Alameda County Fire Department
835 E 14th Street San Leandro CA 94577
Tel (510) 618 3490 Fax (510) 618 3445
www acgov org/fire

SHELDON D GILBERT
Fire Chief

AGENDA ____ June 5, 2012

SERVING
City of Dublin
City of Newark
City of San Leandro
City of Union City
Lawrence Berkeley National Laboratory
Lawrence Livermore National Laboratory
Unincorporated Areas of Alameda County
Alameda County Regional Emergency Communications Center
Accredited Center of Excellence

May 20, 2012

The Honorable Board of Directors
County Administration Building
1221 Oak Street
Oakland, California 94612

Dear Directors

SUBJECT **APPROVE THE ALAMEDA COUNTY COMMUNITY WILDFIRE PROTECTION PLAN**

RECOMMENDATION

Approve and accept the Community Wildfire Protection Plan

SUMMARY/DISCUSSION

The Diablo Fire Safe Council in conjunction with the Alameda County Fire Chief's Association, the Hills Emergency Forum, the Oakland Wildfire Prevention Assessment District, and Stakeholder Committee Members have prepared a Community Wildfire Protection Plan (CWPP) that accounts for all parts of Alameda County

The CWPP will act as a multi-year guiding document that will facilitate the implementation of present and future mitigation efforts It should be noted that this document follows the standards established by the Federal Healthy Forest Restoration Act As such individual entities applying for Federal Grants will be given additional credit because our County has a CWPP

The goal of the CWPP is to reduce hazard through increased information and education about wildfires, hazardous fuels reduction, actions to reduce structure ignitability and other recommendations to facilitate emergency preparedness and fire suppression efforts Since the document complements existing local

agreements and plans for wildfire protection all current rules remain in effect The CWPP is a working document that will need to be updated annually and after major "events" such as wildfire, flood, insect infestation or even significant new home development in order to remain an effective tool

FINANCIAL

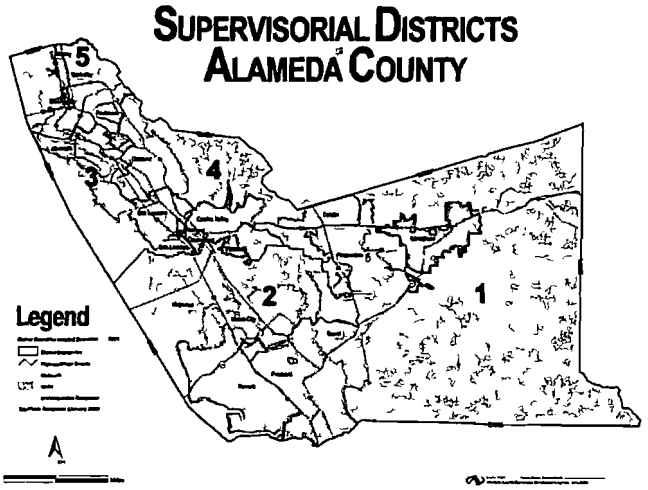
There are no costs associated with the acceptance and approval of this plan

Yours truly,

Sheldon D Gilbert
Fire Chief

G \ADMIN\FINANCIAL\Finance Team\BOS Letters\FY 2011 12\Board Letter Community Wildfie Protection Plan_06052012 docx

Final Draft
5/11/2012

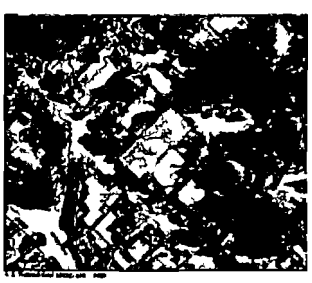
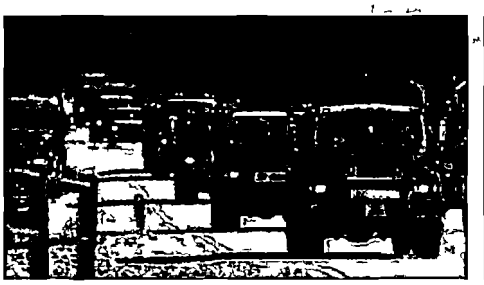


CWPP

Community Wildfire Protection Plan
Alameda County

Prepared by
Diablo Fire Safe Council

In conjunction with the
Alameda County Fire Chiefs Association
Hills Emergency Forum
Oakland Wildfire Prevention Assessment District
Stakeholder Committee Members


Executive Summary

This document provides a comprehensive, scientifically based analysis of wildfire related to the hazards and risk in the wildland-urban interface (WUI) areas of Alameda County, CA The analysis is delivered in the form of a Community Wildfire Protection Plan (CWPP) and follows the standards for CWPPs that have been established by the federal Healthy Forest Restoration Act by

1 Identifying and prioritizing fuel reduction opportunities across the county
See Section 2 Fire Hazard and Risk in the Wildland Urban Interface and Section 4 Prioritizing Fuel Reduction Vegetation Management Treatments

2 Addressing structural ignitability
See Section 5 Prioritized Treatment of Structural Ignitability

3 Collaborating with stakeholders
See Section 1 2 Stakeholders

Using the results of the analysis, recommendations have been generated that aid stakeholders in preventing and reducing the threat of wildfire in Alameda County

This report complements local agreements and existing plans for wildfire protection for a coordinated effort in determining appropriate fire management actions

The Alameda County CWPP is the result of an area-wide planning effort with compilation of existing documents, analysis of fire behavior potential (based on fuels, topography and historical weather conditions) and collaboration with homeowners, representatives of special interest groups and agency officials

The goal of the CWPP is to reduce hazard through increased information and education about wildfires, hazardous fuels reduction, actions to reduce structure ignitability and other recommendations to facilitate emergency preparedness and fire suppression efforts

Recommendations

The CWPP's recommendations are organized into four broad categories of mitigation

- Information, Education and Collaborative Planning Priorities
- Enhanced Suppression Capability and Emergency Preparedness Priorities
- Fuel Reduction Treatments around Homes and on Public Lands and Related Priorities
- Improving Survivability of Structures Priorities

Action Plan summaries are provided for a selection of priority activities These summaries identify implementation steps, lead and partners, timeframes and funding needs

The Alameda County CWPP is a multi-year guiding document that will facilitate the implementation of present and future mitigation efforts It is important to note that the Alameda County CWPP is a working document and will need to be updated annually and after major "events" such as wildfire, flood, insect infestation or even significant new home development Stakeholders recommend that it also be reviewed in more detail in conjunction with the regional update of the Multi-Hazard Mitigation Plan facilitated through the Association of Bay Area Governments (ABAG) and General Plan Safety Element updates by local jurisdictions

Table of Contents

The Alameda County Community Wildfire Protection Plan was developed with funding provided by a National Fire Plan grant from the Cooperative Fire Program of the U S Forest Service Department of Agriculture, Pacific Southwest Region, through the California Fire Safe Council

Introduction

Fire records for Alameda County document an active, damaging and costly fire history There is little question that the area's unique ecology - particularly the topography, climate and vegetation - provides the setting for catastrophic fire to strike While large-scale fires do not occur every year, fire incidents driven by extreme wind conditions have repeatedly been difficult to contain Contemporary population growth leading to residential development in the wildland urban interface (WUI) along with the introduction and proliferation of exotic species exacerbates this problem by putting more people, property, critical infrastructure and natural resources in harm's way In order to reduce the risk of loss of life and property due to wildfire, the Diablo Fire Safe Council and project partners have worked with residents, representatives of federal, regional, state and local agencies along with community organizations to prepare the Community Wildfire Protection Plan

Although the format of this CWPP is guided by the Healthy Forest Restoration Act's (HFRA) call for such plans, the principles behind it are not new The National and State Fire Plans, the Federal Emergency Management Agency Disaster Mitigation Act of 2000 and several locally developed documents all mandate community based planning efforts, coordination, project identification, prioritization, funding review and multi-agency cooperation Unique benefits of the CWPP include

- The opportunity to establish a locally appropriate definition and boundary for the WUI
- The requirement for federal agencies, when planning fuel reduction projects, to give priority to projects that provide for the protection of at-risk communities or watersheds, or that implement recommendations in a CWPP
- Expedited National Environmental Policy Act (NEPA) procedures for federal agencies implementing fuel reduction projects identified in a CWPP

Since within Alameda County there are few federally owned lands the stakeholder group brainstormed what the Alameda County CWPP should address and why is the plan is of value to us The ideas can be grouped around several themes including future fires and the impact of climate change, fire suppression, access and traffic management especially during fires, neighborhood issues, awareness, outreach and education, fuel reductions and structure ignitability [1]

[1] See www.diablofiresafe.org/pdf/Summary_CWPP_Mtg2.pdf for detailed Summary of Working Session #2

Scope

The scope of this Plan is Countywide and encompasses the following

1 Describes the fire environment of Alameda County

2 Identifies values at risk as defined by the stakeholders

3 Provides maps that show high fire hazard areas, as defined by Federal, State and local authorities

4 Establishes the rationale for prioritization of fuel management projects and treatment methods, as well as outlines principles for selection of projects when funding is available

5 Describes measures communities and homeowners can take to reduce the ignitability of structures

6 Identifies sources for Best Management Practices for fuel reduction treatments included in the plan

7 Identifies federal, state and local resources (fire, wildlife, regulatory agencies, landscape groups, etc)

Purpose

The Purpose of this CWPP is to protect human life and reduce loss of property, critical infrastructure and natural resources due to wildfire The document is intended to help agencies, communities and local homeowners define, plan and prioritize types of actions that will limit the damage associated with the inevitable wildland fire event This plan can be used to reduce the risk of conflagration by the following actions

1 Increased collaborative planning and cooperative actions that will build useful relationships between communities and agencies

2 Reduction of hazardous fuels in the WUI

3 Creation and maintenance for defensible space for structures and properties

4 Reduction of structural ignitability hazards

5 Planning of evacuation protocols and drills

The stakeholders in this effort believe that the work outlined above requires a collaborative approach that combines the following elements

- Development and implementation of strategic, cost effective, sustainable and environmentally sensitive fuel management plans,
- Educational programs that explain fire risk, promote voluntary citizen involvement and emphasize long-term strategies for creating and maintaining fire resistant communities
- Application of resources to areas and projects where efficacy is most probable

To that end, stakeholder participation and regular review are central to maintaining the ideas and priorities of the CWPP in the future The dynamic nature of the CWPP will reflect changes in practices, technology and information available to prevent and minimize loss from wildfire

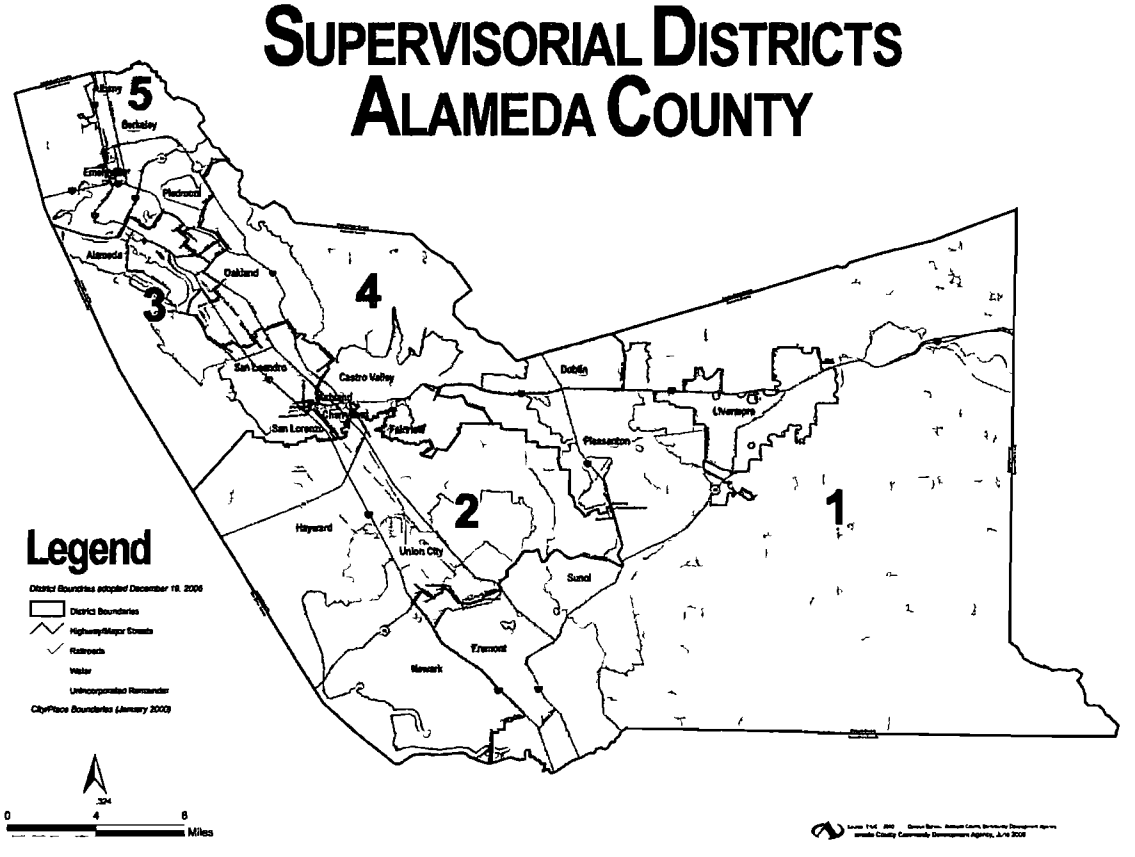
Alameda County Information

1 1 County Overview

Alameda County was incorporated in 1853, carved out of previously established neighboring Contra Costa and Santa Clara Counties As of the 2010 census its population is 1,510,271, making it the 6th most populous county in the state [1] The census also lists the county with a total area of 739 02 square miles for a total of 2,043 people per square mile [2] Most of the population resides in the 14 incorporated cities and six unincorporated communities

By 2030, Alameda County is anticipated to have nearly 1 9 million residents [3] The cities in northern Alameda County are projected to have 40% of this population growth, with the largest share in Oakland East County is expected to have the highest percentage change in population, with the Dublin area increasing in population by 172% by 2030

The most heavily urbanized areas are in the cities of Berkley and Oakland, with a continuous pattern of suburban development expanding southward to Fremont The eastern Livermore-Amador Valley, although still agriculturally productive is experiencing considerable suburban development from the cities of Dublin, Livermore and Pleasanton



