderness values within the BLM parcel located adjacent to the Ishi Wilderness,
- Maintenance of fisheries habitat found in Deer Creek
- Maintenance of primitive recreation opportunities within the Deer Creek watershed.

Vina Plains Preserve

The 4,600 acre Vina Plains is an example of California annual grasslands and vernal pools on the upper terrace of the Sacramento Valley. These lands are owned by The Nature Conservancy (TNC) in order to preserve these relatively rare aquatic environments. At the present time, TNC is conducting a carefully developed and controlled program of prescribed burns and grazing regimen in order to maintain the viability and biological diversity of these habitats.

Dye Creek Preserve

The Gray Davis Dye Creek Preserve is a 37,540-acre expanse of grasslands, blue oak woodlands, and volcanic buttes, located within the 900,000 acres of TNC's Lassen Foothills Project area. Preserve lands are dissected by the vertical cliffs of Dye Creek Canyon and the diverse riparian forests of Dye Creek. The Dye Creek Preserve lies in the heart of the Lassen Foothills Project area where TNC is actively engaged in community-based conservation efforts. The land serves as a site for the research, development, and demonstration of ecological management and restoration techniques such as prescribed burning. Research and development efforts are conducted in the context of a working ranch, so that methods that are successfully developed may be applied on privately owned ranches.

The Nature Conservancy has also continued to operate preserve lands as a working ranch, leasing grazing rights to a private rancher who manages his cattle in a manner that focuses on the health and sustainability of foothill landscapes. The land also functions as a nature preserve, outdoor classroom, and laboratory promoting cooperative conservation, restoration, and community outreach activities. Research related to grazing and prescribed burning is aimed at maintaining and increasing the diversity of grasslands, oak woodlands as well as other plant and animal communities by discouraging invasive non-native plants. Research at the ranch has demonstrated

that controlled burning effectively controls medusa-head and star-thistle—both troublesome, invasive weeds. These burning projects also significantly reduce fuel loads and are aiding in efforts to reestablish natural fire regimes within this portion of Tehama County's eastside area. Ongoing projects are underway to restore streamside habitats along lower Dye Creek. Trees, shrubs, and native grasses have been planted, and the positive effects of this restoration program are beginning to be recorded.

Deer Creek ACEC

The Deer Creek ACEC is located within the Central–Cohasset Planning Unit approximately 20 miles southeast of Red Bluff. The area contains approximately 5,000 acres of grasslands, oak woodlands, and chaparral, of which 620 acres are directly managed by BLM. These specially managed lands lie adjacent to the Ishi Wilderness, and a number of resource management goals are shared by BLM and the Lassen National Forest. Deer Creek Canyon transects the ACEC area and contains an array of nesting raptors including Peregrine Falcons. The canyon also contains significant fisheries and riparian habitat provided by Deer Creek along with a nationally significant complex of cultural sites related to the area's inhabitance by the Yahi Tribe. Fire management in the Deer Creek ACEC area is a collaborative effort between the Bureau of Land Management, CAL FIRE, and the U.S Forest Service in terms of fire suppression as well as post fire restoration efforts. BLM and U.S. Forest Service personnel have also worked closely in developing and implementing a Prescribed Natural Fire Plan for wildfires occurring within these wildland areas.

Tehama State Wildlife Area

These 46,862 acres of steep canyons and plateaus contain oak woodland, grassland, and chaparral landscapes. The wildlife area's primary objective is to provide winter range for the Tehama herd of black tailed deer. Wild pigs and turkeys are also found in the area. The main entrance to the property is approximately three miles from the community of Paynes Creek. Primary access to the wildlife area is by way of Plum Creek Road, Hogsback Road, and Ponderosa Way. Access can also be made via various primitive ranch roads.

Special Areas

Research Natural Areas

Research Natural Areas (RNA's) are lands set aside in perpetuity as baselines of natural ecological conditions. These areas are established in order to: (1) contribute to the preservation of examples of all significant natural ecosystems for purposes of

research and ecological study, (2) provide gene pools, and (3) protect habitats of rare and endangered species of plants and animals. These highly valuable unique landscapes have typical and/or unique characteristics of scientific interest and importance. Within the Central–Cohasset Planning Unit, the Graham Pinery (660 acres) and Indian Creek (3,890 acres) have been identified as candidate sites for inclusion into the Research Natural Area designation of Lassen National Forest. Until final selection, National Forest personnel manage candidate areas in a manner that will maintain their inherent qualities. This includes protection from catastrophic wildfire. The National Forest Management Act (NFMA) regulations direct that Forest planners recommend new RNA's for establishment in order to meet the needs of future research, ecological study, and education. As a result, other significant sites within the western portion of the Almanor Ranger District will require identification and protection. Proactive assessment, identification, and protection of significant biological areas has been incorporated into the strategies and projects listed elsewhere in this Tehama East Community Wildfire Protection Plan document.

National Natural Landmarks

The National Natural Landmarks (NNL) program was established to (1) encourage the preservation of sites illustrating the geological and ecological character of the United States, (2) enhance the educational and scientific value of the site preserved, and (3) foster a public concern in the conservation of the Nation's heritage. The National Park Service conducts theme studies to identify potential sites that appear to meet the criteria for natural landmarks. Four general natural history themes are used to select areas: (1) Landforms of the Present, (2) Geological History of the Earth, (3) Land Ecosystems, and (4) Aquatic Ecosystems. Through the forest planning process, recommendations are made to the National Park Service as to areas to be included in the National Registry of Natural Landmarks. Forest Supervisors can also recommend sites to the National Park Service outside of the forest planning process. After evaluation by the National Park Service, the Secretary of the Interior can then approve the recommendations. Once an area is designated as a National Natural Landmark, the Regional Forester and Forest Supervisor take the appropriate steps to protect the important features in order to provide that the integrity of the landmark is protected and that no restrictions are placed on managing the site under the multiple use concept. Within the Central–Cohasset Planning Unit, Devils Parade Ground has been recommended for inclusion as a National Natural Landmark. Within this area, black oak vegetation is intermixed with stands of blue oak, digger pine, and fringe mixed

conifer. The area covers 710 acres just east of the Ishi Wilderness. Natural integrity is high, as there is little visitation to this rugged portion of the Lassen National Forest.

Special Interest Areas

Special interest areas (SIA's) include areas of unusual or outstanding botanical, aquatic, scenic, geologic, zoological, paleontological, cultural, or other unique characteristics that may merit special attention and management. Forest planning direction is to identify potential SIA's and to establish qualified sites in the Forest Plan for approval by the Regional Forester. There are a number of areas on the Lassen National Forest that may be appropriate for SIA status, and a number of potential sites have been initially identified. Screening is based upon the uniqueness and relative significance of the area and special management needs. Once the SIA classification has been applied, lands under this designation are managed in a manner that protects their unique resources and, where appropriate, that fosters their public use and enjoyment. The Forest Service manages each formally designated SIA through a Special Interest Area plan. These plans are developed to protect the features for which the area has been designated. During the development of the current Forest Land Resource Management Plan (LRMP), a number of sites within Tehama County were identified as eligible for SIA classification. Included were portions of Deer Creek containing approximately 14,108 acres of significant geologic features along with another 15 acres in the Black Rock area, which also contains a unique geologic feature.

Nationwide Rivers Inventory Listing

With the passage of the National Wild and Scenic Rivers Act of 1968 (WSRA), congress called for the identification of potential wild, scenic, and recreational rivers within the Unites States. To accomplish this task, the National Park Service developed and currently maintains the Nationwide Rivers Inventory Listing of potentially eligible river segments. A river segment may be listed on the NRI if it is free-flowing and has one or more “outstandingly remarkable values.” The kinds of significant values that can qualify a river for listing include: “exceptional scenery, fishing or boating, unusual geological formations, rare plant and animal life, and cultural or historical artifacts that are judged to be of more than local or regional significance.” The NRI is a source of information for statewide river assessments and federal agencies involved with stream-related projects. U.S. Forest Service mandates require the National Forest planning process to assess eligibility and suitability of those rivers listed on the nationwide inventory. The staff of individual Forests determines a river’s eligibility and suitability by applying criteria from the Act and the agency’s published implementing guidelines.

Based upon current WSRA eligibility criteria and Lassen National Forest guidelines, the following streams or some segment meet the criteria of candidacy for Wild and Scenic River classification:

North and South Forks of Antelope Creek

The Antelope Creek stream system flows southwest through mixed conifer forest, oak woodlands, chaparral, and grasslands before it enters the Sacramento River. Both forks cut through narrow secluded canyons lined with riparian vegetation. The area has cultural resource significance and is important habitat for the remnant runs of spring-run Chinook salmon and steelhead.

Mill Creek

Mill Creek flows southwest through meadows, dense forests, and a spectacular basaltic canyon, prior to its confluence with the Sacramento River. In addition, this stream is an important anadromous fishery and contains the highest elevation spawning areas for salmon in California. As part of Ishi's home territory, it also has high cultural significance.

Deer Creek

Deer Creek flows southwest through the Lassen National Forest into the Sacramento River It cuts through rugged forested mountains and deep canyons with important geologic formations. The canyon has nationwide cultural significance because it was part of the area inhabited by the Yahi Yana Indian tribe. Deer Creek also contains valuable spawning grounds for spring-run Chinook salmon and steelhead.

Roads

The Central–Cohasset Planning Unit is very remote and has only one paved road—Highway 32. The remainder of the transportation system within the unit consists of wildland roads under varying degrees of development and maintenance which are used for access to the area's timber lands, ranch lands, and wildland recreation areas.

Ponderosa Way

Ponderosa Way is a largely unpaved wildland road which spans eastern Tehama County. The largest portion of the route is within the Central–Cohasset Planning Unit although smaller portions are also located in the Battle Creek-Manton and Paynes

Creek-Highway 36 Corridor Planning Units. Much of the route is rough and rocky and is suitable only for off road vehicles. The road provides primary access to the communities of Ponderosa Sky Ranch and Panther Springs and is a secondary route to the Lyonsville-Lyman Springs area. It is also a primary access route to the Tehama State Wildlife Area and the Ishi Wilderness. Depending upon the particular segment, road management and maintenance is the responsibility of either the Tehama County Road Department or the Lassen National Forest. Additional road work is completed by Sierra Pacific Industries in connection with harvest or management activities on their adjacent lands. Generally, road maintenance is limited to yearly grading, occasional rocking, and hazard tree removal.

Tehama Wildlife Area Service and Access Roads

A number of very primitive routes have been established throughout the lands of the Tehama Wildlife Area. These routes are lightly used and can provide fairly extensive access to wildlife area lands as well as to lands within the Ishi Wilderness adjacent to the east.

Lassen National Forest Roads

Throughout the Lassen National Forest lands are an array of mostly unpaved roads. These are wildland roads used to access lands for fire fighting and resource projects.

Communities

Cohasset

Cohasset is a small, dispersed, ridge top community located about fifteen miles northeast of Chico along Cohasset Road. The community's elevation ranges from 1,900 to 3,600 feet. At the present time, the Cohasset wildland urban interface area contains a population of about 1,000 people. Community resources include a general store, mobile home park, an elementary school, volunteer fire station, and a seasonal facility operated by CalFire. A portion of the Cohasset urban area is located within this fire planning unit as are some scattered dwellings. As a result, the entire Cohasset urban area was in included in the fire plans analysis

Campbellville

This Wildland Urban interface area is located northeast of Cohasset on the unpaved Cohasset Ridge Road. Like the other relatively undeveloped communities in the Central–Cohasset Planning Unit, Campbellville contains a combination of permanent residents and numerous absentee owners.

Watersheds

Dye Creek

The Dye Creek watershed is located within the middle and lower elevations of the Central–Cohasset Planning Unit. This tributary to the Sacramento River drains a portion of Tehama County that is characterized by steep, dissected canyons separated by broad plateaus. The area consists largely of blue oak woodlands, volcanic buttes, rolling grasslands, and extensive riparian forests. These streamside forests widen as Dye Creek leaves its canyon mouth and flows westward through wetlands to the Sacramento River. More than 600 plant species are found on the Dye Creek Preserve. Approximately 80% of these plant species are native, and 14 species have been classified as rare. Many birds are found within the watershed's oak woodlands and riparian ecosystems, including neotropical migrants, raptors, cavity nesters and song birds. Mammals such as gray fox, black bear, and mountain lion utilize the environmental resources of Dye Creek between the foothills and the river. Like most of the other watersheds within the Tehama East CWPP project area, Dye Creek provides winter range for the regionally significant Tehama Deer Herd.

Ranching and wildlife management are the primary land management activities within the Dye Creek watershed. These operations are concentrated within various large public, private, and nonprofit organization land holdings. One of the watershed's major land holdings is Dye Creek Preserve, which is managed by The Nature Conservancy. The management goal of The Nature Conservancy is to maintain both working landscapes and the natural fire related ecosystems found within the Dye Creek watershed. Among the current management efforts being conducted on these lands is the use of prescribed wildland fire to reestablish natural fire frequency in order to impact the ecosystems found within the Dye Creek watershed. These impacts include control of invasive plants within foothill grassland and oak woodland habitats; altered age, size, and species structure of the watershed's chaparral and forest ecosystems and altered fire regimes across the watershed's entire landscape. In addition, these prescribed burning efforts are being conducted in order to control sometimes excessive fuel loads in an attempt to avoid catastrophic wildfire that have the potential to dramatically alter environmental conditions within the larger eastside area.

Mill Creek

The Mill Creek watershed is relatively long and narrow, with moderate to steep slopes. Extended, low gradient channel types are uncommon, and the steep slopes within the main stem and subwatersheds of Mill Creek have the potential to create high intensity

wildfires demonstrating extreme fire behavior within the riparian zone and upland areas. In addition, much of the watershed has rhyolitic soils where increased surface erosion rates are expected, especially on sites where vegetation has been removed by fire or other processes. Steep slopes adjacent to the main channels have served as a barrier to development activity, and recent land use allocations have protected these areas such that the main stem remains essentially undisturbed. Fire has helped to develop and sustain the natural forest, chaparral, and oak woodland and grassland communities of the Mill Creek watershed; however; this phenomenon has been largely removed as an ecosystem process within a significant portion of these landscapes.