[1] Data from http //www alameda courts ca gov/pages aspx/about alameda county accessed 11/29/11

Development Centers

Development in Alameda County originally centered on established cities such as Oakland, Berkeley and Alameda, with additional town centers in places such as Hayward, Pleasanton and Livermore These original communities were relatively compact with grid street patterns However, development eventually spread southward to communities such as Castro Valley, Union City, and Fremont and east across the hills to Dublin and outlying portions of Pleasanton and Livermore Development intensities vary greatly across the county Emeryville now has the highest average residential density- more than 20 units per acre In contrast the average residential densities in the Livermore-Amador Valley cities of Dublin, Livermore and Pleasanton range from 5 to 6 units per acre [4]

West County	East County (Tri Valley)
Incorporated Cities	*Incorporated Cities*
Alameda	Dublin
Albany	Livermore
Berkeley	Pleasanton
Emeryville	*Unincorporated Areas*
Fremont	Altamont
Hayward	Brightside
Newark	Brookshire
Oakland	Castlewoods
Piedmont	Kilkare Woods
San Leandro	Komandorski Village
Union City	Mendenhall Springs
Unincorporated Areas	Scotts Corner
Ashland	Sunol
Castro Valley	
Cherryland	
Fairview	
Five Canyons	
San Lorenzo	

Transportation

Alameda County is home to some of the most heavily traveled freeways and arterials in the San Francisco Bay Area [5] Loss of function of any of these routes can have direct regional impacts that could be felt nationwide The County is connected with major interstate highways and regional transportation systems These include north-south freeways of I-80, I-680 I-880, I-980, and east-west freeways of I-238, I-580, I-680 These major interstates are supplemented by state freeways SR-13, SR-24,SR-61,SR-84, SR- 92, SR 123, SR 185, SR 238, SR 262 This network provides access to three of the key bridges that cross the San Francisco Bay (Bay Bridge, San Mateo and Dumbarton Bridges) interconnecting the nine county San Francisco Bay area

Mass Transit includes both buses that use these highway corridors and commuter rail Commuter rail lines connect to Contra Costa County and San Francisco (Bay Area Rapid

---

[2] Data from http://quickfacts census gov/qfd/states/06/06001 html accessed 11/29/11

[3] Data from http //www bayareavision org/initiatives/ accessed 11/29/11

[4] Data from http //www bayareavision org/initiatives/ accessed 11/29/11

[5] From Alameda County Transportation Commission County Transportation Plan/ Transportation Expenditure Plan Briefing Book March 3 2011 Pg 4 2

Transit, BART), San Joaquin and Santa Clara Counties (Altmont Commuter Express Train, ACE), San Jose and Sacramento (AMTRAK Capitol Corridor) Ferries provide another commuter route, connecting across San Francisco Bay from Alameda, Oakland and Harbor Bay Island With the third busiest container shipping port on the West coast, Oakland international airport (a world-class international cargo transportation and distribution hub) and numerous rail and trucking resources, Alameda County is a critical hub for goods movement nationwide

Geographic Features

Two major complexes of mountains, ridges and hills that run northeast to southwest define the physical and hydrological landscape

> The western part of the county consists of a 32-mile plain sloping toward the San Francisco Bay from the East Bay Hills (including San Leandro Hills and Walpert Ridge)
>
> The eastern part of the county is considered the Tri-Valley area This triangular shape region, located south of Mount Diablo, includes the Livermore Valley, Amador Valley and the San Ramon Valley (in Contra Costa County)

Elevations begin at sea level and reach 3,840 feet along the Valpe Ridge in the northern Diablo Range (in the southeastern portions of the County) These geographic features shape where people live and work, and results in numerous people inhabiting areas that are remote or very difficult to access under emergency conditions

Natural Resources

The county contains an abundance of vegetative, water, air, biotic and agricultural resources The western areas are highly industrialized, while the eastern sections contain suburban residential and commercial areas, interspersed with agricultural and livestock grazing lands along with parklands, watershed and other undeveloped areas The southeastern portions of the county include rugged terrain and sparsely populated areas The cities in the east portion of the county have adopted Urban Growth Boundaries and policies reflecting a strong commitment to protecting the natural and agricultural resources within and surrounding their respective jurisdictions [6]

Watersheds

Alameda County has over 100 watersheds ranging in size from just a few acres to some that overlap into other Counties [7] The EPA recognizes that Alameda County crosses 6 major watersheds [8] All the creeks feed ultimately into the San Francisco Bay Those in the eastern parts feed into with the San Joaquin Delta, Panoche-San Luis Reservoir or flow north toward the Suisun Bay or San Pablo Bay, or in the south flow through the Coyote watershed The Alameda Creek watershed is the largest in the county encompassing almost 700 square miles (draining roughly the southern two-thirds of the east bay including parts of Contra Costa and Santa Clara Counties) [9]

---

[6] Source East Alameda County Conservation Strategy http //eastalco conservation org/documents html

[7] Source http //www cleanwaterprogram org/index php?option=com_zoo&view=item&Itemid=264

[8] Source http //cfpub epa gov/surf/county cfm?fips_code=06001

[9] Source http //www alamedacreek org/About_Alameda_Creek/About%20Alameda%20Creek htm

The county also contains watersheds that form a crucial part of the Bay area's domestic water with several large reservoirs serving both major East Bay and San Francisco population centers (EBMUD serves approximately 1 3 million people and the San Francisco PUC serves approximately 2 5 million people) A total of 17 water purveyors provide domestic water to residents in the County Some draw water from the State aqueduct, while other manage watershed lands

Vegetation and Wildlife Habitat

The vegetation and wildlife habitats of Alameda County consist of many ecological communities including

- Shrub dominated communities wet north coastal scrub (northeast facing scrub or north coastal Franciscan scrub), dry north coastal scrub (southwest facing scrub or coyote brush-sagebrush scrub, manzanita-chinquapin chaparral, emergent coyote brush scrub
- Grass dominated communities serpentine grassland, predominantly native grasslands, emergent coyote brush grassland
- Forest or woodland communities live oak-bay woodland, redwood forest, willow riparian forest
- Rare plant associations *Prunus emarginata* woodlands, woodland and brushland habitats containing *Dirca occidentalis*
- Non-native communities eucalyptus forest, Monterey/ bishop pine forests, predominantly non-native grasslands, broom
- Other landscape features springs and seeps, landslides, ecotones, disturbed areas, landscape areas

Numerous plants and animals that are designated as rare, threatened or endangered species or are candidates for such designation occur here These include both federally and state-listed species Information about vegetation and habitat is included in the *Best Management Practices Guidebook for Fuel Management Treatments in Contra Costa County* (developed for in 2009 as part of the Contra Costa County CWPP), the *Vegetation Management Almanac for the East Bay Hills* and other resource documents referenced in the Appendix

Alameda County also contains critical habitat for nine species

- Alameda whipsnake (*Masticophis lateralis euryxanthus*),
- California tiger salamander (*Ambystoma californiense*),
- longhorn fairy shrimp *(Branchinecta longiantenna),*
- red-legged frog (*Rana draytonii),*
- vernal pool fairy shrimp *(Branchinecta lynchii),*
- vernal pool tadpole shrimp *(Lepidurus packardi)*
- Delta smelt *(Hypomesus transpacificus),*
- steelhead *(Oncorhynchus mykiss),*
- Contra Costa goldfields *(Lasthenia conjugens)*

Public Lands Management

There are several agencies that manage large areas of public lands in the county

California Department of Parks and Recreation owns and manages approximately 9,660 acres in the eastern part of the county with three recreation areas (Bethany Reservoir, Carnegie State Vehicular area and Lake Del Valle)

East Bay Regional Park Districts (EBRPD) offers developed and dispersed recreation opportunities in over 110,000 acres in Alameda and Contra Costa Counties In Alameda County they manage large regional parks, wilderness and preserves, in additional to smaller recreation areas, preserves, regional shorelines and trails, including Anthony Chabot Regional Park (5,065 acres), Brushy Peak Regional Preserve (406 acres) Del Valle Regional Park (5,005 acres), Dublin Hills Regional Park (520 acres),Garin/ Dry Creek Pioneer (4,763 acres), Mission Peak Regional Preserve (406), Ohlone Regional Wilderness (8,714 acres), Pleasanton Ridge Regional Park (3,387 acres), Redwood Regional Park (1,829 acres, a portion is in Contra Costa County), Sunol Regional Wilderness (6,881 acres) and Vargas Plateau Regional Park (1,043 acres)

East Bay Municipal Utility District (EBMUD) owns and manages land and water areas and is responsible for management surrounding two reservoirs located in Alameda County 8,117 acres Upper San Leandro Watershed and 794 acre reservoir, as well as the 340 acre Chabot Reservoir (3,920 acres of the surrounding watershed land is leased to EBRPD) and 7 5 acre Chabot Park leased to the City of San Leandro

Hayward Area Recreation District (HARD) is an independent special use district proving park and recreation services for over 250,000 residents living with a 64 square miles area including City of Hayward, Castro Valley, and unincorporated Ashland, Cherryland and Fairview Districts Park lands in the WUI areas include Five Canyons Park (12 acres), Rowell Ranch (43 acres), East Avenue Park (27 acres) and Greenbelt Trails (109 acres)

Livermore Area Recreation and Parks District (LARPD) owns and operates approximately 1,360 acres of natural open space parks, preserves and trail facilities including Garaventa Wetlands Preserve (24 acres), Holdener Park (55 acres), Sycamore Grove Park/ Veterans Park (774 acres)

City of Oakland owns and manages approximately 2,500 acres of open space including 100 parks Park lands in the WUI areas include Beaconsfield Canyon (5 acres), Caldecott Field/ North Oakland Regional Sport Center, Diamond Park/ Diamond Canyon (41 acres), Dunsmuir Hellman Historic Estate, Firestorm Memorial Garden, Garber Park (13 acres), Joaquin Miller Park (280 acres), Knowland Park and Oakland Zoo (500 acres), King Estates Open Space (75 acres), Lake Chabot Golf Course (182 acres), Leona Open Space (293 acres), Pinto Park, Shepherd Canyon Park (25 acres)

San Francisco Public Utilities Commission (SFPUC) owns, leases and manages watersheds in Alameda County The Alameda Watershed is split between Santa Clara and Alameda Counties and includes 36,000 acres (23,000 are in Alameda County and include two major reservoirs, San Antonio and Calaveras) The watershed and reservoir are a part of a complex series of reservoirs, tunnels, pipelines and treatments systems making the SFPUC the third largest municipal utility in California serving 2 5 million residential, commercial and industrial customers in the Bay Area They provide not only to retail customers in San Francisco, but two-thirds of their water is as wholesale deliveries to 28 suburban agencies in Alameda, Santa Clara and San Mateo [10]

[10] San Francisco Public Utilities Commission website www sfwater org/index aspx?page=355 accessed 3/15/2012

University of California, Berkeley owns and manages approximately 850 acres of wildlands in the Oakland hills Limited development within this area includes several campus facilities, trails, roadways, infrastructure and approximately 202 acre area leased to the Lawrence Berkeley National Laboratory (LBNL)

Tri-Valley Conservancy oversees conservation easements and manages lands in eastern Alameda County, including north and south Livermore, south Pleasanton, west Altamont Hills and future Chain of Lakes Recreation Area

Federal Lands

US Fish and Wildlife Service (USFWS) The US Fish and Wildlife Service owns and manages the Don Edwards San Francisco Bay National Wildlife Refuge, the first urban National Wildlife Refuge established in the United States The Don Edwards San Francisco Bay National Wildlife Refuge is part of a complex made up of six other wildlife refuges in the San Francisco Bay Area As of 2004 the Refuge spans 30,000 acres of open bay, salt pond, salt marsh, mudflat, upland and vernal pool habitats The creeks from the hills above Hayward, Union City and Fremont drain into the refuge, tying the health of the upper watersheds to this nationally significant wildlife resource

Alameda County stakeholders have also worked closely with the USFWS regional and zone fire management programs, the Recovery Program on critical habitat for the Alameda Whipsnake, and in Section 7 consultations for Biological Opinions related to fuel modification projects USFWS funded the Diablo Fire Safe Council's development of the Best Management Practices Guidebook for Hazardous Fuel Treatments in Contra Costa County, California in 2009 by a grant through the California Fire Safe Council

Camp Parks Combat Support Training Area, Department of the Army Camp Parks is a U S Army facility located in the City of Dublin and occupies approximately 2,498 acres It includes numerous buildings and facilities including ranges and training facilities

Department of Energy There are three National Laboratories in Alameda County that are supported by the Department of Energy through its Office of Science

Lawrence Berkeley National Laboratory (LBNL) is managed by the University of California for the Department of Energy Its 200 acre site is located in the hills above the University of California Berkeley campus and the City of Berkeley

Lawrence Livermore National Laboratory (LLNL) owns and operates the urban "Livermore site" of approximately 820 acres on the eastern edge of the city of Livermore It also owns a rural experimental test site "Site 300," approximately 7,000 acres that straddles the Alameda and San Joaquin County lines

Sandia California National Laboratory is a science and engineering laboratory located on 410 acres in Livermore across from LLNL's urban "Livermore site" [11]

National Park Service (NPS) While there are no National Park Service public lands in Alameda County, portions of the Juan Bautista de Anza National Historic Trail run through Alameda County The Pacific West Regional Office is located in San Francisco and oversees NPS owned and managed lands throughout the San Francisco Bay region and western United States The Fire Management Office regularly exchanges information with other Alameda County stakeholders on best management practices for wildfire management

Bureau of Land Management (BLM) While there are no Bureau of Land Management lands in Alameda County local stakeholders have worked closely with BLM staff from the Hollister

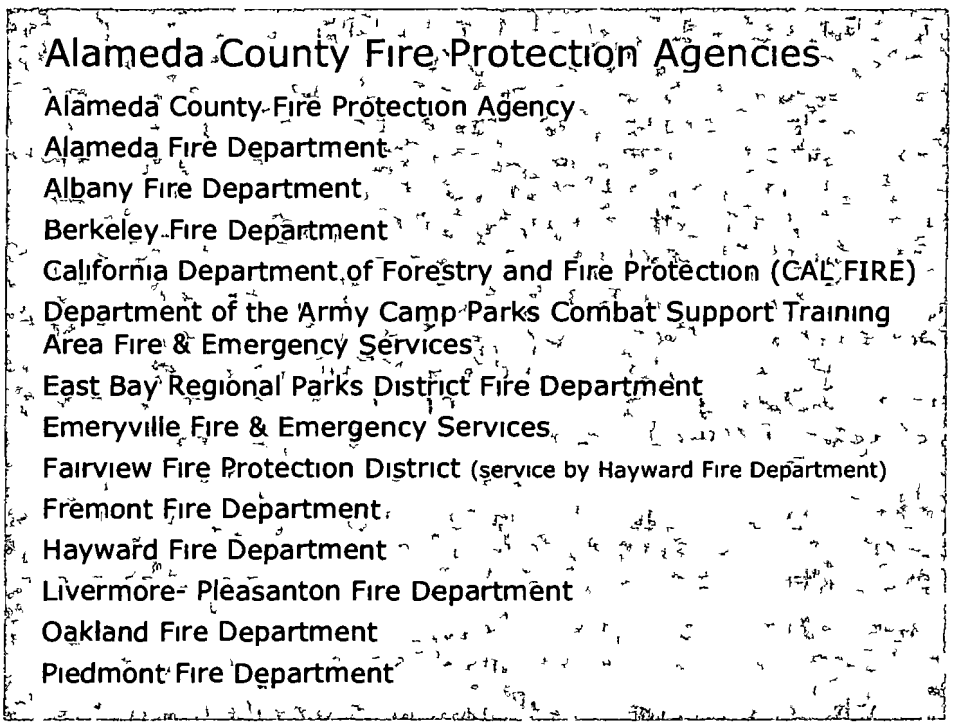
---

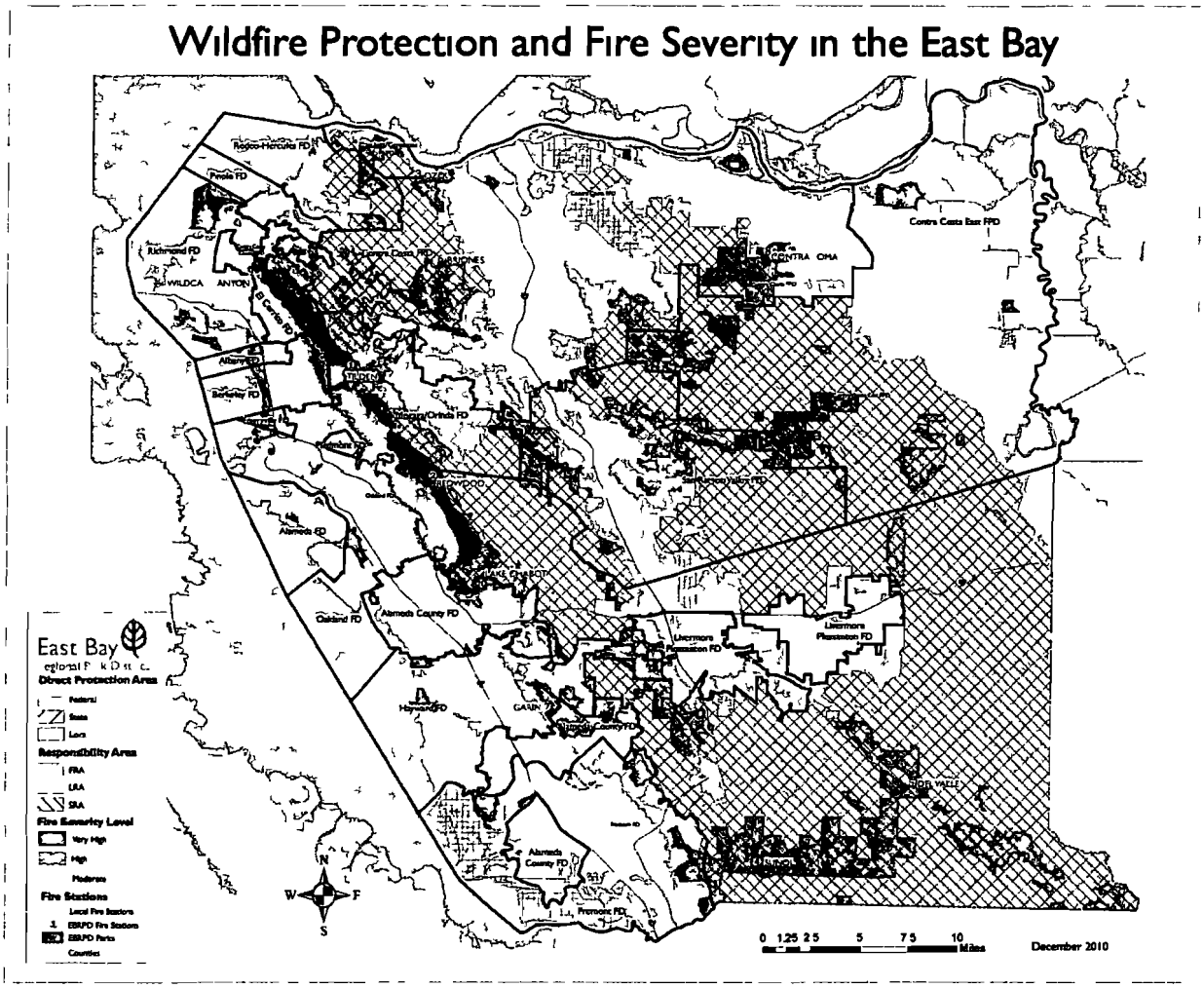
[11] From Site Environmental Report for 2010 Sandia National Laboratories California www ca sandia gov/about/assets/documents/2010_ASER pdf accessed 12/8/2011

Office in conjunction with federal grants for public education and fuel reduction projects The BLM often takes the lead on environmental compliance review for grant projects funded by Federal agencies through the California Fire Safe Council

Fire Protection Agencies

Alameda County has thirteen different entities that have direct fire protection responsibility A detailed list of fire agency contacts can be found in the Appendix




Wildfire Protection and Fire Severity in the East Bay
East Bay
Direct Protection Area
Responsibility Area
Fire Severity Level
Fire Stations
Richmond FD
Berkeley FD
Oakland FD
Alameda FD
Alameda County FD
Hayward FD
Livermore Pleasanton FD
Contra Costa FPD
CONTRA COSTA
0 1.25 2.5 5 7.5 10
Miles
December 2010

1 2 The Planning Process & Stakeholders

Development of the Alameda County CWPP was made possible through a National Fire Plan grant from the Cooperative Fire Program of the US Forest Service Department of Agriculture, Pacific Southwest Region, through the California Fire Safe Council to the Diablo Fire Safe Council (DFSC) The grant could not have been possible without matching in kind services of the Alameda County Association of Fire Chiefs , Diablo Fire Safe Council Board of Directors, members of the Hills Emergency Forum and the Oakland Wildfire Prevention Assessment District Advisory Committee

The eighteen-month planning process followed an eight-step process that included 6 stakeholder meetings, 3 workshops, outreach during the 20 year anniversary of the 1991 Oakland-Berkeley Hills fire and presentations to community groups Materials were regularly updated on the Diablo Fire Safe Council web site at www diablofiresafe org/ala co CWPP html A community survey was also available on app fluidsurveys com/surveys/dfsc/cwpp-homeowner-survey/

DIABLO FIRESAFE COUNCIL

www.diablofiresafe.org

Alameda County
Community Wildfire Protection Plan
Overview

Tasks	Anticipated Timeframe	Outcome/ Results/ Deliverables
Step #1 Convene decision-makers (minimum local government, fire agencies and Cal Fire).	Thursday Feb 24, 2011	Project meeting #1 scope, schedule, potential stakeholders.
Step #2 Involve Federal Agencies (USFS, BLM, USFWS, NPS) to share perspectives, priorities and other information	Tuesday March 22 2011	Project meeting #2 prospectus, communication methods; outreach plan, existing information available
Step #3 Engage interested parties. Develop informational materials regarding process and stakeholder involvement. Post on web/ blog. Provide link to partners.	March May 2011	Outreach presentations (15) Educational materials
Step #4 Establish Community Base Map based on existing state and local assessments (identify inhabited areas, critical infrastructure, prelimary designation of communities' wildland urban interface zone)	March July 2011	Project Meeting #3 (May) Base Map. Preliminary community risk assessment map
Step #5 "Risk Assessment" Community Workshops (in 3 parts of county) to identify: Fuel hazards Risk of wildfire occurrence Homes, businesses and critical infrastructure at risk Other community values at risk Local preparedness and fire fighting capabilities	April July 20 1	Community Workshops # 3 (Jan July) Draft "Risk Assessment"
Step #6 "Risk recommendations & Priorities" Community Workshops. Establish "Community Hazard Reduction Priorities and Recommendations to Reduce Structure Ignitability.	July November 201	Project meeting # (August) Draft Priorities & Recommendations Educational materials Community Workshops #4 & (November)
Step #7 Develop Action Plan" and Assessment Strategy Identify roles, responsibilities, funding needs & timetables for highest priority projects. Establish assessment strategy for relevance and effectiveness over long term	December February 2012	Project meeting #5 (February) Draft Action Plan
Step #8 Finalize the "Community Wildfire Protection Plan and present for approvals Present adopted plan to community	March 20 2 May 20 2	Project meeting 6 (March) Administrative Draft Plan Public Draft Plan Presentations to adopting bodies (public meetings) Fin Pro

State, local and private agencies, companies, organizations and special interest groups, as well as the residents of Alameda County participated in the development and review of this CWPP Stakeholders included

Alameda County Fire Department
Alameda Master Gardeners
American Red Cross
Association of Bay Area Governments
Berkeley Fire Department
CAL FIRE – Santa Clara Unit
California Department of Fish and Game, Habitat Conservation Unit
California Native Plant Society
Claremont Canyon Conservancy
Diablo Fire Safe Council
East Bay Municipal Utility District
East Bay Regional Park District
Fremont Fire Department
Friends of Sausal Creek
Garber Park Stewards
Hayward Fire Department
Hills Emergency Forum
Lawrence Berkeley National Laboratory
Merritt College/ Peralta Community College
National Park Service
Natural Hazard Mitigation and Recovery Consultant
Oakland Fire Department
Oakland Local – News and Community Voices
Oakland, Mayor's Office
Oakland Wildfire Prevention Assessment District Advisory Committee
Pacific Gas and Electric
Piedmont Fire Department
Shepherd Canyon Eco-pullers
Society of Fire Protection Engineers
University of California, Richmond Field Station
University of California, Berkeley
U S Fish and Wildlife Service Pacific Southwest Region Fire Management

Fire Hazard and Risk in the Wildland Urban Interface

2 1 Fire Environment

Wildfires are a part of Alameda County's natural ecosystem The Mediterranean-like climate with no summer rains, the rugged, wind-conducive topography, and fire adapted native vegetation set the stage for periodic burns The fire environment is made more dangerous by the abundant hazards and risk associated with a growing population and sprawling pattern of development The urban side of the wildland-urban interface brings new hazards into the equation with introduced vegetation, structures constructed of flammable materials and many potential ignition sources

Alameda County has a history of fire over the past 100 years resulting in loss of lives, property and natural resources – the 1991 "Tunnel Fire" in the Berkeley Oakland Hills being the most damaging Historically, more frequent wildfires of lesser intensity were common Drought and human behaviors, particularly in the arenas of land-use and fire suppression, have had a profound impact on the County's fuel complex and fire regime This increases the possibility of catastrophic wildfire, especially as the hazards of vegetation, topography, structures and fire weather are present

Weather

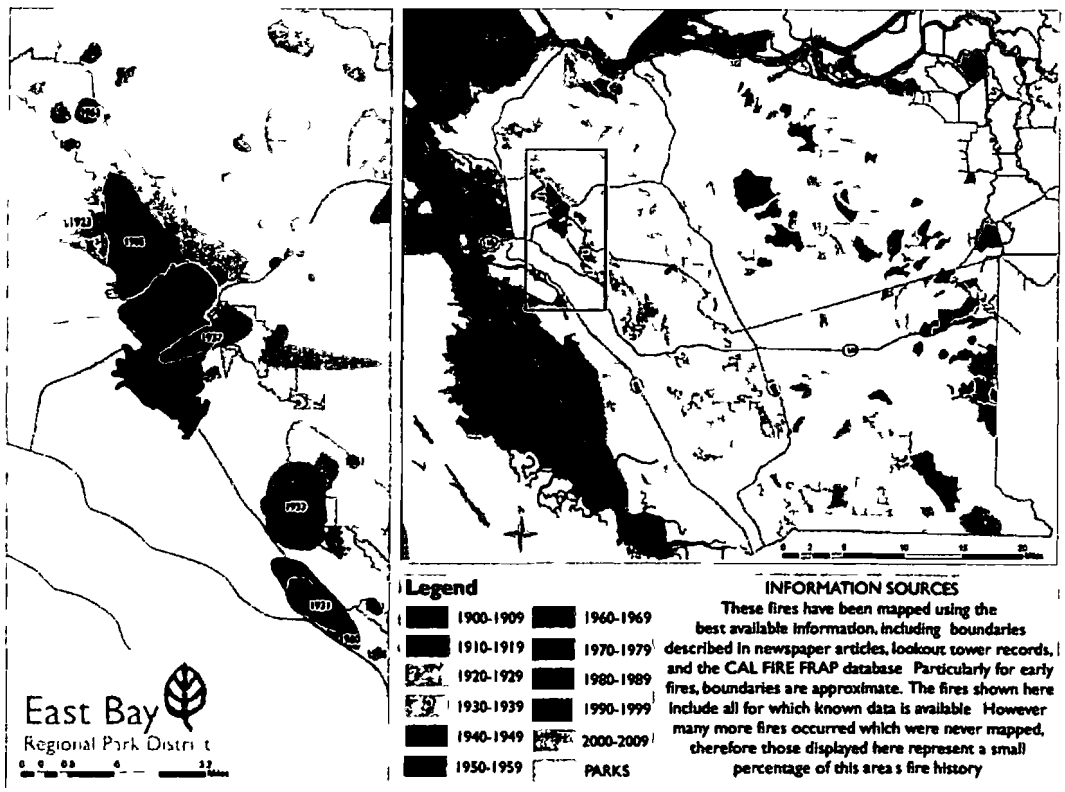
Chief among fire hazards is the area weather Despite efforts to improve neighborhood safety and fire fighting capability, uncontrollable fire storms will occur under the extreme, but periodic conditions of "Red Flag" weather days "Red Flag" warnings are issued by the National Weather Service when weather elements such as low relative humidity and strong winds could lead to rapid increases in wildfire activity