Based upon information originally compiled by the California Native Plant Society as well that contained in the California Natural Diversity Database, twenty-one special status plants have the potential to occur within some portion of the Mill Creek watershed. One of these, the northern spleenwort, has been formally documented as a threatened plant species. Like Antelope Creek and Deer Creek, Mill Creek and its tributaries are unimpounded and as such have regional significance as fisheries habitat. Anadromous fish (spring- and fall-run Chinook and steelhead) have been able to maintain passage, and native fish communities have survived in this free flowing stream system, the likes of which have become rare in the foothills of the Sierra Nevada and Cascades ranges. The anadromous fish habitats found within Mill Creek are significant among those remaining in the Central Valley and serve as important anchors for their recovery. Herpetile species, which have declined precipitously throughout the state, are found in relative abundance within the Mill Creek watershed. These include Cascades and foothill yellow-legged frogs.

The varied geology and vegetation of the watershed also help to support a diverse array of wildlife habitats. Many of these species have regional significance, including those which have disappeared elsewhere, including peregrine falcons, bald eagles, California spotted owls, and willow flycatchers. Rangelands and cattle ranching within the lower portion of the watershed continue to support local and regional economies. Although development pressure for residential development has increased within certain portions of the watershed, the area remains relatively remote and undeveloped in those areas between the communities of Mill Creek and Childs Meadows adjacent to Highway 36E and the valley portion along State Route 99 E.

Significant among the assets found within the Mill Creek watershed are significant areas of riparian habitat. These shaded areas along stream channels maintain proper water temperature for anadromous species and act as a stream buffer critical in the protection of aquatic ecosystems resources from excessive sediments. As a result, water quality for native fish and other species throughout the entire watershed

is increased. The maintenance of healthy riparian habitat within Mill Creek and its larger watershed area is a major concern of stakeholders such as the Mill Creek Conservancy, The Nature Conservancy, the Lassen National Forest, and the U.S. Fish & Wildlife Service's Andromous Fish Restoration Program. To that end, an array of projects has been completed or is in process to protect and improve the Mill Creek watershed's riparian corridor. These efforts include an evaluation of historic and current vegetation along the lower reaches of Mill Creek in order to develop riparian habitat improvement projects which will moderate water temperatures, reduce erosion, and provide an overall increase in water quality. In addition, a water monitoring program was established in order to assess water quality conditions in terms of temperature, dissolved oxygen, pH, turbidity, minerals, nutrients, bed load sediment, macroinvertebrates, and other factors. More concrete measures taken to protect aquatic and streamside ecosystems consist of acquiring various riparian easements on important private lands along the lower watershed's streamcourse.

Toomes Creek

Toomes Creek is a small intermittent tributary to the Sacramento River which begins at the confluence of Acorn Hollow and Dry Creek approximately eight miles from its confluence with the Sacramento River. In addition to the fisheries habitat provided by the area's larger tributaries (Antelope Creek, Mill Creek and Deer Creek), nonnatal rearing of juvenile Chinook salmon (Oncorhynchus tshawytscha) has been documented at the mouth of Toomes Creek. Data gathered by faculty from California State University Chico suggests that juvenile Chinook rearing in the tributaries can provide habitat for rearing smolt. This data suggests that juvenile Chinook rearing in the tributaries grew faster and were heavier for their length than those rearing in the mainstem. Faster growing fish smolt may enter the delta earlier in the year, before low water and pumping degrade rearing habitat. Optimal rearing conditions in the tributaries exist from approximately December through March.

Deer Creek

Deer Creek is a significant eastside tributary to the Sacramento River. The watershed originates in the vicinity of Deer Creek Meadows and Butte Mountain. The total watershed drains 229 square miles or approximately 146,500 acres and is 60 miles long. That portion of the watershed within the Tehama East CWPP planning area starts at the point where Deer Creek crosses Ponderosa Way just upstream from its confluence with Rush Creek and ends at the stream's mouth at the Sacramento River. This portion of the watershed is characterized by extremely broken topography with

steep canyons. The surface geology is almost entirely volcanic and heterogeneous in erosion rates and soil productivity. Access to Deer Creek is limited to roads along the ridge tops such as Ponderosa Way, the Lassen Trail out of the Ishi Wilderness, PG&E power line access roads, and other primitive ranch roads. Within the lower portion of the watershed, fuels are relatively light, consisting of mature oak woodlands and grass that provide flashy fuels for fast moving wildfires. At higher elevation near the easternmost portion of the planning area, vegetation changes to chaparral species and scattered, mixed conifer forests. These vegetative communities result in heavier fuel loadings, which under certain conditions can burn almost as rapidly as the grassy fuels found at lower elevations. Deer Creek supports fall- and spring-run Chinook salmon and steelhead trout and is considered to have the greatest spring-run Chinook salmon restoration potential of all Sacramento Valley tributaries. Aspect strongly influences vegetation patterns. Southern exposures often have sparse vegetative cover due to high heat and moisture stress. As result of reduced cover, fluvial erosion rates are often higher than on more densely vegetated north-facing slopes.

Because of the northeast-southwest trend of the basin itself, slopes flanking the main channel canyon tend to have aspects perpendicular to that trend, namely northwest and southeast. Flatter areas such as valleys and plateaus are little influenced by aspect. In the upper watershed, no one aspect is dominant. In the canyon reach, northwest and southeast aspects are most frequently encountered, although all other aspects are well represented.

Urban development is extremely limited throughout the Deer Creek watershed. This is especially true within the Tehama East CWPP planning area where the Campbellville and Cohasset WUI's represent the only multiple-resident areas. Several important high power transmission limes traverse the Deer Creek Watershed as well. This utility infrastructure is protected by extensive vegetation clearing within the transmission right-of-way. These areas of fuel treatments help to protect the structures from wildfire, and they also reduce the chance of ignition from the transmission lines. In addition, during wildfire events, these cleared areas act as significant fuel breaks in the absence of an extensive developed road system. Roadless areas within the watershed include the Cub Creek subwatershed, Polk Springs, Butte Mountain, and a portion of the Ishi Wilderness. Just outside the planning area east of Ponderosa Way are extensive tracts of public and private forest lands. Being largely unpopulated and upslope from the Tehama East CWPP planning area, these forest lands are at considerable risk of wildfire starting in the more populated oak woodlands and grasslands to the west.

Recreation

Various primitive campgrounds are located within the Central–Cohasset Planning Unit. These include Black Oak Grove located just outside the northwestern boundary of the Ishi Wilderness; Little Bucks Flat, Black Rock Campground along Mill Creek; a small dispersed camping facility at the confluence of Cement Creek and Deer Creek, and the Polk Springs facility. Primary access to the watershed and these recreational sites is via Ponderosa Way (28N29) which traverses the eastern half of Tehama County from north to south connecting State Routes 36E and 32E. A number of undeveloped and primitive roads also provide northerly and southerly access to primitive campgrounds.

Sierra Pacific Industries

At the present time, Sierra Pacific Industries (SPI) owns and manages significant acreage within the planning unit along Ponderosa Way. The 1999 Gun II fire either damaged or destroyed a considerable amount of SPI timber growing within the Central–Cohasset Planning Unit area. In the aftermath of this event, regrowth of timber stands resulted in a number of overly stocked forestlands. At the present time, the company is in the process of clear cutting approximately 3,000 acres of regeneration in a swath eight miles long and between .5 to 1 mile wide near the rim of Mill Creek canyon. Approximately 103 acres of the SPI thinning project along Ponderosa Way is currently in process within the Central–Cohasset Planning Unit. These fire impacted stands are being replanted and managed as timber plantations over the next several years. The dense stands of young trees and brush that result from these reforestation efforts will be threatened by wildfire until a heavy thinning operation can occur in approximately eight years. As a result, SPI plantations constitute a significant asset at risk within the Central–Cohasset Planning Unit.

Dye Creek Preserve Prescribed Burns

Although prescribed fire reduces grass and brush fuels only in the short term, these efforts do represent a limited level of protection particularly within stands of heavy chaparral brush species. The following is a list of recent prescribed burn projects conducted within the Central–Cohasset Planning Unit on Dye Creek Preserve lands over the past year.

- Battalion 2 Parker Pastures CALFIRE VMP: 463 acres completed
- Battalion 2 Dye Creek Units SDC VMP: 17 acres completed
- Battalion 2 Neary Unit CALFIRE VMP: 318 acres completed

- Battalion 2 Wildcat North (Dye Creek Preserve) CalFire VMP: 660 acres completed
- Battalion 2 Andreini Pasture (Vina Plains Preserve) CalFire VMP: 465 acres completed

Historic Rock Walls

Throughout eastern Tehama County, historical rock walls have long provided substantial control points for both wildfire suppression and fuels management projects. These walls are found throughout Dye Creek Preserve grasslands and oak woodlands and continue to be of significant benefit to the fire and fuels management efforts conducted by The Nature Conservancy staff. Significant among these structures are the walls in the Long Gulch area as well as an extensive wall located parallel to Foothill Road.

Classification of Campbellville as a Wildland Urban interface Area

The Campbellville area of eastern Tehama County is located along Ponderosa Way a few miles south of its Deer Creek crossing and approximately 8 miles northeast of Cohasset. A number of recreational cabins and several permanent residents are located in the area. Lands managed by the Lassen National Forest and Bureau of Land Management are located nearby to the north, south and east of these structures. Grass and heavy brush within portions of the area create hazardous fuel conditions and the current level of development places numerous residents at risk. Based upon the Federal definition of Wildland Urban Interface as reported in the Federal Register of January 4, 2001, consideration should be given to pursuing the classification of Campbellville as a wildland urban interface area.

Deer Creek Fire Management Framework

This fire management planning initiative attempts to establish steps that will minimize economic and environmental losses resulting from catastrophic wildfires within the Deer Creek watershed and to identify pre-fire management projects to control and mitigate sedimentation and habit loss attributable to wildfire events. Among the plan's major recommendation are:

- Encourage landowners to utilize information developed through The Nature Conservancy's prescribed rangeland burning projects as well as the technical assistance and legal indemnification for such projects available through

participation in CAL FIRE's Vegetation Management Program.

- Installation of signs at road junctions in order to assist out-of-area firefighters in finding access to trails, particularly in the lower watershed, and promote the maintenance of such signage.
- Concentrate future fuels management efforts on creating defensible zones at the margins between the foothill grassland/chaparral and timbered areas and on the creation of more fire tolerant forest stands throughout the upper portions of the Deer Creek Watershed.
- Encourage low impact methods of fuel reduction such as forest thinning and under burning on public forestlands within the watershed, especially in those areas where relatively small projects could increase the effectiveness of private fuel reduction projects.
- Encourage Lassen National Forest to design fuels inventories and area treatments for nonroadbed areas within the upper Deer Creek watershed.
- Promote CALFIRE coordination of GIS databases containing existing fuel break projects and forest conditions within State Responsibility Areas.

Priorities and Summary of Proposed Projects

The significant resources found within the Central–Cohasset Planning Unit consist of:

- Small rural communities (Campbellville and Cohasset)
- Sensitive, threatened, and endangered plant and animal species along with their critical habitat, particularly the vernal pool species found within the Vina Plains area
- Lands used for commercial purposes, such as range lands and timber lands
- Vast watershed areas containing an array of important environmental values such as:
    - Water quality and quantity
    - Riparian habitats along major stream courses
    - Properly functioning aquatic ecosystems
- Unique landscapes, including:
    - Tehama County Wildlife Area
    - Ishi Wilderness Area
    - Black Rock Campground

    - Devils Parade Ground
    - Dye Creek Preserve
    - Vina Plains Preserve
    - Deer Creek Area of Critical Environmental Concern
    - Burroughs Pinery
    - Beaver Creek
- Ponderosa Way
- Streams of nationwide significance whose resources warrant consideration for inclusion into the Nationwide Rivers Inventory Listing, i.e., portions of Mill Creek and Deer Creek
- Important anadromous fisheries along Mill Creek and Deer Creek, and their tributaries
- Potential and current non-natal rearing habitat for juvenile Chinook salmon found at the mouths of tributaries of the Sacramento, including Dye Creek, Pine Creek, and Toomes Creek
- Cultural and historical artifacts, including
    - Historical rock walls
    - Significant sites of human occupation

Introduction

In prioritizing project recommendations, the protection of residents and firefighters was of primary importance, as well as the protection of public and private property. In recognition of the landscape scale interconnectedness of watershed components, those projects which provided landscape scale protection of plants, animals, and other watershed resources found within the Central–Cohasset Planning Unit were next in importance. Finally, those efforts that protected permanent cultural features were given consideration. The following description and discussion of projects that would protect the resources within the Central–Cohasset Planning Unit have been prioritized based upon the values placed on the primary resource these projects would protect.