In Alameda County, "Red Flag" weather can mean the occurrence of strong, hot, dry offshore winds (technically called "foehn" winds) These winds are known locally as "Diablo Winds" since they come from the north, northeast in the direction of Mount Diablo They carry extremely dry air at high velocity They quickly desiccate vegetation and other flammable materials and can push a fire down or up a slope with amazing speed These can occur at any time of year, but are especially dangerous in the driest months of summer and fall During these times, fighting a fire becomes far more difficult

Fuel – Structures and Vegetation

Due to homes continuing to be built in high fire hazard zones and changes in the natural fire-cycle, the county has areas of highly flammable structures amongst an over-accumulation of flammable vegetation This massive fuel load in the area's mountains and hills makes fires very difficult to contain In addition, non-native and invasive weedy vegetation has replaced the more fire resistive and ecologically stable native species in many places, adding to the threat

Fire History in the East Bay



15 Major Fires In Berkeley Oakland Area

September 1923 Berkeley / North of UC Berkeley campus 584 homes destroyed and 130 acres Diablo wind Ignition smoker

June 1929 – Oakland/ Lake Temescal 300 acres grassland West wind burned from Lake Temescal toward Skyline Boulevard and Tunnel Road (Source Berkeley Daily Gazette June 22 1929) Ignition unknown

November 1931 Leona 5 homes destroyed and 1800 acres burned Diablo wind Ignition unknown

November 1933 Redwood / Joaquin Miller 1 life 5 homes and 1000 acres Diablo wind Ignition smoker

September 1937 Broadway Terrace 4 homes 700 acres West wind Ignition Backyard fire

September 1940 Broadway Terrace 30 acres West wind Ignition unknown

September 1946 Buckingham/ Norfolk 1 000 acres Diablo wind Ignition arson & rekindle

November 1955 Montclair 10 acres West wind Ignition unknown

October 1960 Leona 2 homes 1200 acres Diablo wind Ignition unknown

November 1961 Tilden Briones Roberts & Chabot 4 fires 400 acres South west wind Ignition arson

October 1968 Oak knoll 204 acres West wind Ignition unknown

September 1970 Buckingham/Norfolk 37 homes destroyed 21 homes damaged 204 acres Diablo wind Ignition arson

December 1980 - Berkeley/ Wildcat 5 homes 2 acres Diablo wind Ignition power line

October 1990 Leona 200 acres West wind Ignition vehicle accident

October 1991 Buckingham/Norfolk (Tunnel Fire) 25 lives 3354 homes 456 apartments 1600 acres estimated $1 5 billion damages Diablo wind Ignition rekindle

Topography

The County's steep topography, with canyons and swales, influences fire behavior and in many instances intensifies fire effects Westward facing slopes are more arid (due to long exposure to the afternoon sun) and thus more combustible The difficulty of building roads in the steep areas makes ingress or egress difficult and delays fire fighter response time

2 2 Wildland Urban Interface Risk & Hazard Assessments

The wildland urban interface (WUI) is defined as an area in which wildlands and communities are sufficiently close to each other to present a credible risk of fire spreading from one to the other Nationally, the WUI has gained increasing importance as more Americans build homes in rural settings adjacent to public lands

The housing density and geography of Alameda County is such that most of the developed areas not only border WUI areas, but also include conditions within the "urbanized" areas that can fuel wildfires, such as experienced in the 1991 fire in the Oakland-Berkeley Hills (officially known as the Tunnel Fire) Some locations are considered "Very High" and "High" Fire Hazard Severity Zones and are at significant risk for loss of life and property if a fire were to occur on a normal or extreme weather day

For the purposes of this plan, the California Department of Forestry and Fire Protection (CAL FIRE) Fire Hazard Severity maps were used as a starting point to determine where significant fire hazards exits both in the wildland and urban areas of the county Many local cities and fire districts have developed specific maps characterizing the risk in their areas, further refining the CAL FIRE maps These local maps are included in the Appendix

The California State Forester has identified communities in the WUI that are at significant risk from wildfire In accordance with the Healthy Forest Restoration Act, stakeholders elected to extend the definition of WUI to include evacuation routes, staging areas and other important resources and infrastructure This extended area is referred to as the "CWPP WUI" area on the Fire Hazard Severity map in the Appendix

Existing risk and hazard assessments can be grouped into three categories addressing potential for fire to occur, what to protect and protection capabilities

2 2 1 Potential for Fire to Occur

Factor 1 – Risk of Fire Occurrence

Fire History Locations

Alameda County has a history of fire, the 'Tunnel Fire" in 1991 in the Oakland and Berkeley Hills above the Caldecott Tunnel being the most damaging The *Fire History in the East Bay* shows many fires throughout the county over the past century Three areas show clusters of fire

1) East Bay Hills – Berkeley, Oakland, San Leandro,
2) East part of county along 580,
3) Southeast in remote areas of the county

Fire History Patterns

A look at the 15 fires in the vicinity of the Caldecott Tunnel from 1923 – 1991 shows a common pattern of ignitions during critical Diablo Wind conditions in the Fall, occurring every 10 – 20 years

Cause of Fire

As a part of their fire management plan, East Bay Municipal Utilities District (EBMUD) looked at causative agents for fires on their watershed from 1980-1997 Many ignitions were "unknown," but known causes were primarily human and included arson, camp and picnic activities, powerlines, fireworks, fuel reduction activities, smoking, children, auto, rekindles With only 2 out of the 174 fires analyzed caused by lighting EBMUD used this information to help identify high fire risk areas including

- All interface or intermix areas
- High use or recreational areas
- High travel transportation corridors with roadside grasslands

East Bay Regional Park District did a similar analysis of 1,900 fires over twelve years in Alameda and Contra Costa Counties and reached similar conclusions Stakeholders and fire personnel familiar with Alameda County's fire history felt that these causes and patterns could be extrapolated to other areas Alameda County also has a unique ignition source in the equipment associated with the wind farms in the eastern hills of the county The wind farm operators are required to submit wildfire management plans to local fire jurisdictions to address potential ignition risks

Fire Weather

Another factor that has been assessed is fire weather or periods of "Diablo winds" from the east that bring low relative humidity and higher temperatures Alameda and Contra Costa Counties have 11 remote automated weather stations (RAWS) that provide us localized information on the weather Many fire departments also take local weather readings to supplement these regional data In addition, National Oceanic and Atmospheric Association's National Weather Service provides "red flag warnings" and "Fire Weather Watch" of periods of high fire danger www wrh noaa gov/firewx/cafw/

Communities at Risk

In association with the development of the National Fire Plan the Federal Register published a list of Communities at Risk in 2001 [1] Eleven cities in Alameda County were identified This list provided a starting point to identify high priority areas

West County	East County
Incorporated Cities	(Tri Valley)
Berkeley	*Incorporated Cities*
Fremont	Dublin
Hayward	Livermore
Oakland	Pleasanton
San Leandro	
Union City	
Unincorporated Areas	
Fairview	
Castro Valley	

[1] www cafirealliance org/communities at risk/communities at risk list accessed 12/7/2011

Factor 2 – Fuel Hazards

CAL FIRE Statewide Hazard Assessment Maps

Very High Fire Hazard Severity Zones for State Responsibility Areas (SRA) and Local Responsibility Areas (LRA) are identified on these maps based on

- Flame length modeled based on vegetation, topography and weather
- Crown fire potential, ember production and ember movement
- Likelihood of burning based on fire history and other factors

See www fire ca gov/fire_prevention/downloads/FHSZ_model_primer pdf for more information on the model used to create these maps

In Alameda County "Very High Fire Hazard" Severity Zones are clustered in three areas in State Responsibility Areas (SRA)

- East Bay Hills from Berkeley south through the Castro Valley Hills,
- Hayward Hills connecting with Union City- Fremont hills, Pleasanton Ridge including Kilcare Wood, Palomares and Niles Canyon
- East County including wind generating area of Altamont Hills and Mines Road drainages Del Valle recreation area

Very High Fire Hazard Severity Zones in Local Responsibility Areas (LRA) include

West County	East County (Tri Valley)
Incorporated Cities	*Incorporated Cities*
Berkeley	Pleasanton
Piedmont	*Unincorporated Areas*
Oakland	Sunol
San Leandro	Scotts Corner
Unincorporated Areas	Kilcare Woods
Castro Valley	

Local Fire Hazard Assessments

More detailed local wildfire hazard assessments have been done in some areas of the county, such as for the *"East Bay Regional Park District's Wildfire Hazard Reduction and Resource Management Plan "* This plan for portions of the East Bay hills identifies vegetation and modeled potential fire behavior (using the model FLAMMAP) The plan identifies treatment areas located within 200' of homes with flame length greater than 8 feet, high potential for torching and spotting (ember production) or strategic fire route or safety zone, or areas that are currently maintained that would have flame length greater than 8 feet if not maintained

2 2 2 What to Protect

Factor 3 – Homes, businesses and critical infrastructure to protect

In addition to looking at fuel hazards it is also important to identify things that should be protected from the hazards Some of the things to protect include

- Homes and businesses
- Schools and colleges Alameda County includes many public and private schools, community colleges, private colleges, public colleges and universities

- Hospitals and other health related facilities
- Watersheds The San Francisco Water Alameda Watershed Plan (in Sunol) around Calaveras and San Antonio reservoirs identified areas of potential high fire severity on watershed EBMUD also has identified their watersheds' potential for wildfire
- Other things to consider Transportation and utilities Alameda County is seismically active with three major faults (Hayward, Calaveras and Greenville) that could impact access, reliability of water supply and result in potential ignitions from gas or fuel lines following a earthquake

In recognition of things to protect several cities have locally designated areas that further refine CAL Fire's very high fire hazard severity zones

- Both Berkeley and Oakland have special requirements for property owners to maintain defensible space They also send out annual notices and inspect properties in this area
- Fremont, Dublin and Hayward have special requirements for new construction in specific area, as well as inspections to maintain defensible space
- In 2005 Berkeley received a FEMA grant for an even more detail assessment of Fire Risk They looked at 5 categories of factors and rated each home individually Results can be viewed at map ci berkeley ca us/home fire risk/

Factor 4 - Other values to protect

Critical wildlife habitat

The East Alameda County Conservation Strategy identifies critical habitat in the eastern part of the county US Fish and Wildlife Service have identified critical habitat for the Alameda Whipsnake and Red Legged Frog Other federal listed species are identified in the "*Best Management Practices Guidebook for Hazardous Fuels Treatments in Contra Costa County - Alameda County Supplement*" (to be developed in conjunction with this CWPP) and the *Vegetation Management Almanac for the East Bay Hills*

Local watersheds, creeks and riparian areas

Many cities and the county have recognized the importance of their local watersheds, creeks and riparian areas and have local stream protection ordinances and regulations to protect these resources State regulatory agencies, including California Fish and Game and the San Francisco Bay Regional Water Quality Control Board (SFRWQCB), oversee protection of riparian areas, including along seasonal or ephemeral channels and issue permits required for removal of riparian vegetation Replanting or revegetation may be required in some areas when vegetation is removed to reduce wildfire hazards

There are also multiple water providers in Alameda County East Bay Municipal Utility District owns watershed lands around San Leandro Reservoir and Lake Chabot (managed by East Bay Regional Park District) San Francisco Public Utilities Commission owns watershed land around Calaveras and San Antonio reservoirs

Significant recreation, scenic areas and areas of historical, economic or cultural value

The wildland urban interface also contains many regional parks and city owned open spaces with significant recreation and scenic areas It also is the location of areas with historical, economic and cultural value both as documented historical and undocumented archeological sites

2 2 3 Protection Capabilities

Factor 5 - Local Preparedness and Fire Fighting Capabilities

Local preparedness and firefighting capabilities include community preparedness & emergency personnel response For example, the City of Pleasanton not only identifies "Special Fire Protection" areas, but also identifies areas outside of its response zones and requires new development includes sprinklers, special construction etc to respond to these conditions

2 3 Values at Risk within the WUI

Millions of people are exposed to the destructive forces of wildfire by virtue of living, working or visiting areas in the WUI Much of what people value most highly – their lives, family, community, property, as well as cultural, economic and ecological interests, is at risk of loss in an uncontrollable wildfire Of particular concern are those who for what ever reason would not be able to leave during an evacuation without assistance

Area residents and agencies list homes, businesses, parklands and protected watersheds among values at risk Regional facilities for public transportation (BART, rail and bus) are at risk, as are power and water supply facilities and substations, and in the Altamont area wind-power generation facilities The results of a survey about values at risks are provided to numerous residents are included in the Appendix

The County's Local Hazard Mitigation Plan[2] lists the following assets, with a total monetary value measured in billions of dollars, as exposed to potential loss

- In the urban lands of Alameda County, 77,727 (43 2% of the 180,056 acres in urban land use) are located in the wildland urban interface threat areas 21,963 of those acres of land (12 2%) are subject to high, very high or extreme wildfire threat
- In the non-urban areas of Alameda County, 14,697 acres (5% of the 289,956 acres) are located in the wildland urban interface threat areas Most non-urban areas are located in the more remote areas (outside of the WUI) In these remote areas there are additional areas of high or very high wildfire threat (221,826 acres of the 237,088 non-urban lands)
- 1,449 miles of roadway are subject to high, very high or extreme wildfire threat and 2,392 miles of roads are located in wildland urban interface threat areas (There are a total of 5,444 miles of roads in the County) Other critical regional transit facilities within the threat area include the Altamont Commuter Express (ACE Train), AMTRAK, Bay Area Rapid Transit (BART) and railroads
- Other infrastructure located within the wildland urban interface threat areas includes pipelines under roadways, power facilities, municipal wastewater facilities, municipal water supplies and communications facilities

---

[2] Association of Bay Area Governments Multi Jurisdictional Local Hazard Mitigation Plan Appendix C Natural Hazard Assessment Risk Assessment 2010 Update http //quake.abag ca gov/wildfires/ accessed 12/5/2011 See http //quake abag ca gov/mitigation/landuse/ for data specifics by county and city For Draft Alameda County Plan 2011 see http //quake abag ca gov/wp content/documents/2010LHMP/AlamedaCo Annex 2011 pdf accessed 12/5/2011

- 6 schools, 146 critical facilities (owned by city, county or special districts), and 71 bridges and interchanges are located in areas of high or very high threat 82 critical health care facilities, 249 schools and 1,044 other critical facilities are located in wildland urban interface threat areas

2 4 Strategies for Reducing Risk within the WUI

Wildfire is a natural process in the Alameda County ecosystem The natural hazards of the fire environment – weather, climate, topography and fire adaptive vegetation all are immutable Attention to decreasing the human impacts and risk factors can reduce the incidence of catastrophic wildfire These strategies are organized to focus on each of the existing risk and hazard assessments

1 Collaborative Partners Recommendations related to risk of fire occurrence include working with potential collaborative partners to share ideas including volunteer groups such as Garber Park Stewards, Shepherd Canyon, Beaconsfield and Claremont Canyon Conservancy, or less obvious partners such as neighborhood crime prevention councils (NCPC) Collaborative efforts may include

   - Information
   - Education
   - Collaborative planning on a local level with more detailed assessments and project development to reduce risk of fire occurrence

   Other information dissemination partners may include the media, mayors' office, local politicians, homeowner associations, organizations (California Native Plant Society, Rotary Clubs, Garden Clubs), packages for new homeowners (with local realtors), local businesses, or use of social media Electronic distribution could allow groups to customize and distribute through existing networks

   While information is best received by trusted known sources such as neighbors and friends, it is important to have support of official resources such as fire agencies and university researchers to answer follow up questions

2 Recommendations to address risk of ignitions

   - Fire Prevention Education – Smokey Bear, CERT, volunteers in prevention, fire department staff
   - Enforcement – supporting fire investigations and working with law enforcement, defensible space inspections/ enforcement
   - Engineering – equipment safety, fuel reduction activities

3 Recommendations to address fire weather

   - Awareness of hazard conditions – red flag program flags, education, shared responsibility of agencies and residents
   - Restrictions on specific uses, certain activities, specific operations or equipment (abatement work) during periods of high fire danger weather
   - Shared responsibility – patrols, community watch type activities

4 Recommendations to address community at risk hazards.

- Reducing surrounding fuels and ignitability of existing homes and structures – from the house out
- Focus on dense vegetation directly adjacent to homes and homes themselves
- Weed abatement defensible space inspections and enforcement
- Home ignition zone improvements (beyond weed abatement or fire code requirements)
- Reduce structure ignitability

5 Recommendations to further support defensible space programs

- Volunteer activities in community open spaces
- Chipping programs
- Green waste pickup or other programs for disposal
- Hazardous tree programs
- "Seed" funding for community projects
- Information such as lists of contractors and what sorts of work they can do Use CERT and contractor training programs as a model for programs where they provide certificates to contractors for credibility
- Inspection and enforcement mechanisms Note Not all cities and parts of Alameda County have mandated inspections or enforcement mechanisms, they vary by jurisdiction In many areas fire department staffing limits the program to complaint response and restricts inspections to what can be viewed from the public streets Code enforcement may be through neighborhood preservation, weed abatement or blight related ordinances
- Removal of penalties if work is completed within a certain timeframe (for those agencies that have the enforcement mechanism to use liens and penalties to require private property owners to comply with regulations)
- Partnering with insurance companies Insurance companies can be a big motivator – not insuring or increasing costs can motivate homeowners to take action Insurance companies also have incentive as it is better for them to prevent fire than to have to pay for replacement Residents more likely to pay attention to messages if they also come from insurance companies
- Showcase successful treatments of private properties where habitat values, aesthetics and fuel reduction (defensible space) goals have been met with an on-line photo gallery and details of treatment

6 Recommendations for Homeowner Risk Reduction Behaviors (Source. Firesafe Council of California website. www.firesafecouncil org)

- Creating a minimum 30-foot defensible space around your home
- Planting low-growing, fire resistant plants around your home
- Putting a fire resistant roof on your home
- Putting fire resistant undersides to any decks and balconies on your home
- Removing any dead branches from your home's roof and around the chimney

- Making sure that your home is easily identifiable and accessibly from a main road
- Making sure that all the trees on or near your property are away from structures
- Making sure that all the trees on or near your property are away from utility lines
- Working with neighbors to clear common areas and prune areas of heavy vegetation
- Stacking firewood and scrap wood piles at least 30 feet from any structure
- Contacting your local fire department to get a personal fire safety inspection at your home and property

7 Recommendations to support improving structure survivability

- Local building standards for remodeling reflective of the State adopted WUI Chapter 7A or better (recognizing these are minimum standards)
- Education regarding WUI building standards and existing code requirements - Class A roofs, smoke detectors, fire extinguishers, street address numbers Educational materials to address inside the home, external shell, ember hardening and non-ignition zone Use variety of outreach tools including DVD, website, flyers and presentations Provide targeted materials for homeowners in existing homes
- Showcase retrofit techniques and building materials for roofs, gutters, windows, siding, vents, decks, outbuildings Especially information regarding what can be done without major remodels Insurance Institute for Business and Home Safety has a good retrofit checklist with relative costs
  www disastersafety org/content/data/file/WF_checklist pdf
- Incentive programs to finance upgrade of existing homes
  - Community based Malibu West FireSafe Council has a program for wholesale purchase and installation of materials such as fire safe vents
  - State legislative including incentives for home energy efficiency (upgrade to double pane windows also increases structure survivability for wildfire)

8 Recommendations to support appropriate new development & construction both in new subdivisions and as infill in existing communities

- Integrate fire safety into local policies
- WUI building standard (State Chapter 7A or more stringent) - Roofs, Gutters, Windows, Siding, Vents, Decks, Other Educational materials to designers, builders, plan checkers and code officials to address inside the home, external shell, ember hardening and non-ignition zone Use variety of outreach tools including DVD, website, flyers and presentations
- Local building requirements for fire sprinklers
- Review of infrastructure design - roads (access for evacuation and emergency equipment), bridges, water, underground utilities, fire stations This is especially important where development occurs on previously un-buildable lots where existing infrastructure may not be adequate for protection of new development
- Mechanisms for fuel reduction in community open space (privately or jointly owned)

- Provide education and tools to planning commissions to allow them to be more selective in their approval of appropriate new construction in very high fire hazard zones

8 Recommendations to support fuel management on public and large scale private lands

- Integrating fire with scientifically based resource and vegetation management that protects and improves native habitat values A lot of collaborative planning work has been done in the region that should be incorporated Balance protection of biological resources with fuel removal
- Share project implementation resources (contractors, equipment, specifications)
- Share best management practices (BMP) and lessons learned
- Project & funding support
- Facilitate a process that permits volunteers to "adopt a park" for fuel management work, including revegetation of desirable species, such as with Garber Park Stewards or Claremont Canyon Conservancy
- Work with local ranchers and public agencies who use cattle grazing as a tool for fire management to encourage them to adjust range management plans and graze closer to roads and fence lines to reduce ignition potential early in the season
- Include botanical and biological experts in planning and oversight of projects to maximize effectiveness while minimizing negative impacts

9 Recommendations protecting homes, businesses, other facilities & essential infrastructure at risk

- Expand structure ignition reduction and defensible space activities to businesses and essential infrastructure
- Identify fuel reduction projects to protect transportation networks and utilities, such as watershed fuel reduction, roadside clearances, and power-line clearance Power lines that do not follow roads may be a special concern, as it is difficult to get fire suppression equipment into the area if there is an ignition

10 Recommendations to support Local Preparedness and Firefighting Capability

- Develop local evacuation plans and educate residents on preparedness Alameda County Fire Department is working on evacuation plans for local areas
- Identify actions to maintain existing access/ egress during Red Flag days by reducing restrictions of road right of ways on narrow roads throughout the hills
- Participate in and enhance existing CERT/ Neighborhood Watch programs
- Continue to support fire department response improvements mutual aid, wildland fire training, equipment etc

Recommended Action Plan

3 1 Selection of Recommended Priorities

The Alameda County Community Wildfire Protection Plan (CWPP) was developed through collaboration of stakeholders and residents that attended work sessions, public presentations or commented on draft versions of this plan Participants were invited to submit project ideas that provide protection and reduce risk The following recommended priorities are based on this collaboration, as well as the analysis and the recommended strategies for reducing the risk with the WUI detailed in Chapters 1 and 2

Each of the following topics outlines specific recommendations and associated actions It is anticipated that additional opportunities for actions will be identified as the CWPP is implemented Projects, workshops, demonstrations and education efforts will be recommended for implementation and funding based on the following attributes

- Protects life, property and infrastructure in areas of the County where risk of catastrophic wildfire is most severe
- Reduces risk of fire spreading from private lands to regional parklands, state or federal lands or areas where significant natural or cultural resources are at risk
- Seeks to create a detailed implementation plan for fire prevention or mitigation at the local level in an area identified as "at risk"
- Involves stakeholders at all levels, which is to say there is strong community support, as well as support from applicable agencies and landowners Intensity of local support will be a significant factor when choosing projects
- Demonstrates the capacity to continue to manage and maintain the project effectively, and/or supports ongoing, previously planned efforts
- Projects covered in an agency adopted environmental document (Note Some stakeholders felt that grants should not be processed for work that is not covered by required environmental document(s) or for projects where required permits are not obtainable However, it also should be noted that some grants cover the environmental planning and permitting process which can be quite costly and difficult to fund)
- Projects that will improve firefighting response, wildfire control capabilities and residential evacuation plans and operational programs
- Removal of invasive plants of known high flammability listed in a recognized source such Cal-IPC California Invasive Plant Inventory (publication 2006 02 or updated)

Many of the recommended actions will take long-term commitment over multiple years to address the complex hazards Some actions have current funding, but additional funding and efforts are needed to continue to address the issue

3 2 Information, Education and Collaborative Planning Priorities

A key recommendation related to information, education and collaborative planning is working with potential partners to find common ground, share ideas and develop joint implementation of local projects These partners may expand beyond the traditional agency partners to include volunteer groups such as the Garber Park Stewards, Shepherd Canyon, Beaconsfield and Claremont Canyon Conservancy who have interest in neighborhood or nearby open spaces They may also include organizations, such as the California Native Plant Society or Alameda County Master Gardeners, offices of the mayor or elected officials, homeowner associations or local businesses One such recommendation includes exploring partnerships to improve communication

Priority Action **Improve Communication with Messaging System**

Recommendation Use available technology to improve communication to residents (e g fire weather evacuations, CORE/CERT classes fireworks reminders and other information) Note This recommendation could addresses many activities listed under the Information, Education and Collaborative Planning category

Implementation Actions

- Use Oakland communication system as a model – Oakland Police Department utilizes the Nixle messaging system to send out information via email or to cell phones Check out potential to expand the type of information that goes out
- There may be other off the shelf communication systems in other parts of the county Look into partnering with California Highway Patrol to use Amber Alert for periods of red flag weather
- Promote service via listserves and other methods to get residents to sign up
- Link information to city twitter and government system accounts

Lead and Partners Oakland Wildfire Prevention District to send out information

Time frame Short timeframe to get up and running, ongoing to provide information and make residents aware of the system

Estimated Funding Need $ use existing system

Priority Action **Regionally Specific Educational Materials for Homeowner System**

Recommendation Develop simple homeowner education materials that are specific to the development patterns and conditions in Alameda County These should identify inexpensive things a homeowner can do Materials should be available in an increasing level of complexity from simple to more detailed and issue specific There should be an "index" to be able to look up specific information

Implementation Actions

- Focus on existing structures and how a homeowner can improve their home's ignition resistance Information should include non-ignition zone and how simple actions of cleaning leaves and not storing flammable materials below decks can reduce the potential of ignition from embers
- Ask if Sunset Magazine could develop guidelines on "bad plants" and how they should not be planted near windows
- Develop defensible space guidelines that look like the East Bay Hills and other places in Alameda County
- Develop guidelines for environmentally sensitive fuel reduction
- Develop guideline for vegetation management where erosion is an issue
- Develop plants specific information (e g rosemary or succulents)
- Promote existing guidelines such as the *Vegetation Almanac for East Bay Hills* published by the Hills Emergency Forum
- Other subjects could include how to prepare your home for an evacuation

Lead and Partners North Hills Community Association is a prototype for an effective channel for distributing this information

Time frame On going

Estimated Funding Need $ for development and distribution of materials

3 3 Enhanced Suppression Capability and Emergency Preparedness Priorities

Each year wildfires reinforce the importance of local emergency preparedness and evacuation plans The emergency service agencies (County Office of Emergency Services, County Sheriff, and local police and fire departments) of the cities and Alameda County are interconnected through mutual aid agreements and common training of the Incident Command System and National Incident Management System To expand this preparedness to a local and neighborhood level, many jurisdictions offer Citizen Emergency Response Training (CERT) programs Since these programs focus on multiple hazards and cover the entire county few offer wildfire preparedness or local evacuation in the event of wildfire One priority recommendation focuses on assisting in the development of local evacuation plans Another opportunity is to collaborate with updates to local hazard mitigation plan or general plan

safety elements

Another area of concern raised during the development of the plan related to the suppression difficulty of ignitions from powerlines when those utilities do not follow roads On July 25, 2006 a fire ignited from a downed power line in Tilden Park (near the ignition point of the historic 1923 Berkeley fire) While the firefighters were able to see the fire they had difficulty designating the area that had to be reached after a one-third mile hike through brush [1] Had a service road been along the power lines the ignition would likely to have been easily located

Priority Action Evacuation Planning

Recommendation Collaborate with other organizations (e g Red Cross, CERT, CORE, Neighborhood Watch) to assist community groups develop neighborhood evacuation plans

Implementation Actions

- Focus on community groups and block level
- Identify essential supplies to maintain (Go Pack)
- Identify special populations or needs at the block level
- Identify primary and secondary evacuation routes
- Coordinate with CORE/ CERT members
- Pre designate suitable evacuation shelters
- Physical improvements to the routes as needed (shoulders, parking restrictions, vegetation clearance, signage etc)
- Tie to general education of wildland urban interface issues, red flag warnings

Lead and Partners Coordinate with other groups that address evacuation training such as CORE/ CERT and Red Cross, as well as outreach to home owner associations, fire departments, police departments

Time frame Short to identify, medium to long term to implement improvements

Estimated Funding Need $ for maps and brochures, $$$$$ for physical improvements

[1] Brenneman Richard "Fire Department Log The Daily Planet Weekend Edition July 28 31 2006