Cold Springs Underburn 2006-2007 Phase

During 2004 and 2005, about 80 acres of pine/oak woodlands and mixed confer stands were treated in the Cold Springs area of Lassen National Forest lying just east of Ponderosa Way. Project work entailed hand thinning, piling, and burning of woody debris in preparation for a larger shaded fuel break project to be completed in 2007 or 2008. A 265-acre prescribed fire project is planned

for the Cold Springs area. The 2006-2007 phase of project work continues earlier efforts to underburn within pine stands, oak woodlands, and mixed conifer forests in order to create a shaded fuel break which will tie in with a similarly developed fuel break completed by Sierra Pacific Industries. *(Refer to #1 on Figure X-2 at the end of this section.)*

Public and Private Collaborative Improvements Along and Adjacent to Ponderosa Way

Lassen National Forest, Sierra Pacific Industries, and Collins Pine Company have identified a number of biomass thinning operations that could be conducted along ridgetop roads in the area between Barkley Mountain and The Narrows just south of McCarthy Point. In addition, similar thinning work could be conducted along the upper slopes of Dead Horse Creek. This proposed project includes a possible extension of thinning work along Ponderosa Way toward Mill Creek. If completed, this latter project would add a four mile long linear protection feature. *(Refer to #2 on Figure X-3 at the end of this section.)*

Power Line Access Improvements within the Dye Creek Preserve

At the present time, power line access roads within the upper reaches of the Dye Creek Preserve are discontinuous, poorly maintained, and bisected by many stringers of live oak and other vegetation. A 2002 mastication project under power lines generated considerable dead fuel which could generate high fire intensities when wildfire occurs. In addition, steep areas near canyon bottoms have not been cleared of either live or dead fuels. As a result, these utility access roads cannot be safely or effectively used for prescribed burning operations. In order to correct this situation, fuels reduction projects need to be undertaken that improve the ability of fire equipment to rapidly travel these electrical utility roads, that reduce previously generated dead fuels, and that remove both live and dead fuels in canyon bottoms. *(Refer to Figure X-4 at the end of this section.)*

The Nature Conservancy /Dye Creek Preserve Fire Ecology Projects

As is the case with much of the fire management work conducted within the Central–Cohasset Planning Unit, fire planning efforts on lands managed by The Nature Conservancy ("TNC") focus on ecological restoration and on land management practices that promote and sustain the natural fire ecology of the area. Few structures or developed features are found within TNC managed lands. As a result, with the exception of firefighter safety, the fire hazard to lives and property are not as signifi-

cant on TNC lands as in areas near "at risk" communities and areas of Wildland Urban Interface. Throughout the Dye Creek Preserve, fire management has been identified as a key strategy and tool for managing an array of ecological threats to the grasslands and oak woodlands of the area. The use of prescribed burns has also been determined to be an important means of maintaining the environmental health of these lands, once current threats have been minimized. Through the use of managed fire, TNC is attempting to alter the age and size structure of vegetation within the area's chaparral and low elevation forests, as well as to alter the fire regimes throughout the preserve. In addition, through the use of carefully developed burning prescriptions, TNC is attempting to control invasive plant species which threaten native plant and animal communities found within this portion of Tehama County.

To accomplish its environmental goals, TNC employees have developed a yearly program of prescribed burning to enhance the resources on conservation lands under TNC management rather than to simply reduce the threat of wildlife within the Wildland Urban Interface. During the 2007 burning season, TNC staff treated 662 acres of chaparral and grassland fuels in the Wildcat North Unit and another 470 acres in the Andreini Pasture Unit. Between 2008 and 2010, TNC staff in partnership with CalFire plan to treat 1073 acres of chaparral and grassland fuels in the Upper Parker Unit on Dye Creek Preserve and another 2231 acres of grassland in the Brown, Foor and Rowles Units on Vina Plains Preserve, representing treatment of approximately 1100 acres of TNC land annually. This project work will be planned, funded, and administered through the CalFire vegetation Management Program. At the present time it is expected that roughly 2,000 acres of grasslands, oak woodlands, and chaparral lands will be burned per year, focused on these areas:

Ridgetop Fuel Breaks Between Grass/Chaparral Lands and Timbered Areas

The Deer Creek Fire Management Framework mentions that fires within the lower portions of the Deer Creek watershed spread quickly through annual grasses. In these grasslands, fuel breaks and other fuels reduction projects are of limited effectiveness in controlling fire spread, and air resources are often directed to those areas that have greater population densities, thus exacerbating the rate of fire spread. It is recommended that the Deer Creek Watershed Conservancy in connection with the Tehama-Glenn Fire Safe Council and Sierra Pacific Industries collaborate on the development and funding of fuel breaks and other fuels reduction efforts in areas outside of the Ponderosa Way road prism as a way to reduce the threat of wildfire on valuable timberlands.

Coordination of Vegetation Management Efforts Within the Tehama Wildlife Area

On occasion, prescribed burns and other vegetation management projects are conducted throughout the Tehama Wildlife Area managed by California Department of Fish and Game. While these projects are developed with wildlife habitat improvement in mind, if properly conducted, these projects can also be used to reduce fuels in strategic areas. It is recommended that Department of Fish and Game personnel managing these lands and developing improvement projects coordinate with CAL FIRE, the Tehama-Glenn Fire Safe Council, and the Lassen National Forest in order to develop multi-resource improvement projects throughout these state lands.

Improvements to Existing Ponds and Lakes

Throughout the Central–Cohasset Planning Unit, a number of ponds and small natural lakes would provide water during fire emergencies. If properly developed with pumping facilities and storage tanks, the time it takes to fill tankers and other firefighting equipment could be dramatically reduced. As a result of improvements, these existing water sources could provide one of the most significant firefighting infrastructures within this portion of the Tehama East Community Wildfire Protection Plan project area.

Installation of Water Tanks with High Volume Fill Spout Fittings Throughout the Central–Cohasset Planning Unit

Given the remoteness of the area and lack of roads, a large percentage of the fires occurring within the Central–Cohasset Planning Unit are accessed by air utilizing the CalFire helitack crew located near Vina. In addition, water tanks located in very remote locations face a significant risk of vandalism which could render them useless in the event of a fire emergency. Considering these limitations, sites suitable for the installation of water tanks were identified by members of the Tehama-Glenn Fire Safe Council, Lassen National Forest, CAL FIRE, The Nature Conservancy, and the Tehama County Resource Conservation District.

Installation of a 10,000 Gallon Water Tank

Installation of a 10,000 gallon water tank was recommended at the ranch facilities at the Dye Creek Preserve headquarters*(Refer to #3 on Figure X-5 at the end of this section.)*

XI. Area Description and Overview
Sacramento River Corridor Planning Unit

The Sacramento River Corridor Planning Unit has the highest population concentration of the entire Tehama East CWPP project area. This unit includes the riparian corridor of the Sacramento River along with immediately adjacent farm lands between the river and Highway 99E *(See Figure XI-1 at the end of this section)*. The corridor also includes the mouths of those major streams included in this fire plan's area of analysis.

Major Land Management Areas and Assets at Risk

California Department of Fish and Game
Sacramento River Wildlife Area

The Sacramento River Wildlife Area is composed of a series of separate properties that extend from one mile north of the Colusa to approximately three miles south of Woodson Bridge in Tehama County. Approximately 473 acres of the wildlife area are located within the Tehama East CWPP project area. These lands consist of dense riparian forest, grasslands, riparian scrub, an oxbow lake, and a large gravel bar and for the most part are only accessible from the river.

United Sates Fish and Wildlife Service,
Sacramento River National Wildlife Refuge

The federally managed Sacramento River National Wildlife Refuge consists of 27 properties located along 77 miles of the Sacramento River within Tehama and Glenn Counties. These riparian habitats include wetlands, uplands, and a number of agricultural parcels that are managed in such a manner as to incorporate the resource goals of the refuge. The primary objective of the refuge is to protect and improve riparian and aquatic habitat located on lands managed by the U.S. Fish & Wildlife Service along the Sacramento River. Significant among the species of concern are four runs of Chinook salmon along with an array of migratory birds, songbirds, and water associated animals, including the river otter, turtles, beaver, American pelicans, ospreys, and bank swallows.

A program of fire and fuels management has been developed for all the parcels within the wildlife refuge and are incorporated into the "Wildland Fire Management Plan for the Sacramento River National Wildlife Refuge." In addition to the Sacra-

mento River Wildlife Area, the Wildland Fire Management Plan addresses fire and fuels issues related to the Coleman National Fish Hatchery and the U.S. Fish & Wildlife Service Red Bluff Field office that are described below. Overall, the projects and other efforts developed in the fire management plan are intended to maintain current fire protection and fuels reduction efforts. It also reports the results of future fire planning needs assessment. Importantly, the initiatives developed in the USFWS fire plan are intended to supplement, clarify, and direct USFWS efforts related to fire management utilizing stakeholder input developed through the Community Wildfire Protection Plan process. Through this process, it is expected that the organizational goals and agenda of the USFWS can be better meshed with those of other public and private stakeholders within the county. Such collaborations are expected to result in superior projects that address numerous fire and resource issues as well as the needs of Tehama County's rural communities. The projects developed by USFWS personnel focus on reducing hazardous fuels (particularly in the wildland urban interface), reducing nonnative vegetation, and managing and improving riparian habitat. These projects follow minimum impact strategies in order to reduce impacts to sensitive plants, fish, and wildlife.

Coleman National Fish Hatchery

The Coleman National Fish Hatchery was established in 1942 and is located along the border between Tehama County and Shasta County. The facility was constructed on a relatively flat parcel along the north bank of Battle Creek approximately five miles northeast of the Sacramento River and the mouth of Battle Creek. The facility contains an array of building and fish production facilities where 12,000,000 Fall-run Chinook salmon; 1,200,000 Late Fall-run Chinook salmon; 1,500,000 Winter-run Chinook salmon; and 600,000 Steelhead trout are produced annually. The operation is surrounded by a combination of grasslands, oak woodlands, and riparian habitat.

Sacramento River—Bend Area of Critical Environmental Concern

The Sacramento River-Bend Area of Critical Environmental Concern is located within north central Tehama County about ten miles northeast of Red Bluff between the Sacramento River and Highway 36E. This Bureau of Land Management unit contains approximately 40,000 acres of public and private grasslands, vernal pools, wetlands, and oak woodlands. At the present time, BLM continues to consolidate adjacent federal holdings, thus expanding the size of this ACEC unit. The goal of these acquisitions is to preserve important environmental features, as well as to increase the efficiency and effectiveness of landscape scale management practices. Significant

among the current array of land management efforts is the use of prescribed fire and mechanical vegetation reduction to reduce fire hazards.

In addition to reducing the potential for resource destruction through catastrophic wildfire, vegetation management project work has also been found to have a direct positive impact on habitat conditions, such as the control of invasive species. Other significant resources found within the Sacramento River ACEC include the last remaining riparian systems of any significant size along the Sacramento River between Red Bluff and Shasta Dam. The Sacramento River and the confluences of Battle Creek, Paynes Creek, Inks Creek, Dye Creek, and Toomes Creek all provide extensive aquatic and riparian habitat within this planning unit. In addition, upland areas along the Sacramento River contain significant raptor habitat, a portion of the Tehama Deer Herd's winter range, and archeological resources.

Battle Creek Wildlife Area

The 582-acre Battle Creek Wildlife Area managed by the California Department of Fish and Game lies just south of the Coleman Fish Hatchery along the lower main stem and mouth of Battle Creek. These lands provide important spawning grounds for Chinook salmon. They also contain riparian forests, marshes, and oak woodlands, all of which provide habitat for bald eagles and osprey. Primary access to the wildlife area is via Coleman Fish Hatchery Road. A portion of the facility can be accessed from the east using primitive ranch roads.

Roads

Highway 99E

Highway 99E is the major transportation route through the Sacramento River Corridor Planning Unit. This state highway connects the communities of Red Bluff, Dairyville and Los Molinos with Chico just south of the planning unit. Like other state highways within the Tehama East CWPP area, Highway 99E acts as a significant fuel break for wildfires especially those moving in an east-west direction. Also like other highways in the area, this route also provided a considerable source of potential ignition throughout the planning unit.

Communities

Bend

The Bend area is a dispersed unincorporated community located along the Sacramento River approximately five miles east of Interstate 5. The majority of the area's population consists of full time residents. The overall urban area contains an

elementary school, a commercial establishment, and a post office. Various agricultural operations are located within the surrounding area. The closest fire service is located at the CalFire Tehama -Glenn Unit Headquarters facility in Red Bluff roughly ten miles to the southeast. Bend has been formally identified as a federal at risk community.

Red Bluff

As of 2006, Red Bluff had a population of 14,000 residents. The community is formally classified as a federal at risk community. Fire protection within the Red Bluff urban area and on surrounding lands is provided by the Red Bluff Fire Department, the Tehama County Fire Department, and CAL FIRE.

Dairyville

Dairyville is a small community along Highway 99 E roughly eight miles south of Red Bluff. The urban area is surrounded by orchards and field crops. The community contains several commercial establishments and a post office. Lassen View School is located a few miles south of the Dairyville urban core. The closest fire service is located at the CalFire Tehama -Glenn Unit Headquarters facility in Red Bluff eight miles to the south. The Dairyville urban area has been formally identified as a federal at risk community.

Los Molinos

Los Molinos is located along Highway 99E thirteen miles south of Red Bluff. This unincorporated community has a population of about 1,950. The urban area has an array of commercial and small industrial establishments as well as a post office located along the Highway 99E corridor. A county fire station is located several blocks east of the highway. The community also has an elementary school, middle school, and high school in the immediate urban area. Farmlands and orchards surround Los Molinos to the north, south, and west. Dry land farms and ranchlands are found to the east, and these are considered to pose the greatest wildfire threat in terms of fire spread.

Watersheds

No significant watersheds originate entirely within the Sacramento River Corridor Planning Unit. However, numerous significant and minor tributaries of the Sacramento River have their stream months in this area. These intersecting streams include Inks Creek, Paynes Creek, Salt Creek, Antelope Creek, Dye Creek, Mill Creek, Toomes Creek, Deer Creek, and Pine Creek. As mentioned earlier, the confluences of

several streams are considered to be significant rearing areas for non-natal anadromous species and as a result play a significant role in maintaining the fisheries within the Sacramento River watershed system.

Current Fire Protection Infrastructure

Bend Boundary

This Wildland Urban Interface project entails low intensity burning of grass and light brush ground fuels within 120 acres of blue oak woodlands managed by the Bureau of Land Management within the Bend District. The project area is adjacent to a subdivision and other urban developments; as a result, the project is of particular interest to BLM as a priority project under the National Fire Plan. In addition to fire hazard reduction, the project is expected to yield pond and watershed improvement benefits. In 2005, the Bureau of Land Management conducted hazard reduction burns with the objective of reducing fuel loading and fire hazards within the Bend Area of Critical Environmental Concern. These burns were conducted in cooperation with CAL FIRE.