Prioritizing Fuel Reduction Treatments

4 1 Fuel Management

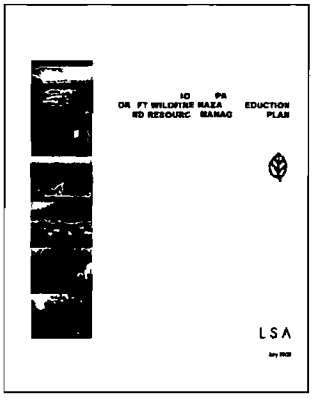
Fuel management, ideally a subset of sound vegetation and ecosystem management, is the practice of removing or modifying vegetation in order to reduce wildfire ignitions, rate of spread and intensity Fuel management requirements depend on the vegetation type, location, condition and configuration Given the dynamic nature of these fuels, a single treatment type or prescription is not effective Follow up is often needed to avoid encroachment by weedy, non-native invasive species Rigorous oversight, active management and an adaptive approach are required to achieve fuel management goals with a positive by-product of ecosystem improvement

Generally five fuel management methods are available and used within the WUI

- Manual (hand labor such as pulling or cutting)
- Mechanical treatment (equipment used for mowing, selective cutting of trees, masticating or crushing)
- Prescribed herbivory (targeted grazing by sheep, goats or cattle)
- Chemical treatment
- Prescribed fire

Specific fuel management treatment goals and methods are addressed more fully in the *Best Management Practices Guidebook for Hazardous Fuel Treatments in Contra Costa County* and the *Vegetation Almanac for the East Bay Hills* Diablo Fire Safe Council will seek funding to prepare a *Best Management Practices for Fuel Treatments Alameda County Supplement* These best management practice guidebooks for both Contra Costa and Alameda Counties will continue to be refined based on environmental compliance documents, adaptive management practices and other lessons learned by the various stakeholders

4 2 Fuel Reduction Treatments – Geographically Base Projects



Throughout Alameda County public and private agencies, fire departments and fire districts establish fuel reduction treatment priorities on a regular basis as a part of their long-range planning or annual budgeting procedures Many of the public land managers have detailed plans that incorporate fuel reduction treatments These plans have not only identified geographically based projects, but also have developed best management practices and mitigation measures that should be incorporated into projects to reduce the impact of fuel reduction treatments on the environment (see on-line Appendix for further resources and references)

- East Bay Hills Wildfire Hazard Reduction and Resource Management Plan and EIR East Bay Regional Park District
- East Bay Watershed Management Plan East Bay Municipal

Utilities District
- Alameda Watershed Management Plan San Francisco Public Utilities Commission
- Albany Hill Creekside Master Plan City of Albany
- Long Range Development Plan and EIR Lawrence Berkeley National Laboratory
- Long Range Development Plan and EIR University of California, Berkeley

Typically, fuel treatment is done around structures, by roadways and in areas of extreme fire behavior Treatments addressed in the *Best Management Practices Guidebook for Hazardous Fuel Treatments in Contra Costa County* are organized by zone as follows

- *"From the Home 0-30', 30-100'*
- *"Critical Infrastructure 0-300'*
- *"Emergency Access Roads 0-30', 30-100'*
- *"Community Protection 100-300'*
- *"Community Wildland Interface 1 5 miles area around a community unless otherwise designated "* (page 7)

Stakeholders in Alameda County have further refined this list with the following areas as appropriate for fuel management

- Areas within 200 feet of homes in the wildland urban interface (WUI) with excessively flammable vegetation that would produce greater than 8 foot flame lengths
- Areas within 200 feet of high-value or irreplaceable public facilities in the WUI with excessively flammable vegetation that would produce greater than 8 foot flame lengths
- Areas within 30 foot to 100 foot of private residences in the WUI with excessively flammable vegetation that would exceed state or local defensible space codes
- Areas with excessively flammable vegetation due to extreme amounts of litter or ground fuel levels These may be areas where ground fuels exceed six-inches deep with occasional jackpots of fine material up to three-inch diameter It may be with greater than two to six tons per acre with ribbon bark and understory fuel ladders in identified high risk forest like eucalyptus or Monterey pine that are subject to torching and crown fires with potential high ember flight rates into residential areas
- Areas critical to strategic fire fighting operations in the event of a wildfire with excessively flammable vegetation
- Areas with excessively flammable vegetation within 30 feet of wildfire evacuation and fire fighting access along paved roads and strategic fire trails
- Areas of invasive plants that will increase the flammability of adjacent natural plant communities or displace more fire safe and fire adapted native species

The list of current geographically based priority projects follow this discussion An intended outcome of the CWPP process is for this list to be updated annually to ensure that efforts are coordinated whenever possible

When funding is available, fuel reduction treatment projects with the following attributes should be given the highest priority

- Project reduces hazardous fuels that, if left untreated, would generate high intensity burning adjacent to structures or communities at risk, or produce large

quantities of airborne burning embers that would carry into communities or other important resources

- Project reduces hazards along strategic emergency access and evacuation routes, or other critical infrastructure

- Project includes vegetation modification treatments that will reduce the threat of unacceptable impacts of high intensity fire to high value ecosystems, sensitive watersheds and high concentration recreation areas, including regional parklands and state or federal lands Projects to include strategies and funding for on-going maintenance, especially follow-up management of non-native invasive species that could create hazardous fire conditions

4 3 Fuel Reduction Treatments Balanced with Resource Management

A number of the Alameda County CWPP stakeholders recommend vegetation management actions balance three factors wildfire risk reduction, resource management and cost-effectiveness of projects over the lifetime of their implementation Successful long-term wildfire risk reduction and resource management of the above zones must balance economic factors with the effectiveness of selected treatment methods, it is critical that selected cost-effective treatments be sustainable over the long-term

A key premise of several organizations' support of the Alameda County Community Wildfire Protection Plan is that ecologically stable habitats are ultimately more economically sustainable In effect, managing vegetation to achieve plant and animal communities and habitats with high levels of bio-diversity but inherently low fire hazards is more effective over the long term than the occasional treatment and/or ongoing maintenance of high fire hazard vegetation A number of the stakeholders feel strongly, that fuel reduction treatments should promote the recovery, restoration, and enhancement of native habitat

Other members, such as Fire Departments or Fire Agencies, that participated in the development of this CWPP have jurisdiction over urban areas and do not have resource management or restoration goals beyond those required by local, state and federal laws Several of these agencies support the desire for cost effectiveness of projects over the lifetime of implementation for wildfire risk reduction So there is common ground that can be found within the multiple individual agency guiding missions

4 4 Environmental Review and Permitting

Some stakeholders have requested that an Environmental Impact Report (EIR) be prepared for the Alameda County Community Wildfire Protection Plan Many of the land managing agencies have already completed their California Environmental Quality Act (CEQA) compliance (as listed in section 4 2) and a FEMA led National Environmental Policy Act (NEPA) review for multiple FEMA grants in the region is on-going in the Spring of 2012

The Alameda County Community Protection Plan is an advisory document that was prepared by the Diablo Fire Safe Council in collaboration with public agencies and other interested stakeholders pursuant to the Healthy Forests Restoration Act The committee was comprised of stakeholders (or their representatives) living in at-risk communities, and the contents of this CWPP are opinions of these stakeholders following the procedures outlined

In The Wildland Fire Leadership Council's handbook, "*Preparing a Community Wildfire Protection Plan, A Handbook for Wildland Urban Interface Communities* " More specifically, landscape and fire science discussions, WUI designation, priority of at-risk communities, regulatory interpretation and other discussions set forth in this CWPP are findings and recommendations by these stakeholders to help protect their communities from wildfires Because this CWPP is an advisory document, the CWPP does not legally commit any public agency to a specific course of action or conduct and thus, is not a project subject to CEQA or NEPA At least twelve counties in California have signed CWPPs without considering the CWPP as a project subject to CEQA

However, if and once funding is received from local, state or federal agencies and prior to work performed, or prior to issuance of discretionary permits or other entitlements by any public agencies to which CEQA or NEPA may apply, the lead agency must consider whether the proposed activity is a project under CEQA or NEPA If the lead agency makes a determination that the proposed activity is a project subject to CEQA or NEPA, the lead agency must perform environmental review

In addition to NEPA or CEQA it is recognized there are a number of permits that may need to be obtained prior to fuel reduction work including

- US Army Corps of Engineers Clean Water Act Section 404 or Rivers and Harbors Act Section 10 Nationwide Permit or Individual Permit
- US Fish and Wildlife Service or National Marine Fisheries Service Section 7 or Section 10 Consultation
- Regional Water Quality Control Board Clean Water Act Section 401 or Porter Cologne Act 401 Certification or Water Discharge Requirement
- California Department of Fish and Game Section 1600 Streambed Alteration Agreement, Fish and Game Code and California Endangered Species Act Streambed Alteration Agreement, CESA 2081 or CESA 2080 1 Permit

Other activities may not required specific agency permits, but may require additional review or specific mitigation measures to comply with

- Migratory Bird Treaty Act
- National Preservation Act (Advisory Council on Historic Preservation Section 106 review, State Historic Preservation Office)
- Bay Area Air Quality Management District Regulation 5 Open Burning
- County Agricultural Commission, CAL EPA and Federal EPA on use of herbicides
- Local tree preservation ordinances
- Local stream protection regulations
- Local noise ordinances
- City or county road encroachment

2012 Geographically Based
Fuels Reduction Projects and Prevention Strategies

Agency or Group	Project or Strategy	Status
Alameda County Fire Department	Annual weed abatement code enforcement	Ongoing Funded
Albany Fire Department & City of Albany	Annual weed abatement code enforcement and abatement in high hazard area	Ongoing Funded
	Albany Hill and Creekside Park Vegetation Management Plan	Plan adopted March 2012
Berkeley Fire Department & City of Berkeley	Annual weed abatement code enforcement and abatement in high hazard area	Ongoing Funded
CAL FIRE Santa Clara Ranger Unit	Technical support and personnel to allied agencies who are conducting projects in the SRA and LRA of Alameda County See Unit Plan Santa Clara County	Ongoing Funded
	Coordination of Fire Crews for project work	Ongoing Funded (limited availability)
Claremont Canyon Conservancy	Claremont Canyon Advocate Plan implementation	volunteers + capital campaign for funding
East Bay Regional Park District	FEMA EIS for Grant Funding for projects in Claremont Canyon Tilden Redwood Chabot Regional Parks	Ongoing Funded
	Project implementation in East Bay Hills See Wildfire Hazard Reduction and Resource Management Plan	Ongoing Funded
	High fire danger information use restrictions	Ongoing
East Bay Municipal Utility District	Grizzly Peak ridgetop fuel management	Ongoing Funded
	Livestock grazing for fuel reduction	Ongoing Funded
	Plowed control lines at strategic locations	Ongoing Funded
	Trail closures during periods of extreme fire hazard	Ongoing Funded
	Annual watershed fire road maintenance	Ongoing Funded
Diablo Fire Safe Council	Defensible Space Program seed fund for community projects	unfunded
	Contractor/ Landscape Designer Training Workshops	unfunded
	South Oakland Community Fuel Reduction	funded 2012
Fremont Fire Department & City of Fremont	1 Annual weed abatement code enforcement and abatement in high hazard area	Ongoing Funded
Garber Park Stewards	Garber Park Oakland vegetation management	volunteers unfunded
Hayward Fire Department	1 Annual weed abatement code enforcement and abatement in high hazard area	Ongoing Funded
	2 Ward Creek Canyon and other community fuel reduction projects in high fire area of Hayward Hills	Initial funding thru 5/2012

Agency or Group	Project or Strategy	Status
Lawrence Berkeley National Laboratory	Annual fuel reduction maintenance	Ongoing Funded
Livermore Area Parks and Recreation District & Livermore Pleasanton Fire Department	Use of prescribed fire for fuel reduction and resource enhancement	Ongoing
Oakland Fire Department and Oakland Wildfire Prevention District	1 Annual defensible space code enforcement and abatement of private property in wildfire prevention district	Ongoing Funded thru 2014
	2 City owned property defensible space abatement in wildfire prevention district	Ongoing Funded thru 2014
	3 FEMA EIS for Grant Funding for projects in Claremont Canyon	Ongoing Funded
North Oakland Hills Association	Aging trees that could fall across powerlines along major roads (Snake Skyline)	unfunded
	CalTrans propoerties along Highway 24 Caldecott Tunnel corridor including 4th Bore Mitigation Project South of Tunnel Broadway and East of north athletic field Hillside southwest of Hiller Drive south and east of Kaiser School North of Tunnel Road from exhibition eenter west to stoplight North of Highway 24 Caldecott Lane and Tunnel Road west of overpass South edge of Highway 24 Tunnel Road & Broadway both sides of overpass Landscaping of above areas	unfunded
	Vacant lots in Vicente Creek Canyon (near Strathmoor Grandview & Gravatz)	unfunded
	Swainland Reservoir fuel reduction South of Highway 24 below to Fairlane Dr	unfunded
	Roadside clearance Claremont Av	Funded thru 2014
	Roadside clearance Castle Drive and Skyline Drive	Funded thru 2014
	Roadside clearance Skyline Drive	Funded thru 2014
	Open space west of N Oakland Sports Field south of upper Broadway	unfunded
	Eucalyptus grove above N Oakland Sports Field service road	unfunded
	Eucalyptus trees north end of Highway 13	unfunded
	Open space east of Lake Temescal west of power station	unfunded
	Hillside Montclair Park	volunteers unfunded
	Montclair hills aging pine cypress and eucalyptus	unfunded
	Joaquin Miller Park	unfunded
Pacific Gas and Electric	High voltage distribution lines	Ongoing Funded
San Francisco PUC	1 Alameda Watershed Management Plan implementation San Antonio and Calaveras Reservoirs	???
University of California Berkeley	1 FEMA EIS for Grant Funding for projects in Claremont Canyon & Strawberry Canyon	Ongoing Funded

4 3 Fuel Reduction Treatments – Related Priorities

Priority Action Monitoring Forest Health

Recommendation Climate change, increase in pathogen and disease from urbanization (many are introduced by nursery plants), as well natural cycles are resulting in decline of forest health, especially in the East Bay Hills where many trees were planted in the early part of the 20th century Monitoring for forest health includes monitoring for diseases (sudden oak death, pine pitch canker, bark beetles), drought stress and the general decline due to aging

Implementation Actions

- Develop mapping program of disease outbreak and mortality with new mapping every 3 years to track changes
- Use remote sensing technologies to develop aerial photo imagery (perhaps LIDAR)
- Collaborate with UC Berkeley to store data for a continuous database (similar to Sudden Oak Death project)
- Provide for on the ground reports from agencies, homeowners, volunteers etc
- Sampling and measuring fuel loads such as in Eucalyptus groves would be helpful additional information
- Make products available to fire departments to pinpoint locations of higher risk

Lead and Partners No lead identified Collaborate with other monitoring programs such as Sudden Oak Death volunteer monitoring program www oakmapper org/

Time frame On going

Estimated Funding Need Funds needed for initial mapping, as well as updates

Priority Action Volunteer Projects on Public Lands

Recommendation Volunteer program to work on fuel treatments on public lands to reduce fuels (examples such as adopt a spot or right of entry agreements)

Implementation Actions

- Use existing programs as prototypes – Adopt a spot (Oakland), right of entry agreements (East Bay Regional Park with Diablo Fire Safe Council, Kensington neighbors and Claremont Canyon Conservancy), "Friends of "groups (e g Friends of Sausal Creek, Friends of Beaconsfield Canyon, Friends of Garber Park) other volunteer groups
- Existing non profit organizations have an easier time getting agreements
- Benefits include collaboration education, increased awareness of fuel work completed Fuel management to provide a place for firefighter to fight fire
- Risks include potential injury to volunteers, potential damage to environment if proper oversight is not provided (knowledge of what and how to manage vegetation)

Lead and Partners Community organizations neighborhood groups and land management agencies/ cities

Time frame On going

Estimated Funding Need $ No specific cost to agencies, but support of neighbor/ volunteer work force with incentives or grants is helpful

Priority Action **Balancing Fuel Load Management with Biological Resource Protection**

Recommendation Increase awareness of environmental sensitivities and permitting requirements throughout fuel management activities

Implementation Actions

- Identify what resources need to be protected - Riparian areas, native species, protected species
- Provide more information regarding environmental sensitivities This should include botanical expertise on projects, recruitment studies of native plants following fuel reduction treatments, habitat preservation, invasive species, managing, permitting and replanting
- Provide information on permits from California Department of Fish and Game and possibly Regional Water Quality Control Board for removal of riparian vegetation along seasonal or ephemeral creeks
- Widely disseminate information on appropriate timing of fuels treatment for best success relative to reducing the reproductive viability and survivability of invasive, non native species, while doing least harm to / improving native habitat values (see Vegetation Management Timing charts in Vegetation Almanac for the East Bay Hills for example)
- Disseminate information from Green Paper prepared by Sierra Club, Native Plant Society and Audubon Society in 2009 and other documents
  - The Beaconsfield model was offered as a prototype to look at
  - Create a data base and photo gallery of Alameda County fuels/ vegetation management projects (successes and failures) with initial treatment + follow up maintenance
- Vegetation mapping database for urban side of wildland-urban interface

Lead and Partners None identified

Time frame On-going

Estimated Funding Need Not identified

Treatment of Structural Ignitabilty

5 1 Structural Ignitability Factors

The presence of structures within the WUI exposes both the natural and developed environment to increased risk of destruction by wildfire In areas where the accumulation of flammable vegetation coexists with residential development, an ignition can lead to catastrophic fire Mitigation of hazards that contribute to ignitability can reduce the potential of fire loss

The keys to ignition resistance are the design of the structure, the materials used in its construction and the presence of defensible space Recent studies point to basic factors that affect the risk of a structure burning in a wildfire A weakness in any of these areas can lead to a similar result – a destroyed or severely damaged home or building The following information is adapted from several sources including the Insurance Institute for Building and Home Safety Additional information can be found at their website www disastersafety org/Wildfire

Flammability of the Roof

Research shows that homes with a non-combustible roof and defensible space at least 30 to 60 feet around the structure have an 85-95% change of survival in a wildfire [1] At a minimum, a home structure should have a Class A-rated, fire-resistant roof cover or assembly, and preferably one that is self-extinguishing once a falling ember burns out Self-extinguishing means that the firebrand will not burn through to the roof deck and flames will not spread to other parts of the roof Without a fire-resistant roof, other approaches toward mitigation will fall short of protecting the home

Roof shape also plays an important role If the roof has a lot of ridges and valleys or roof segments that intersect with vertical walls your house is more vulnerable to wildfire Even a Class-A roof is more vulnerable because vegetative debris and wind-blown embers readily accumulate at these intersections and can expose combustible siding, vents or windows as well as the roof to fire

Wind-blown debris and overhanging trees can lead to gutters full of leaves and needles on your roof and gutter Research has shown that a home with a gutter full of leaves has enough fuel to ignite a roof, especially if there is a path for the fire to reach any exposed flammable surfaces such as the edges of roof structure or through vents Keeping gutters clean of debris is especially important if you have a multi-story building or dormer windows where exterior siding would be exposed to flames from debris in gutters

[1] Foote Ethan Wildland Urban Interface Ignition Resistant Building Construction Recommendations Community Wildfire Protection Plan Workshops California Fire Alliance and California Fire Safe Council August 2004

Structure Openings – Vents, Doors and Windows

Many post-fire surveys of damaged buildings have shown that the attic/roof and foundation vents are key entry points for embers and flames Areas where there are direct pathways to the attic, house or crawl space provide an easy entry point This can include vents, soffits or windows prone to breaking when exposed to wildfire conditions (usually unprotected, single pane windows) Window fans, pet doors, and fireplaces chimneys can allow firebrands to enter if left open or unscreened

Recent fires have shown that screened vents alone may fail to keep embers out of attics or other spaces Pre-cut fire resistive covers are one solution New technology combines several features that increase the effectiveness of preventing embers from entering these flammable spaces, however, maintenance issues need to be evaluated when these products are considered

Testing has shown that single pane windows are highly vulnerable to breaking when exposed to wildfire conditions Larger windows are more vulnerable to breaking than smaller windows Some glass will break after only 1 to 3 minutes exposure to intense heat allowing flames and embers to get inside and further ignite furnishings Double pane windows with tempered glass for the outside pane can effectively increase the ability to survive a wildfire as well as a long-term solution for energy conservation within the home

Siding

Siding can be vulnerable for several reasons If ignited, combustible siding can provide a path for flames to reach other vulnerable components such as windows or eaves Second, a horizontal or vertical joint in the siding (or at the top or bottom of the material) can provide access for embers or flames into the house Some materials such as vinyl siding will deform and fall off the wall at relative low heat or flame exposure If this happens protection of the structure will depend on the underlying sheathing in the wall assembly

Walls need to resist heat and flames as well, as embers Non-combustible materials like three-coat stucco, fiber cement, brick and tile resist flames, but don't always resist heat and embers Therefore, incorporating sheet-rock or other non-combustible sheathing material into the wall assembly underneath the exterior material will improve performance Regardless of wall material choice, all gaps at the top or bottom edges, or at lap joints must be sealed or caulked to reduce the potential for ember intrusion Embers can also accumulate at the foundation if the lower edges of the siding material is left unsealed The more complicated the lap joint, such as tongue-and-groove or shiplap, the better the resistance from flame or embers Attention to construction detail, such as use of metal flashing where fences or decks attache to walls can prevent accumulation of debris and slow ignition

Overhanging Structures

Eaves, alcoves, entry ways, patio covers, decks, porches, and exterior stairways all have the potential to "trap" heat under them or create areas where burning embers can accumulate Openings or gaps in blocking also result in areas where wind-blown embers can become lodged and ignite debris or wood in these areas

Decking

Decks, patios and porches can become a pathway for fire into a home Most are attached to a home and adjacent to doors, windows, sliding glass doors or other openings and combustible siding Materials used to build the deck, the furniture or other items on top of the deck as well as the items stored beneath them Decks and porches can be particularly

vulnerable when the home is sited on a slope or when surrounded by vegetation where flame lengths can reach more than 30 feet exposing even elevated decks

The combustibility of wood deck boards is common knowledge, however, the performance of plastic composite decking products are less well known Some manufacturers are incorporating fire retardant chemicals into these products Information can be found at the California State Fire Marshal WUI Products website www osfm fire ca gov/strucfireengineer/pdf/bml/wuiproducts pdf In general large structural members will resist ignition better than small wood boards

Fuel Hazards

Any fuel source that will bring flames close the structure can be a hazard Examples of fuel hazards include

- flammable plants close to a wall,
- dead foliage that builds up underneath succulents or other normally fire-resistant plants,
- certain types of mulch or
- a combustible fence located close enough to allow flames to contact the overhanging roof above

Fuel sources within the "defensible space" area that support a high intensity spot fire are especially problematic These include any trees that can quickly become a fire torch such as an untrimmed palm tree, a wooden trellis made of small lumber sizes, playground equipment made with wood pieces or a pile of firewood on the ground or in a wheelbarrow

Access to the property

If firefighters and their equipment cannot gain access to the property and a water source, there is little chance they can protect the home Access also affects the ability of the homeowner to evacuate the site should the need arise In many areas of Alameda County the road patterns were established when there were fewer homes in the hills and fewer cars per residence Today these narrow roads can become constricted with on-street parking, temporary lane closures, encroachment into the road right of way by construction or by overgrown roadside vegetation

Surrounding topography and location of structures

Adjacent steep slopes and topographic features, such as natural chimneys or chutes, can intensify fire behavior Structures located mid-slope or at the top of a steep slope are more likely to be damaged A steeper slope will result in a faster moving fire, with longer flame lengths A home with little setback from the slope will need to be more aggressive with vegetation treatment and maintenance

Weather and "Red Flag" Conditions

Strong winds blowing a fire toward your house will have the same effect as being located on a slope The fire will move faster and burn more intensely with taller flame lengths, blowing embers in front of the fire during periods of high winds In Alameda County these high winds are often accompanied with a increase in temperature and decrease in relative humidity creating "Red Flag" conditions that further dry vegetation and wood building materials

5 2 Improving the Survivability of Structures within the WUI

Protecting structure exposed to wildfires is not a simple matter Structures can ignite due to direct exposure to flames, from radiated heat or from embers All three sources must be addressed in order to improve the survivability of structures within the WUI It is recommended that the following measures be taken

1 Reduce the amount of heat the structure will be exposed to through managing vegetation, creating defensible space and construction design

2 Limit the time the structure is exposed to heat through vegetation management Establishing a low fuel "home ignition zone" immediately adjacent to structures and creating "defensible space" in the first 30 - 100 feet from the house is critical

3 Use fire resistant building materials and construction methods

4 Remove combustible materials stored near structures

Creating an effective defensible space around the structure and maintaining a fire safe landscape are critical to minimizing the threat of ignition Most homes in Alameda County are subject to their local fire jurisdiction's safety regulations that require compliance with defensible space and weed abatement standards

The selection of a building's site and materials has direct relationship to its survivability New structures need to be located to reduce their exposure to the most intense part of a wildfire that might sweep across the site There also are many noncombustible and fire resistive materials and treatments available to better protect structures and inhibit fire spread

Adoption and enforcement of fire and building codes is an essential part of managing the risk in the WUI The California State Fire Marshal's Office developed state of the art building standards known as "Chapter 7A" effective January 1, 2008 for use on new building construction within Very High Hazard Severity Zones More detail about this code can be found at www fire ca gov/fire_prevention/fire_prevention_wildland php Many local cities have also adopted the code for use within their jurisdictions, or have adopted codes that exceed these minimum State standards It is also important to incorporate fire safety in the general plan safety elements in each city and for the county The State Fire Marshal's Office also maintains a list of WUI products that are reviewed for compliance with the 2007 California building code The 2011 updated of this list can be found at www osfm fire ca gov/strucfireengineer/pdf/bml/wuiproducts pdf Some of these products may be applicable to retrofit of existing structures

No fire department can be expected to prevent all home losses in a WUI setting The potential for a wildfire to outpace suppression efforts means that all homeowners in WUI areas must accept a high degree of risk, as well as responsibility

5 3 Retrofitting an Existing Structure for Survivability

Many of Alameda County's communities-at-risk from wildfire are largely built out In these communities new construction will occur as infill between existing homes, so the new building codes offer few opportunities to increase structure survivability In these communities identifying opportunities to retrofit existing homes and businesses is key to reducing losses due to wildfire Funding for retrofit of existing structures has been non-existent in the past In 2011,FEMA has provided two grants to assist with wood shake roof replacement (Lake Tahoe Basin FEMA shake roof program and San Bernardino Mountains FEMA wood shake roof replacement assistance)

Priority Action: Education and Training on Structure Retrofit

Recommendation: Education and training related to retrofit of existing homes and structures to improve their survivability. Identify what can be done without major remodel. Evaluate new technologies, materials and products that are available for retrofit and the pros and cons.

Implementation Actions:

- Find funding for education and training program.
- Educational booklet of simple things homeowners can do.

Lead and Partners: No lead identified. Institute for Building and Home Safety has information and research. State Fire Marshal's Office has materials and product information related to Code 7A.

Time frame: On going.

Estimated Funding Need: $$ for training and materials.

Priority Action: Access and Egress Improvements by Reducing Road Restrictions

Recommendation: Address road restrictions that could restrict emergency access and public egress during evacuation from wildfire.

Implementation Actions:

- Identify types of road restrictions such as on street parking, temporary closures, construction, roadside vegetation.
- Explore potential concepts that could address the issue. These could include property inspections, pubic education, homeowner association education, roadside vegetation management, restriction of parking, construction permits or right-of-way encroachment on high fire days.
- Several jurisdictions have attempted to restrict parking with significant negative reaction.
- Successful posting of no parking during high fire days has occurred on Grizzly Peak Blvd near the UC Berkeley Campus due to a joint effort by UC Berkeley and City of Oakland.

Lead and Partners: No lead identified.

Time frame: On going.

Estimated Funding Need: $ for public information and materials.