Priorities and Summary of Proposed Projects

The significant resources found within the Sacramento River Corridor Planning Unit consist of:

- Various small rural communities:
  - Bend
  - Red Bluff
  - Dairyville
  - Los Molinos
  - Vina
- Lands used for commercial purposes such as farming, ranching and timber managment
- Vast watershed areas containing an array of important environmental values such as:
  - Sensitive, threatened, and endangered plant and animal species along with their critical habitat, particularly vernal pool species found within the BLM Bend ACEC area adjacent to the Sacramento River
  - Water quality and quantity
  - Riparian habitats along major watercourses

    - Properly functioning aquatic ecosystems, including the non-natal rearing habitats found at numerous stream mouths along the Sacramento River
- Areas of cultural and historical significance, including significant sites of human occupation

Introduction

In terms of ranking priority projects, the protection of lives and private property was of paramount importance. The recognition that landscape scale interconnectedness of watershed components resulted in those projects which provided landscape scale protection to plants, animals and other watershed resources second in importance. Finally, projects that protected permanent cultural features in the area were given consideration. The following descriptions and discussion of projects to protect the resources within the Sacramento River Corridor Fire Planning Unit have been prioritized based upon the values placed on the primary resource these projects would protect.

The Sacramento River Corridor Planning Unit includes that portion of the Sacramento River's floodplain located within Tehama County. The area contains both public and private lands. Major land management entities and other stakeholders in the planning area include the U.S. Fish & Wildlife Service, California Department of Fish and Game, The Nature Conservancy, Bureau of Land Management, and California Department of Parks and Recreation.

The lands found within this planning unit are located along a portion of the river that is outside the Sacramento River Flood Control Project area and thus has no levee control. With the exception of Red Bluff, Tehama, Los Molinos, and Vina, the majority of the Sacramento River Corridor Planning Unit is rural in nature, having a low population and low housing density. In addition to a riparian corridor located immediately adjacent to the Sacramento River, the planning unit contains agricultural lands such as orchards, croplands, and a small amount of irrigated grazing land. Since the majority of the planning area's agricultural lands are irrigated, they pose a minimal risk from wildfire during the dry summer period. Wildfire is, however, a threat to the unit's wildland areas adjacent to the Sacramento River. The topography of the undeveloped portions of the riparian corridor is generally characterized by high and low terraces, an array of oxbow lakes, and sparsely vegetated gravel bars that are often only accessible by boat. Vegetation consists of dense riparian forests, upland grasslands, riparian shrub lands, wetlands, seasonal marshes, and vernal pools.

The typical high fire danger period within the planning unit is between May and early November as confirmed by information developed by CAL FIRE. Most of the fires occurring on these lands are reported to last no longer than one burning period (suppression before sunup or sundown). Fire causes are generally roadside ignitions, adjacent levee burning, power line, railway, and adjacent agricultural burning. Fire history within the area indicates that large and damaging fires can occur almost anywhere within the planning unit. This includes large, one-day fires in grass fuels; large fires (over 200 acres) in the foothills, which can be difficult to contain; and valley grassland fires, which can carry rapidly spreading, wind-driven fires with low to moderate resistance to control once attacked.

Results

Given the relatively limited amount of stakeholder interest and participation in the Sacramento River Corridor Planning process, community input was focused on government land management entities and watershed conservancies. This participation consisted of agency (U.S. Fish & Wildlife Service and the California Department of Fish and Game) membership and input into the core work group's efforts, input from members of the Tehama-Glenn Fire Safe Council, and focused outreach to various landowners, watershed representatives, and land managers regarding technical or location specific issues. The results of these efforts are summarized in this section. Also presented in this section are assets at risk located within the planning unit, in-place fire protection infrastructure, and proposed efforts to improve the protection of local at risk assets. Additional recommendations for fire safe activities are discussed.

United States Fish & Wildlife Service

The presence of the U.S. Fish & Wildlife Service (USFWS) within the Sacramento River Corridor Planning Unit includes that portion of the Sacramento National Wildlife Refuge Complex (Sacramento NWRC) located within Tehama County and the Red Bluff Field Office (Red Bluff FO), which oversees management of the Coleman National Fish Hatchery Complex (Coleman NFHC). The Sacramento River NWRC was established in 1989 under the Endangered Species Act and Emergency Wetlands Resources Act with the purpose of preserving, restoring, and enhancing riparian habitat for threatened and endangered species, neotropical and migratory birds, waterfowl, anadromous fish, resident wildlife, and plants. The Coleman NFHC and the Red Bluff FO were established in part, to facilitate the restoration of Pacific salmonids by providing mitigation, biological expertise, leadership, and assistance to partners protecting and enhancing ecosystems of the northern Central Valley. The Sacramento

NWRC was established under Executive Order No. 75 62 and the Emergency Conservation Act of 1933 to alleviate crop depredation and to provide wintering habitat for waterfowl. Fire management goals on all USFWS properties include the protection of life and property, reduction of hazardous fuels and non-native plants, and restoration of native habitats for fish and wildlife.

Assets at Risk from Wildfire

Refuge and hatchery properties include a range of assets at risk from wildfire. Many refuge properties include threatened, endangered, and sensitive species which could be affected by unplanned and catastrophic wildfires, including those that start on adjacent public and private lands. These USFWS properties support neotropical migratory land birds and diverse flora and fauna, in addition to providing feeding and resting habitat for migrating and wintering waterfowl and other water birds. These sites also provide opportunities for public education and research related to wildlife ecology and human impacts on riparian environments. Various structures, facilities, high value fish and wildlife habitats, and cultural resources occur on these properties. Wildland urban interface issues on local USFWS lands are most prevalent in the vicinity of the Coleman NFHC and in scattered locations adjacent to the Sacramento River NWR. Adjacent to these properties are orchards, pastures, agricultural crops, private duck-hunting clubs (seasonal wetlands), and low density housing that are also at risk of wildfire. The Coleman NFHC has additional issues with recreational use and target shooting on adjacent lands. In addition, these areas have increased ignition probabilities attributable to urban interface development and have a high potential for public trespass.

In-Place Fire Protection Infrastructure and Proposed Efforts to Improve the Protection of Local At-Risk Assets

The USFWS has established a funding priority for fire and fuels management projects within Wildland Urban Interface areas which emphasizes those assets and values at risk that are identified collaboratively within a Community Wildfire Protection Plan. In some cases, habitat management goals would create and/or maintain vegetation (fuels) in a Fire Regime Condition Class II or III. Some of these habitats have been significantly altered from historic conditions, but the ecosystem is not at risk of collapse and may be managed with fire at a more frequent rate than would naturally occur. In areas being managed for native upland habitat, the presence of nonnative invasive plants such as yellow starthistle and medusa-head grass is a significant issue and has altered the fire regime/condition class.

USFWS Planning Policy

The Department of Interior (DOI) fire management policy requires that all burnable acres on USFWS lands have a Fire Management Plan (FMP) which details fire management guidelines for operational procedures and values to be protected and or enhanced. FMP's are tiered from larger programmatic-level resource management plans such as a refuge Comprehensive Conservation Plan (CCP) and associated Habitat Management Plan (HMP). Current FMP's within the Tehama-Glenn Fire Safe Council area of interest include the 2001 Coleman NFHC FMP (updating in 2006), the 2001 Red Bluff FO FMP, and the 2001 Sacramento NWRC FMP. These FMP's are designed to assist in the protection of individual site facilities, resources, employees, and adjacent communities at risk to wildfire.

Fire management programs are coordinated by the Zone fire management team and various resource staffs, although final management decisions are made by site or complex managers. Fire project planning and implementation are directly supervised by the Zone Fire Management Officer. The Sacramento Fire Zone maintains a fire staff consisting of a Fire Management Officer, Wildland Urban Interface Coordinator, Fire Operations Supervisor, Engine Captain and crew.

Planning strategies and objectives are considered in the preparation of the Zone's Annual Work Plan and development of annual budget requests. Proposed actions, alternatives, and environmental analyses in compliance with the NEPA will be developed from annual strategies and will be used in the development of site-specific projects occurring on FWS properties. Annual work plans/project lists will be provided to the applicable CWPP representatives (CALFIRE Tehama-Glenn Unit Pre-Fire Engineer and TGFSC Coordinator) and other interested parties for review, prioritization, and amendment/adoption into the applicable CWPP(s).

Proposed WUI Projects

The USFWS North Central Valley Fire Management Zone submitted a proposed 2007 Wildland Urban Interface project, along with CWPP support information, to the Tehama-Glenn Fire Safe Council for review, comment, and adoption. This information was then forwarded to the Tehama County Resource Conservation District for incorporation into the Tehama East Community Wildfire Protection Plan. Initially, project proposals are general and aim for maintenance and projected project needs (out-year planning). Treatment areas have primarily been outlined within Fire Management Plans, Habitat Management Plans, and Comprehensive Conservation Plans, which provide the overlying management objectives. USFWS Wildland Urban Interface project areas/treatments may also be identified through CWPP efforts.

Collaborative Wildland Urban Interface treatments identified within a CWPP will receive priority funding.

The majority of USFWS Wildland Urban Interface treatments are focused at reducing nonnative vegetation and hazardous fuels as well as managing habitat. Mechanical fuel treatments may include hand thinning, chipping, mowing, disking, and grazing. Prescribed fire and grazing are often the preferred management tools (depending on habitat type), as they provide many habitat benefits as well as hazardous fuels reduction. The majority of prescribed fire activities on USFWS lands follow minimum impact strategies so as to reduce impacts to sensitive/protected plants, fish, and wildlife. The following are proposed fiscal year 2007 Wildland Urban Interface projects within the Tehama-Glenn CWPP unit area.

- 07-SAC-CNFH Piles—Proposed two acres of thinning around structures and pile burning at Coleman NFHC for approximately $5,560
- 07-SAC-Sacramento Rx—Proposed 287 acres of prescribed burning at the Sacramento NWRC for hazardous fuels reduction and habitat management for approximately $48,480
- 07-SAC-Sac Cmplx- CCC Project—Proposed 30 acres of mechanical work on USFWS and private lands in the WUI for approximately $31,000
- 07-SAC Cmplx- Tribal & CSUC Fuel Reduction Projects—Proposed 50 acres of fuels reduction, vegetation management, and research (treatment options for native plant and cultural resource management) on USFWS and private lands for approximately $50,000
- 07-SAC-Cmplx-RFD Partnership Defensible Space Projects—Proposed 30 acres of mechanical treatments on USFWS and private lands in the WUI for approximately $30,000
- 07-SAC-Sac River Rx—Proposed 79 acres of prescribed burning on the Sacramento NWRC for hazardous fuels reduction and for fish and wildlife habitat management for approximately $13,720
- 07-SAC-Sac River WUI—Proposed 2,248 acres of mechanical fuel break maintenance (mowing, disking, and thinning) and grazing for approximately $99,500
- O70SAC-RBFO-RX—Proposed 21 acres of prescribed burning around properties adjacent to roads, railroad, and facilities to reduce hazardous fuels for approximately $6,740

Partner and community support for USFWS fire management projects enhances funding and implementation options for USFWS and project collaborators. Federal WUI funding is prioritized by several factors, with emphasis on collaboration. Both grant funding and agency project funding are enhanced as partnerships, and support, are levied.

Zone WUI Program Objectives

Within the WUI, fuels reduction projects will be designed to mitigate the risks to people, their communities, and adjacent resource values important to the social/ economic stability of those communities from unwanted wildland fire. Although community protection is a WUI priority, USFWS has a general conservation mission and when and where possible will incorporate habitat objects into WUI projects.

To be effective in mitigating risks, in many cases projects cross over jurisdictional boundaries and address landscape level management strategies. USFWS-funded WUI projects emphasize the following criteria:

1. Be focused on communities at risk (CAR). In California, the CAR list is maintained by the California Fire Alliance and A process is in place for communities to be added or removed from that list. If the adjacent community meets the criteria of "at-risk" and is not identified on the CAR list, guidance and information will be offered to community organizations (fire safe councils, fire departments, city council, etc.) on the potential benefits of this listing status, and these community organizations will be directed to the CAR application.
2. Be adjacent or in close proximity to USFWS lands where there is risk of fire originating on those lands and threatening life and community values. Additionally, other lands will be managed under the direction or guidance of USFWS to incorporate fire management and hazardous fuels reduction within the WUI. These projects may include conservation easement lands and recovery implementation projects providing the mutual benefit of species recovery and fuels reduction.
3. Be identified or referenced within a CWPP which has or will be coordinated with the USFWS or is identified under a collaborative agency hazard mitigation plan which meets the intent of or is equivalent to a CWPP when all partners are not available.
4. Be designed to meet the objectives outlined in a CWPP (or other collaborative plan) and consistent with USFWS policy and management directives. Priority objectives include (a) firefighter and public safety, protection of

community values (including primary living and business structures, escape routes, watershed and ecosystem functions); (b) utilization of mechanical treatments which emphasize projects yielding biomass for off-site economic use (see guidance in the Apr 2004 DOI IM "Implementation of the Policy and Principles of Woody Biomass Utilization"); (c) partnerships providing matching or in-kind services demonstrating commitment to project objectives; (d) utilization of local contractors in support of rural community stability; and (e) provision of the mutual benefits of hazardous fuels reduction and ecosystem enhancement.

Zone CWPP Objectives

Education and outreach with interagency and local WUI partners will be the key to integration of USFWS fire management activities in a CWPP. Refuge CCPs, HMPs, and FMPs may need to be presented and/or interpreted to WUI partners in order to provide the information necessary for cooperative fire management efforts. Managers will review refuge documents to determine if WUI program objectives are clearly outlined and linked between plans. Many CCPs and HMPs may only identify fire as a habitat management tool and may not identify WUI program objectives.

Under a CWPP, community values and objectives will be defined through a collaborative process. An attempt will be made to address and incorporate refuge habitat management objectives into a CWPP when considering USFWS-related WUI projects. Refuge FMPs will identify CWPP objectives, treatment areas and projects when and where applicable. The March 2003 Information Memorandum (IM) Service Fire Management Policy Clarification states that USFWS fire management policy and implementation guidance shall apply to all USFWS fire management activities regardless of land ownership. USFWS projects defined in a refuge FMP and CWPP or with the treatment area and treatment type identified in a CWPP will receive priority WUI funding.