The Insurance Institute for Building and Home Safety (IBHS) continues to sponsor building safety research that leads to real-world solutions They have identified key areas at risk and offer retrofit ideas The following table has been adapted from IBHS, see www disastersafety org/Wildfire for additional detailed information

Retrofitting Existing Structures to Increase Wildfire Survivability

Survivability Threat	*Retrofit*	*Relative Cost/ Ease*
Roof – the most vulnerable part of your home		
Combustible roof	Professional roof inspection to determine if covering and assembly are not "Class A Need to remove old roofs	$$$$ Contractor
Gaps at edges or ridges or other openings in tile (clay) or metal roof	Install bird stops in gaps at edges or ridges Plug any roof openings that are not functioning as vents	$ $$ Contractor or Experienced DIY
Combustible siding where lower level roof (first floor) meets upper wall or upper level roof (second floor)	Replace siding with more fire resistant material and underlayment	$$ $$$$ Contractor or Experienced DIY
Vegetative debris accumulated on roof	Routinely remove from roof For complex steep roofs may consider hiring professional	Free $ Agile homeowner
Vents – vulnerable to wind-blown embers and flames		
Unscreened or unprotected vents	Attach screens or prepare solid covers to install when a wildfire is approaching Use caution when installing or removing covers on upper story vents	$ Agile homeowner
Planning to replace vents	Several types of new vent covers on market designed to reduce risk of wind blown embers See osfm.fire.ca.gov/	$$ Experienced DIY
Gutters – fuel for falling embers could lead to fire in attic		
Vegetative debris accumulated in gutters	Clean gutters on regular gutters For complex steep roofs may consider hiring professional	Free $ Agile homeowner
Tired of cleaning gutters	Gutter covers help manage debris build up Can result in accumulation of debris on roof behind gutter – so some maintenance may still be required	$$
Open Eaves or Projections – vulnerable to flame or embers could lead to fire in attic		
Open eave construction or visible gaps between blocking and rafter tails	Plug openings with durable caulk or install non combustible covering over blocking to eliminate openings Alternatively box in eaves This method may require vents to remove excess moisture	$ $$$ Contractor or Experienced DIY
Combustible soffit material or materials used to box in eaves (such as wood boards untreated plywood)	Replace with non combustible material such as fiber cement product or exterior fire retardant treated plywood Vinyl soffit material not recommended as it will deform and sag causing gaps	$$ $$$ Contractor or Experienced DIY

Retrofitting Existing Structures to Increase Wildfire Survivability

Survivability Threat	*Retrofit*	*Relative Cost/ Ease*
Windows – open windows are most vulnerable The vulnerable part of a closed window is the glass		
Single pane windows	Install dual pane windows Preferred are dual pane insulated glass with added benefit of greater energy conservation Tempered glass is 4 times more resistant to breaking in wildfire Consider dual pane tempered glass Cost increases are relative to the opening size	$$$ $$$$ Contractor
No window coverings to protect from glass breakage	Shutters or pre made covers will protect window from embers debris and radiant heat exposure These would be installed prior to evacuation Least expensive alternative is ½ plywood but need to clear area of combustible material that could ignite plywood	$ $$ Contractor or Experienced DIY
Siding – fire from ignited siding can spread into stud cavity and up wall into eave, soffit or attic as well as expose window to flames		
Combustible siding	Residing is expensive but can be worthwhile if building is 15 feet or closer to adjacent properties or if inadequate defensible space Replace with non combustible siding so vertical flame spread will not be a problem unless you have other combustible materials of highly flammable plants adjacent to wall Siding products and assembles that are better able to resist penetration of flames into stub cavity can be found at osfm.fire.ca.gov/	$$$$ Contractor
Gaps in joints of siding panels or simple laps joint or plain bevel joint	Panel products have fewer lap joints and can be considered less vulnerable Wood siding shingles and plain bevel lap joints are most vulnerable	$$$$ Contractor
Decks – decks can lead a wildfire directly into you home		
Deck boards of combustible material	Replace deck boards with fire or ignition resistant material Learn more about choosing wildfire resistant decking at osfm fire.ca gov/	$$$ $$$$ Contractor or Experienced DIY
Combustible materials stored under or on top of deck	Move material to an enclosed area away from structure If you choose to enclose underside of deck be sure to address moisture management issues through drainage and ventilation	Free $$ Experienced DIY
Enclose area below deck to reduce accumulation of wind blown debris or embers	Use solid non flammable material (fiber cement product or exterior fire retardant treated plywood not lattice to enclose area below decks Be sure to address moisture management issues through drainage and ventilation	$ $$ Experienced DIY

Sustaining the Plan

6 1 Updates of Action Plan

To ensure long-term success the CWPP needs to include a method for changing, updating and revising the plan As partners learn from success and challenges they may identify new actions or propose a shift in how decisions are made or actions accomplished

It is important to recognize that many communities may lack resources to engage in a complex planning, monitoring and adaptive management process The collaborative planning effort for the development of this Alameda County Community Wildfire Protection Plan was funded through a generous grant, however, similar funding is unlikely to be available for update efforts Regardless, streamlined communications can leverage the initial planning effort to maintain a functioning collaboration and provide updates

Project partners have agreed to the following roles in sustaining the Plan

- Diablo Fire Safe Council Communicate electronically with stakeholders and other partner agencies collecting information for an annual status of the plan Annual information will include at a minimum an update of the status of geographically based fuel reduction projects and prevention strategies listed in Section 4 Prioritizing Fuel Reduction Treatments and of the priority action projects identified in Sections 3, 4 and 5 Updated information will be posted on the DFSC website and sent electronically to CWPP planning participants and other interested stakeholders
- Hills Emergency Forum Provide updated information on projects and activities through their Annual Report prepared each October to coincide with the anniversary of the 1991 Tunnel Fire
- Alameda County Association of Fire Chiefs The Alameda County Association of Fire Chiefs provides a forum for interagency information sharing across the many fire jurisdictions They are in the unique position to continue to foster inter-jurisdictional cooperation on WUI issues and emergency response
- East Bay Regional Park District At a public meeting each Spring, review the next year's proposed program of work for fuels management on park district lands As part of the annual budget development process, during a Spring meeting of the EBRPD Board of Director's Executive Committee, report the prior year's fuels management accomplishments and present the proposed program of work for the next year Work with cooperators to plan and conduct work in a way that improves fire protection and program efficiencies for both EBRPD and the cooperator
- Oakland Wildfire Prevention Assessment District (WPAD) The Oakland WPAD Citizen Advisory Committee meets monthly and works with home and property owners to reduce the risk of urban wildfires in the Oakland hills They will continue to offer leadership in identifying Oakland projects, leveraging local funding with outside funds such as grants, and serving as a liaison to Oakland residents and other partners in Alameda County
- CAL FIRE The Santa Clara Unit Strategic Plan updates provide opportunity to view wildfire protection for Alameda County in context with neighboring Contra

Costa, Santa Clara and San Joaquin Counties Alameda County is Battalion 4 of seven geographically based battalions in CAL FIREs Santa Clara Unit The most recent plan was completed in June 2011 The Santa Clara Unit collects information from the various stakeholders to develop their unit plan each June The final unit plan will be shared with DFSC, who will incorporate the information into the CWPP annual updates

- Association of Bay Area Governments (ABAG) ABAG has provided leadership in the development and updates of FEMA Multi-Jurisdictional Hazard Mitigation Plan, completed once every 5 years The next update is scheduled for 2015 ABAG welcomes any jurisdiction or special district in Alameda County to participate in this process and will incorporate information from CWPP updates into the plan
- North Hills Community Association Fire Prevention Committee The North Hills Community Association (NHCA) is a non-profit group in the Berkeley-Oakland Hills whose purpose is to develop and sustain an environmentally healthy community that is safe, secure, beautiful and a welcoming place in which to live Cognizant of the dangers of fire they have committed to providing information both to and from residents in their group They are especially interested in developing simple education materials targeted to homeowners that provide information relevant to the conditions in their neighborhoods Hiller Highlands Phase V has over 15 years of steadily improving vegetation management on 14 acres of steep hillsides
- Other Partners **Note This section to be further developed as the plan is implemented**

6 2 Monitoring, Evaluating and Adapting Strategies

The following framework offers strategies to monitor, evaluate and adapt the elements of the CWPP[1] Strategies might include

- Only monitor what matters Partners should identify key goals and objectives and make decisions to monitor what is most important to the long-term sustainability of their CWPP
- Tracking accomplishments and identifying the extent to which CWPP goals have been met This might include development of "success stories " (Examples can be found at www diablofiresafe org/current html and at Hiller Highlands Phase V where the 14 acres have been under management for the past 15 years)
- Examining collaborative relationships and their contributions to CWPP implementation, including existing participants and potential new partners
- Identifying actions and priority fuels reduction projects that have not been implemented and determining why
- Setting a course for future actions and updating the plan

[1] Evaluation framework adapted from Community Wildfire Protection Plan Evaluation Guide Prepared by Resource Innovations, Institute for a Sustainable Environment August 2008 University of Oregon csfs colostate edu/pdfs/eval 9-8 08 web pdf Accessed 3/5/2012

- Evaluating the resources necessary for successful CWPP implementation Identifying needed community and homeowner outreach and education programs

In conducting an evaluation it is important to think critically about the kind of information that is accessible, what is most important to evaluate and how it might influence future priority activities For example, the number of homes in a community with an evacuation plan provides insight into the level of preparedness among the general public, but may be difficult to obtain Each community within Alameda County should adapt the evaluation process, how information and results are documented with an eye toward refinements of the CWPP to meet their own needs The following ideas for monitoring and evaluation are provided as suggestions

6 2 1 Evaluating Information, Education and Collaborative Planning

Understanding the extent to which information, education and collaborative planning have been maintained, grown or diminished through implementation of the CWPP will help identify strategies to strengthen future efforts Monitoring and evaluation might address

Programs What kind of information, education and public involvement has the CWPP or its implementation fostered? Public meetings, trainings, field trips, demonstration projects, household visits, youth engagement, community events, clean up days

Public Awareness What kind of change in public awareness about wildfire has resulted from the plan or implementation actions? Knowledge of fire policies and regulations change in number and type of human caused wildfires, awareness of local efforts to increase emergency preparedness, outreach efforts or techniques

Activities What kinds of activities have citizens taken to reduce wildfire risks as a result of the plan? Defensible space, fuel reduction, household emergency plans, woody debris disposal

New information Are there new or updated data sources that might change the risk assessment and influence priorities? Changes to process used to identify fuels treatments priorities? New wildfire related policies or ordinances? Index to access specific information?

Involvement Who has been involved with CWPP development and implementation? How have relationships changed or grown? What expertise or resources did partners bring? Numbers and types of partners (local, state, federal)? Accomplishments or challenges?

Implementation Capacity How has the collaborative process assisted in implementing the CWPP and building capacity for the community to reduce wildfire risk? More partnerships, increased financial resources, increases in programs or activities

Engagement Have the partners involved in the planning process remained engaged in the implementation? Have new partners become involved?

6 2 2 Evaluating Suppression Capability and Emergency Preparedness

Comprehensive emergency management plays a key role in reducing a community's risk from wildfire and other hazards Integrating federal requirements for multi-hazard mitigation within the CWPP efforts can help access federal funds through FEMA and Department of Homeland Security

Alignment Is the CWPP aligned with emergency operations plans and other hazard mitigation plans? Addressing National Incident Management System (NIMS), State Emergency Management Plan (SEMS) and Incident Command Training (ICS)

Evacuation Planning Does the CWPP include an evacuation plan? Has the plan been tested? Are there local neighborhood evacuation plans animal and livestock preparedness, communication systems, resources list?

6 2 3 Evaluating Fuel Reduction

Monitoring hazardous fuels reduction projects on private and public lands will assist stakeholders in understanding the extent to which risk reduction goals and native habitat preservation goals are being accomplished Monitoring these projects allows stakeholders to better understand the extent of resources need to accomplish and maintain goals, as well as to help in identifying future priorities

Fuel Reduction on Public Lands How many acres have been treated on public land that had been identified as high priority projects? Total number of acres treated, number and percentage in WUI, number and percentage within CWPP priority area, treatment types

Fuel Reduction on Private Lands How many acres have been treated on private land that had been identified as high priority projects? Total number of acres treated, treatment types number of homes with defensible space, number and percentage treated in low income communities/ vulnerable populations

Compliance How many homes are in compliance with local fuel reduction around homes requirements Weed abatement requirements Defensible space inspections

Joint Projects How many projects have spanned ownership boundaries including public and private lands?

Jobs Economic development and local jobs resulting from fuels reduction or restoration activities Number of green tons/ volume of woody fuel utilized Number of part-time/ full time jobs Percentage of local labor

Environmental Protection Ecological monitoring to assess environmental outcomes and maintenance requirements Community surveys using photo points Vegetation/ invasive weed surveys

6 2 4 Evaluating Reducing Structure Ignitability

Monitoring structure survivability of existing structures and new developments span a wide range of actions including retrofit, codes, public knowledge and emergency response capability

Fire Statistics Wildfire loss in year reporting on Number of fire starts within high hazard areas Number of human caused fires Number of homes damaged/ lost to wildfire

Codes and Regulations Current codes and regulations for wildfire hazards Building codes (Chapter 7A or better) How is new development increasing in high hazard areas Requirements for new developments Mechanism for long term open space fuel management Infill requirements Infrastructure design requirements (roads, sprinklers, utilities = NFPA standards)

Public Education Public knowledge and understanding about structure ignitability Homeowner education on how to reduce ignitability How many homes have been retrofitted Number and percentage of homes in high hazard area included in fire district

Response Capabilities Changes of local fire agency response capability Increase in certified fire fighters/ wildfire training Upgraded or new fire suppression equipment Changes in response time, infrastructure access routes

Signature Page

Alameda County Community Wildfire Protection Plan Mutual Agreement

This Community Wildfire Protection Plan developed for Alameda County

- Was collaboratively developed Interested parties and agencies managing land in Alameda County have been consulted
- This plan identifies and prioritizes areas for hazardous fuels reduction treatments and recommends types and methods of treatments that will protect community members and values at risk
- This plan recommends measures to reduce ignitability of structures throughout the area addressed by the plan

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

Alameda County Board of Supervisors

Signature _____

Alameda County Fire Chiefs Association

Signature _____

Alameda County Fire Department

Signature _____

Berkeley Fire Department

Signature _____

California Department of Forestry & Fire Protection, Santa Clara Unit

Signature _____

City of Oakland

Signature _____

City of Alameda Fire Department

Signature _____

Diablo Fire Safe Council

Signature _____

East Bay Municipal Utility District

Signature _____

East Bay Regional Park District, Fire Department

Signature _____

Fremont Fire Department

Signature _____

Hayward Fire Department

Signature _____

Hills Emergency Forum

Signature _____

National Park Service

Signature _____

University California, Berkeley

Signature _____

US Fish and Wildlife Service

Signature _____