Where appropriate, a CWPP can be incorporated into a county plan or Disaster Mitigation Act/Multi-Hazard Mitigation Plan to help meet multiple planning and policy requirements. Project prioritization at a larger scale makes agency-funding strategies more effective while addressing local needs. The complexity of a CWPP will be dependent on local needs and opportunities, however the USFWS may be more strategic at coordinating at the county or watershed level or through integration with CalFire unit plans.

USFWS fire management directives state that a FMP will be reviewed and/or revised at a minimum of five year intervals or when a significant change in program

management is proposed or land use changes occur adjacent to FWS lands. When a FMP is ready for revision or amendment, CWPP objectives and treatments will be incorporated into the plan, if and when applicable.

XII. Summary and Conclusions

Analysis and Findings

In establishing priorities for fire and fuels management projects to be completed within eastern Tehama County, the lives of area stakeholders and fire fighters as well as public and private property were first and foremost in consideration. Those projects that provided immediate and direct impact on the threat and intensity of wildfire were given the highest priority. Among these critically important projects were those that entailed fuels reduction and infrastructure improvements, particularly those involving access for fire fighting forces and egress of residents. In addition, water storage and water delivery projects were considered of equal importance. Projects of somewhat less urgency were those involving regulatory matters such as changes in laws, ordinances, and codes that related to fire safety and fire management. Projects considered important but not urgent were initiatives to formally classify a number of small communities as officially recognized communities at risk as well as the development of Wildland Urban Interface areas. Finally, planning initiatives were considered to be the least time critical. From this prioritization process, the following broad action items were developed by the Tehama County Resource Conservation District with extensive input from the project's work group, the Tehama–Glenn Fire Safe Council, area stakeholders, and the Tehama County Resource Conservation District:

- Tehama-Glenn Fire Safe Council should develop a list of all currently unfunded fire and fuels management projects.
- Tehama-Glenn Fire Safe Council with assistance from the Tehama County Resource Conservation District, Tehama County Resource Advisory Committee, and Manton Fire Safe Council should identify possible sources of public and private funding for unfunded projects. Funding is expected to be in the form of public and private grants, self funding through the sale of biomass product, the assessment of fees, taxes, or other revenue sources. Proceeds from such funding could be used to finance both the initial completion of project work as well as the permanent maintenance of already completed infrastructure improvements.
- Tehama–Glenn Fire Safe Council in conjunction with CalFire and county regulatory agencies should establish a work group to review those local ordinances that impact fire safety and development within the fire prone areas throughout Tehama County.

- The efforts of the Tehama–Glenn Fire Safe Council; the United States Forest Service, and Bureau of Land Management personnel should be coordinated in order to create additional Wildland Urban Interface areas.

Plan Update Process

The overall goal of fire and fuels management for Tehama County is to develop countywide coordination of fire management related projects and policies. With the completion of the Tehama East and Tehama West Community Wildfire Protection Plans, the documents, maps, and recommendations generated through the planning process will be incorporated either by reference or directly into the CalFire Tehama –Glenn Unit Fire Plan which is updated annually. On a yearly basis, the coordinator of the Tehama–Glenn Fire Safe Council will work with the CalFire Tehama –Glenn Unit Pre-Fire Engineer to update the unit fire plan document's list of projects as well as identify newly developed projects throughout Tehama County. This project information will also be used to update the TCRCD's on line map and database of fire and fuels managment projects. Members of the Tehama–Glenn Fire Safe Council will be canvassed for input regarding changes to federal, state, and local policies, laws, and ordnances pertaining to fire safety, fire management, and fuels reduction projects.

Next Steps

In order to efficiently and effectively initiate the efforts described in this planning document, the Coordinator of the Tehama–Glenn Fire Safe Council will immediately begin to work with the members of the Tehama–Glenn Fire Safe Council to identify unfunded project work within eastern Tehama County. The Coordinator will also discuss with the Tehama County Resource Conservation District the possibility of their assistance in identifying funding sources for project work, developing project funding proposals, and providing financial management of project work. Finally, the Tehama–Glenn Fire Safe Council Coordinator will work with the CalFire Tehama –Glenn Unit Pre-Fire Engineer and the Tehama–Glenn Fire Safe Council members in order to establish a process to officially incorporate the Tehama East and Tehama West Community Wildfire Protection Plans into the Tehama–Glenn Unit fire plan. CalFire unit staff will then establish formal procedures to update project work as well as stakeholder policies related to fire and fuels management. This effort is expected to be completed by December 31 of each year.

Appendices

Appendix A
Public Resource Code

The laws and regulations concerning fire prevention on private land in Tehama County are enforced primarily by CalFire and by Tehama County authorities. The following list provides a summary of the major laws and regulations currently in force within Tehama County pertaining to fire prevention and fire safety.

PRC 4291 – *Defensible Space.* Any person that owns, leases, controls, operates, or maintains any building or structure in, upon, or adjoining any mountainous area or forest-covered lands, brush-covered lands, or grass-covered lands, or any land which is covered with flammable material, shall at all times do all of the following:

(a) Maintain around and adjacent to such building or structure a firebreak made by removing and clearing away, for a distance of not less than 30 feet on each side thereof or to the property line, whichever is nearer, all flammable vegetation or other combustible growth. This subdivision does not apply to single specimens of trees, ornamental shrubbery, or similar plants which are used as ground cover, if they do not form a means of rapidly transmitting fire from the native growth to any building or structure.

(b) Maintain around and adjacent to any such building or structure additional fire protection or firebreak made by removing all brush, flammable vegetation, or combustible growth which is located from 30 feet to 100 feet from such building or structure or to the property line, whichever is nearer, as may be required by the director if he finds that, because of extra hazardous conditions, a firebreak of only 30 feet around such building or structure is not sufficient to provide reasonable fire safety. Grass and other vegetation located more than 30 feet from such building or structure and less than 18 inches in height above the ground may be maintained where necessary to stabilize the soil and prevent erosion.

(c) Remove that portion of any tree which extends within 10 feet of the outlet of any chimney or stovepipe.

(d) Maintain any tree adjacent to or overhanging any building free of dead or dying wood.

(e) Maintain the roof of any structure free of leaves, needles, or other dead vegetative growth.

(f) Provide and maintain at all times a screen over the outlet of every chimney or stovepipe that s attached to any fireplace, stove, or other device that burns any solid or liquid fuel. The screen shall be constructed of nonflammable material with openings of not more than one-half inch in size.

(g) Except as provided in Section 18930 of the Health and Safety Code, the director may adopt regulations exempting structures with exteriors constructed entirely of nonflammable materials, or conditioned upon the contents and composition of same, he may vary the requirements respecting the removing or clearing away of flammable vegetation or other combustible growth with respect to the area surrounding said structures. No such exemption or variance shall apply unless and until the occupant thereof, or if there be no occupant, then the owner thereof, files with the department, in such form as the director shall prescribe, a written consent to the inspection of the interior and contents of such structure to ascertain whether the provisions hereof and the regulations adopted hereunder are complied with at all times.

At the present time, the California Department of Forestry and Fire Protection along with the State Fire Marshall's office is finalizing implementation of changes to PRC-4291. Significant changes to this section of the Public Resources Code include:

- ***Increasing the minimum defensible space clearance requirement from 30 feet to 100 feet;***
- ***Providing for state law, or local ordinance, rule or regulation to specify requirements of clearances greater than 100 feet; and***
- ***Allowing insurance companies to require home and commercial building owners to maintain fire breaks greater than 100 feet.***

PRC 4292. - *Power lines*. Except as otherwise provided in Section 4296, any person that owns, controls, operates, or maintains any electrical transmission or distribution line upon any mountainous land, or forest-covered land, brush-covered land, or grass-covered land shall, during such times and in such areas as are determined to be necessary by the director or the agency which has primary responsibility for fire protection of such areas, maintain around and adjacent to any pole or tower which supports a switch, fuse, transformer, lightning arrester, line junction, or dead end or corner pole, a firebreak which consists of a clearing of not less than 10 feet in each direction from the outer circumference of such pole or tower. This section does not, however, apply to any line which is used exclusively as telephone, telegraph, telephone or telegraph messenger call, fire or alarm line, or other line which is classed as a communication circuit by the Public Utilities Commission. The director or the agency which has primary fire protection responsibility for the protection of such areas may permit exceptions from the requirements of this section which are based upon the specific circumstances involved.

PRC 4293. Except as otherwise provided in Sections 4294 to 4296, inclusive, any person that owns, controls, operates, or maintains any electrical transmission or distribution line upon any mountainous land, or in forest-covered land, brush-covered land, or grass-covered land shall, during such times and in such areas as are determined to be necessary by the director or the agency which has primary responsibility for the fire protection of such areas, maintain a clearance of the respective distances which are specified in this section in all directions between all vegetation and all conductors which are carrying electric current:

(a) For any line which is operating at 2,400 or more volts, but less than 72,000 volts, four feet.

(b) For any line which is operating at 72,000 or more volts, but less than 110,000 volts, six feet.

(c) For any line which is operating at 110,000 or more volts, 10 feet.

In every case, such distance shall be sufficiently great to furnish the required clearance at any position of the wire, or conductor when the adjacent air temperature is 120 degrees Fahrenheit, or less. Dead trees, old decadent or rotten trees, trees weakened by decay or disease and trees or portions thereof that are leaning toward the line which may contact the line from the side or may fall on the line shall be felled, cut, or trimmed so as to remove such hazard. The director or the agency which has primary responsibility for the fire protection of such areas may permit exceptions

from the requirements of this section which are based upon the specific circumstances involved.

PRC 4294. A clearing to obtain line clearance is not required if self-supporting aerial cable is used. Forked trees, leaning trees, and any other growth which may fall across the line and break it shall, however, be removed.

PRC 4295. A person is not required by Section 4292 or 4293 to maintain any clearing on any land if such person does not have the legal right to maintain such clearing, nor do such sections require any person to enter upon or to damage property which is owned by any other person without the consent of the owner of the property.

PRC 4296. Sections 4292 and 4293 do not apply if the transmission or distribution line voltage is 750 volts or less.

PRC 4296.5 - *Railroads.*

(a) Any person or corporation operating a railroad on forest, brush, or grass-covered land shall, if ordered by the director or the agency having primary responsibility for fire protection of the area, destroy, remove, or modify so as not to be flammable any vegetation or other flammable material defined by regulation of the director to be a fire hazard on the railroad right-of-way. The director shall adopt regulations establishing fire prevention hazard reduction standards for broad geographic areas by fuel type, slope, and potential for ignition from hot or flaming exhaust, carbon particles, hot metal, burning signal devices, burning tobacco, and other similar potential sources of ignition.

(b) The order to destroy, removes, or modify vegetation or other flammable material shall specify the location of the hazard to be destroyed, removed, or modified within the right-of-way, the width of the hazard which shall not exceed the width of the right-of-way, and the time within which compliance with the order is required.

(c) The director or the agency having primary responsibility for fire protection of the area shall allow a reasonable period of time for compliance with an order to destroy, remove, or modify vegetation or other flammable material.

PRC 4297. Upon the showing of the director that the unrestricted use of any grass-covered land, grain covered land, brush-covered land, or forest-covered land is, in the judgment of the director, a menace to life or property due to conditions tending to

cause or allow the rapid spread of fires which may occur on such lands or because of the inaccessible character of such lands, the Governor through the director, may, by a proclamation, which declares such condition and designates the area to which, and the period during which the proclamation shall apply, require that such area be closed to hunting and fishing and to entry by any person except a person that is within one of the following classes:

(a) Owners and lessees of land in the area.

(b) Bona fide residents in the area.

(c) Persons engaged in some bona fide business, trade, occupation, or calling in the area and persons employed by them in connection with such business, trade, occupation, or calling.

(d) Authorized agents or employees of a public utility entering such area for the purpose of operating or maintaining public utility works or equipment within the area.

(e) Members of any organized firefighting force.

(f) Any federal, state or local officer in the performance of his duties.

(g) Persons traveling on public roads or highways through the area.

PRC 4298 - *Fire Closures*. The proclamation by the Governor shall be released to the wire news services in the state, and shall be published at least once in a newspaper of general circulation in each county which contains any lands covered by the proclamation. Notice of closure shall also be posted on trails or roads entering the area covered by the proclamation. The closure shall be effective upon issuance of the proclamation by the Governor. Each notice shall clearly set forth the area to be subject to closure and the effective date of such closure. The closure shall remain in full force and effect until the Governor shall by order terminate it. The notice of such termination shall follow the same procedure by which such closure was affected. The order of termination shall be effected upon issuance.

PRC 4299. Any person who violates Section 4297 or 4298 is guilty of a misdemeanor and shall be punished by a fine of not less than fifty dollars ($50) nor more than one thousand dollars ($1,000) or by imprisonment in the county jail for not less than 10 days nor more than 90 days or both such fine and imprisonment. All state and county law enforcement officers shall enforce orders of closure.

PRC 4475 – *Prescribed Fire*. The director, with the approval of the Director of General Services, may enter into a contract for prescribed burning with (1) the owner

or any other person who has legal control of any property or (2) any public agency with regulatory or natural resource management authority over any property which is included within any wildland for any of the following purposes, or any combination thereof:

(a) Prevention of high-intensity wildland fires through reduction of the volume and continuity of wildland fuels or removal of unwanted, unused, or deteriorated structures that are fire hazards by burning such fuels or structures.

(b) Watershed management.

(c) Range improvement.

(d) Vegetation management.

(e) Forest improvement.

(f) Wildlife habitat improvement.

No contract may be entered into pursuant to this section unless the director determines that the public benefits estimated to be derived from the prescribed burning pursuant to the contract will be equal to or greater than the foreseeable damage that could result from the prescribed burning.

PRC 4475.1. The director, with the approval of the Director of General Services, may enter into a master agreement with federal land management agencies to conduct joint prescribed burning operations on wildlands and federal lands where these operations serve the public interest and are beneficial to the state. This master agreement shall be known as the Interagency Agreement for Cooperative Use of Prescribed Fire and shall establish guidelines for the cooperative management of joint prescribed burning operations. The master agreement shall require the completion of a project agreement for each individual prescribed burn which shall include the following:

(a) A list of all participants.

(b) A joint prescribed burn plan.

(c) A display of the project costs to be assumed by each participant.

(d) A summary of the benefits to be received by each participant.

(e) An apportionment of suppression cost to each participant in the event a wildfire escapes from the project.

Project costs to be assumed by each agency or cooperator shall be based on the benefits received by each participant. The apportionment of suppression cost shall be based on the following:

(1) The benefits received by each participant.

(2) The amount at risk of each participant.

(3) The cost to produce the desired benefits received by each participant.

(4) The total acreage included by each participant.

PRC 4475.5. (a) The state may assume a proportionate share of the costs of site preparation and prescribed burning conducted pursuant to this article on wildlands other than wildlands under the jurisdiction of the federal government. The state's share of those costs shall bear the same ratio to the total costs of the operation as the public benefits bear to all public and private benefits to be derived from the prescribed burning operation, as estimated and determined by the director. The state's share of the costs may exceed 90 percent of the total costs of the operation only if the director determines that no direct private economic benefits will accrue or will be utilized by a person that owns or controls any property under contract pursuant to Section 4475.

(b) The board shall adopt regulations establishing standards to be used by the director in determining the state's share of such costs and in determining whether, pursuant to Section 4475, the public benefits of a prescribed burning operation will equal or exceed the foreseeable damage there from

(c) The determination of public and private benefits pursuant to this section shall reflect any substantial benefit to be derived from accomplishing any of the purposes specified in Section 4475 and the prevention of degradation of air quality.

(d) All or part of such costs to be borne by the person contracting with the department may be met by the value of materials, services, or equipment furnished by that person directly, or furnished by that person pursuant to an agreement with a private consultant or contractor, or furnished by a combination of both means, that are determined by the department to be suitable for the preparation for, and the conduct of, the prescribed burning operation.

PRC 4476. Any contract which is entered into pursuant to this article shall do all of the following:

(a) Vest in the director the final authority to determine the time during which wild land fuel and structural fire hazards may be burned to minimize the risk of escape of a fire set in a prescribed burning operation and to facilitate maintenance of air quality.

(b) Clearly state the obligation of each party to the contract to provide, maintain, and repair equipment and indicate the number of each type of equipment to be provided and the duration of its availability.

(c) Designate an officer of the department as the fire boss with final authority to approve and amend the plan and formula applicable to the prescribed burning operation, to determine that the site has been prepared and the crew and

equipment are ready to commence the operation, and to supervise the work assignments of departmental employees and all personnel furnished by the person contracting with the department until the prescribed burning is completed and all fire is declared to be out.

(d) Specify the duties of, and the precautions taken by, the person contracting with the department and any personnel furnished by that person.

(e) Provide that any personnel furnished by a person contracting with the department to assist in any aspect of site preparation or prescribed burning shall be an agent of that person for all purposes of worker compensation. However, any volunteer recruited or used by the department to suppress a wild land fire originating or spreading from a prescribed burning operation is an employee of the department for all purposes of worker compensation.

(f) Specify the value assigned to the materials, services, or equipment furnished by the person contracting with the department in lieu of payment of all or part of that person's share of the actual costs.

(g) Specify the total costs of the prescribed burning operation and the pro rata share thereof for each party to the contract. Any person contracting with the department shall, prior to the commencement of any work by the department, place on deposit in an interest-bearing escrow or trust account with a California-licensed financial institution an amount equal to that person's pro rata share of the costs, less the value of materials, services, or equipment specified pursuant to subdivision (e). Interest earned on the account shall accrue to the depositor and may be separately disbursed from the principal amount upon request of the depositor. Disbursement of funds on deposit in the trust or escrow account shall be authorized by the depositor within 15 days after completion, to the depositor's satisfaction, of all work specified in the contract to be done by the department.

(h) Provide that the department may, in its discretion, purchase a third party liability policy of insurance which provides coverage against loss resulting from a wild land fire sustained by any person or public agency, including the federal government. The amount of the policy, if purchased, shall be determined by the director. The policy shall name the person contracting with the department and the department as joint policyholders. The premium shall be included as a cost prorated as provided in subdivision (g). A 60 certificate of insurance, if purchased, covering each policy shall be attached to or become a part of the contract. If the department elects not to purchase insurance, the department shall agree to indemnify and hold harmless the person or public agency contracting with the department with respect to liability arising out of performance of the contract.

PRC 4477. If the amount of moneys due the state is not paid as provided in subdivision (e) of Section 4476, such amount shall become a lien upon the property.

(a) Notice of the lien shall be recorded by the department in the office of the county recorder of the county in which the property is situated within one year.

(b) An action to foreclose the lien shall be commenced by the Attorney General in the name of the people of the State of California within six months after the lien is filed and recorded.

(c)When the property is sold, enough of the proceeds to satisfy the lien and the costs of the foreclosure shall be paid to the state and the surplus, if any, shall be paid to the owner of the property.

PRC 4478. All moneys received by the department pursuant to this article shall be credited to the department's current support appropriation as a reimbursement.

PRC 4479. Liability for any costs incurred by the department in suppressing any wildland fire originating or spreading from a prescribed burning operation conducted pursuant to a contract entered into pursuant to this article shall be governed by subdivision (b)of Section 13009 of the Health and Safety Code.

PRC 4480. In any area of the state where there are substantially more requests for prescribed burning operations pursuant to this article than can be conducted directly by the department in a single fiscal year, the director may, with the approval of the Director of Finance, enter into an agreement with private consultants or contractors or with other public agencies for furnishing all or a part of the state's share of the responsibility for planning the operation, preparing the site, and conducting the prescribed burning. The private consultant or contractor or other public agency, and the work assignments of its employees, shall be supervised by the fire boss, as provided in subdivision (c) of Section 4476. No agreement may be entered into pursuant to this section unless the director determines that it will enable the prescribed burning operation to be conducted at a cost equal to, or less than, the cost that would otherwise be incurred by the state.

Appendix B

CALIFORNIA GOVERNMENT CODE 51182

51182. (a) Any person who owns, leases, controls, operates, or maintains any occupied dwelling or occupied structure in, upon, or adjoining any mountainous area, forest-covered land, brush-covered land, grass-covered land, or any land that is covered with flammable material, which area or land is within a very high fire hazard severity zone designated by the local agency pursuant to Section 51179, shall at all times do all of the following:

(1) Maintain around and adjacent to the occupied dwelling or occupied structure a firebreak made by removing and clearing away, for a distance of not less than 30 feet on each side thereof or to the property line, whichever is nearer, all flammable vegetation or other combustible growth. This paragraph does not apply to single specimens of trees, ornamental shrubbery, or similar plants that are used as ground cover, if they do not form a means of rapidly transmitting fire from the native growth to any dwelling or structure.

(2) Maintain around and adjacent to the occupied dwelling or occupied structure additional fire protection or firebreaks made by removing all brush, flammable vegetation, or combustible growth that is located within 100 feet from the occupied dwelling or occupied structure or to the property line, or at a greater distance if required by state law, or local ordinance, rule, or regulation. This section does not prevent an insurance company that insures an occupied dwelling or occupied structure from requiring the owner of the dwelling or structure to maintain a firebreak of more than 100 feet around the dwelling or structure if a hazardous condition warrants such a firebreak of a greater distance. Grass and other vegetation located more than 30 feet from the dwelling or structure and less than 18 inches in height above the ground may be maintained where necessary to stabilize the soil and prevent erosion.

(3) Remove that portion of any tree that extends within 10 feet of the outlet of any chimney or stovepipe.

(4) Maintain any tree adjacent to or overhanging any building free of dead or dying wood.

(5) Maintain the roof of any structure free of leaves, needles, or other dead vegetative growth.

(6) Provide and maintain at all times a screen over the outlet of every chimney or stovepipe that is attached to any fireplace, stove, or other device that burns

any solid or liquid fuel. The screen shall be constructed and installed in accordance with the California Building Standards Code.

(7) Prior to constructing a new dwelling or structure that will be occupied or rebuilding an occupied dwelling or occupied structure damaged by a fire in such zone, 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, 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, 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 maintain any clearing on any land if that person does not have the legal right to maintain the clearing, nor is any person required to enter upon or to damage property that is owned by any other person without the consent of the owner of the property.

Appendix C

Defensible Space
Adopted by BOF on February 8, 2006
Adopt 14 CCR, Division 1.5, Chapter 7 Fire Protection, Subchapter 3.,
Article 3. Fire Hazard Reduction Around Buildings and Structures

§ 1299. Defensible Space

The intent of this regulation is to provide guidance for implementation of Public Resources Code 4291(a) and (b), and minimize the spread of fire within a 100 foot zone around a building or structure.

(a) A person that owns, leases, controls, operates, or maintains a building or structure in, upon, or adjoining any mountainous area, forest-covered lands, brush-covered lands, grass-covered lands, or any land that is covered with flammable material, and is within State Responsibility Area, shall do the following:

(1) Within 30 feet from each building or structure maintain a firebreak by removing and clearing away all flammable vegetation and other combustible growth pursuant to PRC § 4291(a). Single specimens of trees or other vegetation may be retained provided they are well-spaced, well-pruned, and create a condition that avoids spread of fire to other vegetation or to a building or structure.

(2) Within the 30 feet to 100 feet zone (Reduced Fuel Zone) from each building or structure (or to the property line, whichever is nearer to the structure), provide a fuelbreak by disrupting the vertical and/or horizontal continuity of flammable and combustible vegetation with the goal of reducing fire intensity, inhibiting fire in the crowns of trees, reducing the rate of fire spread, and providing a safer environment for firefighters to suppress wildfire pursuant to PRC § 4291(b).

(b) Any vegetative fuels identified as a fire hazard by the fire inspection official of the authority having jurisdiction shall be removed or modified provided it is required by subsection (a)(1) & (a)(2).

(c) Within the intent of the regulations, the fire inspection official of the authority having jurisdiction may approve alternative practices which provide for the same practical effects as the stated guidelines.

(d) Guidance for implementation of this regulation is contained in the publication: “General Guidelines for Creating Defensible Space” as published by the Board of Forestry and Fire Protection by resolution adopted on February 8, 2006.

Note: Authority cited: Section 4102, 4291, 4125-4128.5, Public Resource Code. Reference: 4291, Public Resource Code. File: Defensible Space Regulations final § 1299 2_17_06.doc

Appendix D

Glossary

The following is list of common fire related terms that are in common usage among members of the fire and fuels management community and that are found in much of the literature pertaining to wildfire issues.

Aerial Fuels: All live and dead vegetation in the forest canopy or above surface fuels, including tree branches, twigs and cones, snags, moss, and high brush.

Aerial Ignition: Ignition of fuels by dropping incendiary devices or materials from aircraft.

Air Tanker: A fixed-wing aircraft equipped to drop fire retardants or suppressants.

Agency: Any federal, state, or county government organization participating with jurisdictional responsibilities.

Anchor Point: An advantageous location, usually a barrier to fire spread, from which to start building a fire line. An anchor point is used to reduce the chance of firefighters being flanked by fire.

Aramid: The generic name for a high-strength, flame-resistant synthetic fabric used in the shirts and jeans of firefighters. Nomex, a brand name for aramid fabric, is the term commonly used by firefighters.

Aspect: Direction toward which a slope faces.

Backfire: A fire set along the inner edge of a fireline to consume the fuel in the path of a wildfire and/or change the direction of force of the fire's convection column.

Backpack Pump: A portable sprayer with hand-pump, fed from a liquid-filled container fitted with straps, used mainly in fire and pest control. (See also Bladder Bag.)

Bambi Bucket: A collapsible bucket slung below a helicopter. Used to dip water from a variety of sources for fire suppression.

Behave: A system of interactive computer programs for modeling fuel and fire behavior that consists of two systems: BURN and FUEL.

Bladder Bag: A collapsible backpack portable sprayer made of neoprene or high-strength ny-

lon fabric fitted with a pump. (See also Backpack Pump.)

Blow-up: A sudden increase in fire intensity or rate of spread strong enough to prevent direct control or to upset control plans. Blow-ups are often accompanied by violent convection and may have other characteristics of a fire storm. (See Flare-up.)

Brush: A collective term that refers to stands of vegetation dominated by shrubby, woody plants, or low growing trees, usually of a type undesirable for livestock or timber management.

Brush Fire: A fire burning in vegetation that is predominantly shrubs, brush and scrub growth.

Bucket Drops: The dropping of fire retardants or suppressants from specially designed buckets slung below a helicopter.

Buffer Zones: An area of reduced vegetation that separates 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.

Bump-up Method: A progressive method of building a fire line on a wildfire without changing relative positions in the line. Work is begun with a suitable space between workers. Whenever one worker overtakes another, all workers ahead move one space forward and resume work on the uncompleted part of the line. The last worker does not move ahead until completing his or her space.

Burn Out: Setting fire inside a control line to widen it or consume fuel between the edge of the fire and the control line.

Burning Ban: A declared ban on open air burning within a specified area, usually due to sustained high fire danger.

Burning Conditions: The state of the combined factors of the environment that affect fire behavior in a specified fuel type.

Burning Index: An estimate of the potential difficulty of fire containment as it relates to the flame length at the most rapidly spreading portion of a fire's perimeter.

Burning Period: That part of each 24-hour period when fires spread most rapidly, typically from 10:00 a.m. to sundown.

Campfire: As used to classify the cause of a wildland fire, a fire that was started for cooking or warming that spreads sufficiently from its source to require action by a fire control agency.

Candle or Candling: A single tree or a very small clump of trees which is burning from the bottom up.

Chain: A unit of linear measurement equal to 66 feet.

Closure: Legal restriction, but not necessarily elimination of specified activities such as smoking, camping, or entry that might cause fires in a given area.

Cold Front: The leading edge of a relatively cold air mass that displaces warmer air. The heavier cold air may cause some of the warm air to be lifted. If the lifted air contains enough moisture, the result may be cloudiness, precipitation, and thunderstorms. If both air masses are dry, no clouds may form. Following the passage of a cold front in the Northern Hemisphere, westerly or northwesterly winds of 15 to 30 or more miles per hour often continue for 12 to 24 hours.

Cold Trailing: A method of controlling a partly dead fire edge by carefully inspecting and feeling with the hand for heat to detect any fire, digging out every live spot, and trenching any live edge.

Command Staff: The command staff consists of the information officer, safety officer and liaison officer. They report directly to the incident commander and may have assistants.

Complex: Two or more individual incidents located in the same general area which are assigned to a single incident commander or unified command.

Contain a fire: A fuel break around the fire has been completed. This break may include natural barriers or manually and/or mechanically constructed line.

Control a fire: The complete extinguishment of a fire, including spot fires. Fireline has been strengthened so that flare-ups from within the perimeter of the fire will not break through this line.

Control Line: All built or natural fire barriers and treated fire edge used to control a fire.

Cooperating Agency: An agency supplying assistance other than direct suppression, rescue, support, or service functions to the incident control effort; e.g., Red Cross, law enforcement agency, telephone company, etc.

Coyote Tactics: A progressive line construction duty involving self-sufficient crews that build fire line until the end of the operational period, remain at or near the point while off duty, and begin building fire line again the next operational period where they left off.

Creeping Fire: Fire burning with a low flame and spreading slowly.

Crew Boss: A person in supervisory charge of usually 16 to 21 firefighters and responsible for their performance, safety, and welfare.

Crown Fire (Crowning): The movement of fire through the crowns of trees or shrubs more or less independently of the surface fire.

Curing: Drying and browning of herbaceous vegetation or slash.

Dead Fuels: 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: A fire spreading from any fire originally set for the purpose of clearing land or for rubbish, garbage, range, stubble, or meadow burning.

Defensible Space: An area either natural or manmade where material capable of causing a fire to spread has been treated, cleared, reduced, or changed to act as a barrier between an advancing wildland fire and the loss to life, property, or resources. In practice, "defensible space" is defined as an area a minimum of 30 feet around a structure that is cleared of flammable brush or vegetation.

Deployment: See Fire Shelter Deployment.

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.

Dispatch: The implementation of a command decision to move a resource or resources from one place to another.

Dispatcher: A person employed who receives reports of discovery and status of fires, confirms their locations, takes action promptly to provide people and equipment likely to be needed for control in first attack, and sends them to the proper place.

Dispatch Center: A facility from which resources are directly assigned to an incident.

Division: Divisions are used to divide an incident into geographical areas of operation. Divisions are established when the number of resources exceeds the span-of-control of the operations chief. A division is located with the Incident Command System organization between the branch and the task force/strike team.

Dozer: Any tracked vehicle with a front-mounted blade used for exposing mineral soil.

Dozer Line: Fire line constructed by the front blade of a dozer.

Drip Torch: Hand-held device for igniting fires by dripping flaming liquid fuel on the materials to be burned; consists of a fuel fount, burner arm, and igniter. Fuel used is generally a mixture of diesel and gasoline.

Drop Zone: Target area for air tankers, helitankers, and cargo dropping.

Drought Index: A number representing net effect of evaporation, transpiration, and precipitation in producing cumulative moisture depletion in deep duff or upper soil layers.

Dry Lightning Storm: Thunderstorm in which negligible precipitation reaches the ground. Also called a dry storm.

Duff: The layer of decomposing organic materials lying below the litter layer of freshly fallen twigs, needles, and leaves and immediately above the mineral soil.

Energy Release Component (ERC): The computed total heat released per unit area (British thermal units per square foot) within the fire front at the head of a moving fire.

Engine: Any ground vehicle providing specified levels of pumping, water and hose capacity.

Engine Crew: Firefighters assigned to an engine. The Fireline Handbook defines the minimum crew makeup by engine type.

Entrapment: A situation where personnel are unexpectedly caught in a fire behavior-related, life-threatening position where planned escape routes or safety zones are absent, inadequate, or compromised. An entrapment may or may not include deployment of a fire shelter for its intended purpose. These situations may or may not result in injury. They include "near misses."

Environmental Assessment (EA): EAs were authorized by the National Environmental

Policy Act (NEPA) of 1969. They are concise, analytical documents prepared with public participation that determine if an Environmental Impact Statement (EIS) is needed for a particular project or action. If an EA determines an EIS is not needed, the EA becomes the document allowing agency compliance with NEPA requirements.

Environmental Impact Statement (EIS): EISs were authorized by the National Environmental Policy Act (NEPA) of 1969. Prepared with public participation, they assist decision makers by providing information, analysis and an array of action alternatives, allowing managers to see the probable effects of decisions on the environment. Generally, EISs are written for large-scale actions or geographical areas.

Equilibrium Moisture Content: Moisture content that a fuel particle will attain if exposed for an infinite period in an environment of specified constant temperature and humidity. When a fuel particle reaches equilibrium moisture content, net exchange of moisture between it and the environment is zero.

Escape Route: A preplanned and understood route firefighters take to move to a safety zone or other low-risk area, such as an already burned area, previously constructed safety area, a meadow that won't burn, natural rocky area that is large enough to take refuge without being burned. When escape routes deviate from a defined physical path, they should be clearly marked (flagged).

Escaped Fire: A fire which has exceeded or is expected to exceed initial attack capabilities or prescription.

Extended Attack Incident: A wildland fire that has not been contained or controlled by initial attack forces and for which more firefighting resources are arriving, en route, or being ordered by the initial attack incident commander.

Extreme Fire Behavior: "Extreme" implies a level of fire behavior characteristics that ordinarily precludes methods of direct control action. One of 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, sometimes dangerously.

Faller: A person who fells trees. Also called a sawyer or cutter.

Field Observer: Person responsible to the Situation Unit Leader for collecting and reporting

information about an incident obtained from personal observations and interviews.

Fine (Light) Fuels: Fast-drying fuels, generally with a comparatively high surface area-to-volume ratio, which are less than 1/4-inch in diameter and have a timelag of one hour or less. These fuels readily ignite and are rapidly consumed by fire when dry.

Fingers of a Fire: The long narrow extensions of a fire projecting from the main body.

Fire Behavior: The manner in which a fire reacts to the influences of fuel, weather and topography.

Fire Behavior Forecast: Prediction of probable fire behavior, usually prepared by a Fire Behavior Officer, in support of fire suppression or prescribed burning operations.

Fire Behavior Specialist: A person responsible to the Planning Section Chief for establishing a weather data collection system and for developing fire behavior predictions based on fire history, fuel, weather and topography.

Fire Break: A natural or constructed barrier used to stop or check fires that may occur, or to provide a control line from which to work.

Fire Cache: A supply of fire tools and equipment assembled in planned quantities or standard units at a strategic point for exclusive use in fire suppression.

Fire Crew: An organized group of firefighters under the leadership of a crew leader or other designated official.

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 Intensity: A general term relating to the heat energy released by a fire.

Fire Line: A linear fire barrier that is scraped or dug to mineral soil.

Fire Load: The number and size of fires historically experienced on a specified unit over a specified period (usually one day) at a specified index of fire danger.

Fire Management Plan (FMP): A strategic plan that defines a program to manage wildland and prescribed fires and documents the Fire Management Program in the approved land use plan. The plan is supplemented by operational plans such as preparedness plans, preplanned

dispatch plans, prescribed fire plans, and prevention plans.

Fire Perimeter: The entire outer edge or boundary of a fire.

Fire Regime Condition Class

The Fire Regime Condition Class (FRCC) describes the amount of departure of an area or landscape from the historic to present conditions. This departure from the natural state may be a result of changes in one or more ecosystem components such as fuel composition, fire frequency, or other ecological disturbances. The FRCC classification system and other considerations are used in the fire management program to rank existing ecosystem conditions and prioritize areas for fuels treatment. As taken from the Cohesive Implementation Strategy, FRCC is defined as follows:

FRCC1: "...fire regimes in this condition class are within historical ranges. Thus, the risk of losing key ecosystem components from the occurrence of fire remains relatively low. Maintenance management such as prescribed fire, mechanical treatments, or preventing the invasion of non-native weeds, is required to prevent these lands from becoming degraded."

FRCC2: "Fire Regimes on these lands have been moderately altered from their historical range by either increased or decreased fire frequency. A moderate risk of losing key ecosystem components has been identified in these lands. To restore their historical fire regimes, these lands may require some level of restoration as through prescribed fire, mechanical or chemical treatments, and the subsequent reintroduction of native plants."

FRCC3: "These lands have been significantly altered from their historical range. Because fire regimes have been extensively altered, risk of losing key ecosystem components from fire is high. Consequently, these lands verge on the greatest risk of ecological collapse. To restore their historical fire regimes before prescribed fire can be utilized to manage fuel or obtain other desired benefits these lands may require multiple mechanical or chemical restoration treatments, or reseeding."

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 Shelter: An aluminized tent offering protection by means of reflecting radiant heat and providing a volume of breathable air in a fire entrapment situation. Fire shelters should only be used in life-threatening situations, as a last resort.

Fire Shelter Deployment: The removing of a fire shelter from its case and using it as protection against fire.

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 whirls.

Fire Triangle: Instructional aid in which the sides of a triangle are used to represent the three factors (oxygen, heat, fuel) necessary for combustion and flame production; removal of any of the three factors causes flame production to cease.

Fire Use Module (Prescribed Fire Module): A team of skilled and mobile personnel dedicated primarily to prescribed fire management. These are national and interagency resources, available throughout the prescribed fire season, that can ignite, hold and monitor prescribed fires.

Fire Weather: Weather conditions that influence fire ignition, behavior and suppression.

Fire Weather Watch: A term used by fire weather forecasters to notify using agencies, usually 24 to 72 hours ahead of the event, that current and developing meteorological conditions may evolve into dangerous fire weather.

Fire Whirl: Spinning vortex column of ascending hot air and gases rising from a fire and carrying aloft smoke, debris, and flame. Fire whirls range in size from less than one foot to more than 500 feet in diameter. Large fire whirls have the intensity of a small tornado.

Firefighting Resources: All people and major items of equipment that can or potentially could be assigned to fires.

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. This

distance is less than the flame length if flames are tilted due to wind or slope.

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.

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.

Flanks of a Fire: The parts of a fire's perimeter that are roughly parallel to the main direction of spread.

Flare-up: Any sudden acceleration of fire spread or intensification of a fire. Unlike a blow-up, a flare-up lasts a relatively short time and does not radically change control plans.

Flash Fuels: Fuels such as grass, leaves, draped pine needles, fern, tree moss and some kinds of slash, that ignite readily and are consumed rapidly when dry. Also called fine fuels.

Forb: A plant with a soft, rather than permanent woody stem, that is not a grass or grass-like plant.

Fuel: Combustible material. Includes, vegetation, such as grass, leaves, ground litter, plants, 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 Loading: The amount of fuel present expressed quantitatively in terms of weight of fuel per unit area.

Fuel Model: 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 Moisture (Fuel Moisture Content): The quantity of moisture in fuel expressed as a percentage of the weight when thoroughly dried at 212 degrees Fahrenheit.

Fuel Reduction: Manipulation, including combustion, or removal of fuels to reduce the likelihood of ignition and/or to lessen potential damage and resistance to control.

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.

Fusee: A colored flare designed as a railway warning device and widely used to ignite suppression and prescription fires.

General Staff: The group of incident management personnel reporting to the incident commander. They may each have a deputy, as needed. Staff consists of operations section chief, planning section chief, logistics section chief, and finance/administration section chief.

Geographic Area: A political boundary designated by the wildland fire protection agencies, where these agencies work together in the coordination and effective utilization

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.

Haines Index: An atmospheric index used to indicate the potential for wildfire growth by measuring the stability and dryness of the air over a fire.

Hand Line: A fireline built with hand tools.

Hazard Reduction: Any treatment of a hazard that reduces the threat of ignition and fire intensity or rate of spread.

Head of a Fire: The side of the fire having the fastest rate of spread.

Heavy Fuels: Fuels of large diameter such as snags, logs, large limb wood, that ignite and are consumed more slowly than flash fuels.

Helibase: The main location within the general incident area for parking, fueling, maintaining, and loading helicopters. The helibase is usually located at or near the incident base.

Helispot: A temporary landing spot for helicopters.

Helitack: The use of helicopters to transport crews, equipment, and fire retardants or suppressants to the fire line during the initial stages of a fire.

Helitack Crew: A group of firefighters trained in the technical and logistical use of helicopters for fire suppression.

Holding Actions: Planned actions required to achieve wildland prescribed fire management objectives. These actions have specific implementation timeframes for fire use actions but can have less sensitive implementation demands for suppression actions.

Holding Resources: Firefighting personnel and equipment assigned to do all required fire suppression work following fireline construction but generally not including extensive mop-up.

Hose Lay: Arrangement of connected lengths of fire hose and accessories on the ground, beginning at the first pumping unit and ending at the point of water delivery.

Hotshot Crew: A highly trained fire crew used mainly to build fireline by hand.

Hotspot: A particular active part of a fire.

Hotspotting: Reducing or stopping the spread of fire at points of particularly rapid rate of spread or special threat, generally the first step in prompt control, with emphasis on first priorities.

Historic Fire Regime

The Historic Fire Regime (HFR) represents the fire return interval prior to Euro-American settlement and are calculated and classified by analyzing natural vegetation, known fire cycles, and fire history data. Based on the FRCC and HFR classifications, the Cohesive Strategy established the following national priorities for implementing vegetation treatments: Treat vegetation types within HFR Groups I, II, and III; Treat lands that have been either significantly altered (CC3) or moderately altered (CC2) from their historic range, and; Treat at least 2% of an agency's administered lands annually.

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 Action Plan (IAP): Contains objectives reflecting the overall incident strategy and specific tactical actions and supporting information for the next operational period. The plan may be oral or written. When written, the plan may have a number of attachments, including: incident objectives, organization assignment list, division assignment, incident radio communication plan, medical plan, traffic plan, safety plan, and incident map.

Incident Command Post (ICP): Location at which primary command functions are exe-

cuted. The ICP may be co-located with the incident base or other incident facilities.

Incident Command System (ICS): The combination of facilities, equipment, personnel, procedure and communications operating within a common organizational structure, with responsibility for the management of assigned resources to effectively accomplish stated objectives pertaining to an incident.

Incident Commander: Individual responsible for the management of all incident operations at the incident site.

Incident Management Team: The incident commander and appropriate general or command staff personnel assigned to manage an incident.

Incident Objectives: Statements of guidance and direction necessary for selection of appropriate strategy(ies), and the tactical direction of resources. Incident objectives are based on realistic expectations of what can be accomplished when all allocated resources have been effectively deployed.

Infrared Detection: The use of heat sensing equipment, known as Infrared Scanners, for detection of heat sources that are not visually detectable by the normal surveillance methods of either ground or air patrols.

Initial Attack: The actions taken by the first resources to arrive at a wildfire to protect lives and property, and prevent further extension of the fire.

Job Hazard Analysis: This analysis of a project is completed by staff to identify hazards to employees and the public. It identifies hazards, corrective actions and the required safety equipment to ensure public and employee safety.

Jump Spot: Selected landing area for smokejumpers.

Jump Suit: Approved protection suite work by smokejumpers.

Keech Byram Drought Index (KBDI): Commonly-used drought index adapted for fire management applications, with a numerical range from 0 (no moisture deficiency) to 800 (maximum drought).

Knock Down: To reduce the flame or heat on the more vigorously burning parts of a fire edge.

Ladder Fuels: Fuels which provide vertical continuity between strata, thereby allowing 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.

Large Fire: 1) For statistical purposes, a fire burning more than a specified area of land e.g., 300 acres. 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.

Lead Plane: Aircraft with pilot used to make dry runs over the target area to check wing and smoke conditions and topography and to lead air tankers to targets and supervise their drops.

Light (Fine) Fuels: Fast-drying fuels, generally with a comparatively high surface area-to-volume ratio, which are less than 1/4-inch in diameter and have a timelag of one hour or less. These fuels readily ignite and are rapidly consumed by fire when dry.

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 (i.e., LAL 3 indicates twice the lightning of LAL 2).

Line Scout: A firefighter who determines the location of a fire line.

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.

Micro-Remote Environmental Monitoring System (Micro-REMS): Mobile weather monitoring station. A Micro-REMS usually accompanies an incident meteorologist and ATMU to an incident.

Mineral Soil: Soil layers below the predominantly organic horizons; soil with little combustible material.

Mobilization: The process and procedures used by all organizations, federal, state and local for activating, assembling, and transporting all resources that have been requested to respond to or support an incident.

Modular Airborne Firefighting System (MAFFS): A manufactured unit consisting of five interconnecting tanks, a control pallet, and a nozzle pallet, with a capacity of 3,000 gallons, designed to be rapidly mounted inside an unmodified C-130 (Hercules) cargo aircraft for use in dropping retardant on wildland fires.

Mop-up: To make a fire safe or reduce residual smoke after the fire has been controlled by extinguishing or removing burning material along or near the control line, felling snags, or moving logs so they won't roll downhill.

Multi-Agency Coordination (MAC): A generalized term which describes the functions and activities of representatives of involved agencies and/or jurisdictions who come together to make decisions regarding the prioritizing of incidents, and the sharing and use of critical resources. The MAC organization is not a part of the on-scene ICS and is not involved in developing incident strategy or tactics.

Mutual Aid Agreement: Written agreement between agencies and/or jurisdictions in which they agree to assist one another upon request, by furnishing personnel and equipment.

National Environmental Policy Act (NEPA): NEPA is the basic national law for protection of the environment, passed by Congress in 1969. It 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.

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 Wildfire Coordinating Group: A group formed under the direction of the Secretaries of Agriculture and the Interior and comprised of 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 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.

Nomex ®: Trade name for a fire resistant synthetic material used in the manufacturing of flight suits and pants and shirts used by firefighters (see Aramid).

Normal Fire Season: 1) A season when weather, fire danger, and number and distribution of

fires are about average. 2) Period of the year that normally comprises the fire season.

Operations Branch Director: Person under the direction of the operations section chief who is responsible for implementing that portion of the incident action plan appropriate to the branch.

Operational Period: The period of time scheduled for execution of a given set of tactical actions as specified in the Incident Action Plan. Operational periods can be of various lengths, although usually not more than 24 hours.

Overhead: People assigned to supervisory positions, including incident commanders, command staff, general staff, directors, supervisors, and unit leaders.

Pack Test: Used to determine the aerobic capacity of fire suppression and support personnel and assign physical fitness scores. The test consists of walking a specified distance, with or without a weighted pack, in a predetermined period of time, with altitude corrections.

Paracargo: Anything dropped, or intended for dropping, from an aircraft by parachute, by other retarding devices, or by free fall.

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 damages at an unacceptable level.

Personnel Protective Equipment (PPE): All firefighting personnel must be equipped with proper equipment and clothing in order to mitigate the risk of injury from, or exposure to, hazardous conditions encountered while working. PPE includes, but is not limited to: 8-inch high-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.

Preparedness: Condition or degree of being ready to cope with a potential fire situation

Prescribed Fire: Any fire ignited by management actions under certain, predetermined conditions to meet specific objectives related to hazardous fuels or habitat improvement. A written, approved prescribed fire plan must exist, and NEPA requirements must be met, prior to ignition.

Prescribed Fire Plan (Burn Plan): This document provides the prescribed fire burn boss information needed to implement an individual prescribed fire project.

Prescription: Measurable criteria that define conditions under which a prescribed fire may be ignited, guide selection of appropriate management responses, and indicate other required actions. Prescription criteria may include safety, economic, public health, environmental, geographic, administrative, social, or legal considerations.

Prevention: Activities directed at reducing the incidence of fires, including public education, law enforcement, personal contact, and reduction of fuel hazards.

Project Fire: A fire of such size or complexity that a large organization and prolonged activity is required to suppress it.

Pulaski: A combination chopping and trenching tool, which combines a single-bitted axe-blade with a narrow adze-like trenching blade fitted to a straight handle. Useful for grubbing or trenching in duff and matted roots. Well-balanced for chopping.

Radiant Burn: A burn received from a radiant heat source.

Radiant Heat Flux: The amount of heat flowing through a given area in a given time, usually expressed as calories/square centimeter/second.

Rappelling: Technique of landing specifically trained firefighters from hovering helicopters; involves sliding down ropes with the aid of friction-producing devices.

Rate of Spread: The relative activity of a fire in extending its horizontal dimensions. It is expressed as a rate of increase of the total perimeter of the fire, as rate of forward spread of the fire front, or as rate of increase in area, depending on the intended use of the information. Usually it is expressed in chains or acres per hour for a specific period in the fire's history.

Reburn: The burning of an area that has been previously burned but that contains flammable fuel that ignites when burning conditions are more favorable; an area that has reburned.

Red Card: Fire qualification card issued to fire rated persons showing their training needs and their qualifications to fill specified fire suppression and support positions in a large fire suppression or incident organization.

Red Flag Warning: Term used by fire weather forecasters to alert forecast users to an ongoing or imminent critical fire weather pattern.

Rehabilitation: The activities necessary to repair damage or disturbance caused by wildland fires or the fire suppression activity.

Relative Humidity (Rh): The ratio of the amount of moisture in the air, to the maximum amount of moisture that air would contain if it were saturated. The ratio of the actual vapor pressure to the saturated vapor pressure.

Remote Automatic Weather Station (RAWS): An apparatus that automatically acquires, processes, and stores local weather data for later transmission to the GOES Satellite, from which the data is re-transmitted to an earth-receiving station for use in the National Fire Danger Rating System.

Resources: 1) Personnel, equipment, services and supplies available, or potentially available, for assignment to incidents. 2) The natural resources of an area, such as timber, crass, watershed values, recreation values, and wildlife habitat.

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.

Resource Order: An order placed for firefighting or support resources.

Retardant: A substance or chemical agent which reduced the flammability of combustibles.

Run (of a fire): The rapid advance of the head of a fire with a marked change in fire line intensity and rate of spread from that noted before and after the advance.

Running: A rapidly spreading surface fire with a well-defined head.

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 control 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.

Scratch Line: An unfinished preliminary fire line hastily established or built as an emergency measure to check the spread of fire.

Severity Funding: Funds provided to increase wildland fire suppression response capability necessitated by abnormal weather patterns, extended drought, or other events causing abnor-

mal increase in the fire potential and/or danger.

Single Resource: An individual, a piece of equipment and its personnel complement, or a crew or team of individuals with an identified work supervisor that can be used on an incident.

Size-up: To evaluate a fire to determine a course of action for fire suppression.

Slash: Debris left after logging, pruning, thinning or brush cutting; includes logs, chips, bark, branches, stumps and broken understory trees or brush.

Sling Load: Any cargo carried beneath a helicopter and attached by a lead line and swivel.

Slop-over: A fire edge that crosses a control line or natural barrier intended to contain the fire.

Smokejumper: A firefighter who travels to fires by aircraft and parachute.

Smoke Management: Application of fire intensities and meteorological processes to minimize degradation of air quality during prescribed fires.

Smoldering Fire: A fire burning without flame and barely spreading.

Snag: A standing dead tree or part of a dead tree from which at least the smaller branches have fallen.

Spark Arrester: A device installed in a chimney, flue, or exhaust pipe to stop the emission of sparks and burning fragments.

Spot Fire: A fire ignited outside the perimeter of the main fire by flying sparks or embers.

Spot Weather Forecast: A special forecast issued to fit the time, topography, and weather of each specific fire. These forecasts are issued upon request of the user agency and are more detailed, timely, and specific than zone forecasts.

Spotter: In smokejumping, the person responsible for selecting drop targets and supervising all aspects of dropping smokejumpers.

Spotting: Behavior of a fire producing sparks or embers that are carried by the wind and start new fires beyond the zone of direct ignition by the main fire.

Staging Area: Locations set up at an incident where resources can be placed while awaiting a tactical assignment on a three-minute available basis. Staging areas are managed by the opera-

tions section.

Strategy: The science and art of command as applied to the overall planning and conduct of an incident.

Strike Team: Specified combinations of the same kind and type of resources, with common communications, and a leader.

Strike Team Leader: Person responsible to a division/group supervisor for performing tactical assignments given to the strike team.

Structure Fire: Fire originating in and burning any part or all of any building, shelter, or other structure.

Suppressant: An agent, such as water or foam, used to extinguish the flaming and glowing phases of combustion when direction applied to burning fuels.

Suppression: All the work of extinguishing or containing a fire, beginning with its discovery.

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.

Swamper: (1) A worker who assists fallers and/or sawyers by clearing away brush, limbs and small trees. Carries fuel, oil and tools and watches for dangerous situations. (2) A worker on a dozer crew who pulls winch line, helps maintain equipment, etc., to speed suppression work on a fire.

Tactics: Deploying and directing resources on an incident to accomplish the objectives designated by strategy.

Temporary Flight Restrictions (TFR): A restriction requested by an agency and put into effect by the Federal Aviation Administration in the vicinity of an incident which restricts the operation of nonessential aircraft in the airspace around that incident.

Terra Torch ®: Device for throwing a stream of flaming liquid, used to facilitate rapid ignition during burn out operations on a wildland fire or during a prescribed fire operation.

Test Fire: A small fire ignited within the planned burn unit to determine the characteristic of

the prescribed fire, such as fire behavior, detection performance and control measures.

Timelag: Time needed under specified conditions for a fuel particle to lose about 63 percent of the difference between its initial moisture content and its equilibrium moisture content. If conditions remain unchanged, a fuel will reach 95 percent of its equilibrium moisture content after four timelag periods.

Torching: The ignition and flare-up of a tree or small group of trees, usually from bottom to top.

Two-way Radio: Radio equipment with transmitters in mobile units on the same frequency as the base station, permitting conversation in two directions using the same frequency in turn.

Type: The capability of a firefighting resource in comparison to another type. Type 1 usually means a greater capability due to power, size, or capacity.

Uncontrolled Fire: Any fire which threatens to destroy life, property, or natural resources, and

Underburn: A fire that consumes surface fuels but not trees or shrubs. (See Surface Fuels.)

Vectors: Directions of fire spread as related to rate of spread calculations (in degrees from upslope).

Volunteer Fire Department (VFD): A fire department of which some or all members are unpaid.

Water Tender: A ground vehicle capable of transporting specified quantities of water.

Weather Information and Management System (WIMS): An interactive computer system designed to accommodate the weather information needs of all federal and state natural resource management agencies. Provides timely access to weather forecasts, current and historical weather data, the National Fire Danger Rating System (NFDRS), and the National Interagency Fire Management Integrated Database (NIFMID).

Wet Line: A line of water, or water and chemical retardant, sprayed along the ground, that serves as a temporary control line from which to ignite or stop a low-intensity fire.

Wildland Fire: Any nonstructure fire, other than prescribed fire, that occurs in the wildland.

Wildland Fire Implementation Plan (WFIP): A progressively developed assessment and

operational management plan that documents the analysis and selection of strategies and describes the appropriate management response for a wildland fire being managed for resource benefits.

Wildland Fire Situation Analysis (WFSA): A decision-making process that evaluates alternative suppression strategies against selected environmental, social, political, and economic criteria. Provides a record of decisions.

Wildland Fire Use: The management of naturally ignited wildland fires to accomplish specific prestated resource management objectives in predefined geographic areas outlined in Fire Management Plans.

Wildland Urban Interface: The line, area or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.

Wind Vectors: Wind directions used to calculate fire behavior.

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