WHEN IT’S HOT, LOCAL MEDIA REMINDS READERS THAT THEY LIVE IN WILDFIRE COUNTRY. IN WILDFIRE COUNTRY “IT’S NOT RETREAT—IT’S FIGHT BACK”
EVERYONE IN BERKELEY WAS SURPRISED ON SEPTEMBER 17, 1923 WHEN A FIRE APPEARED ON THE RIDGE AND RACED DOWNHILL FOR TWO HOURS THROUGH 584 HOMES

EARLY FIRE HISTORY FOR THE EAST BAY HAS NOT BEEN ARCHIVED, BUT WE KNOW ABOUT THE BIG ONES
THE BERKELEY FIRE WAS CALIFORNIA'S MOST DESTRUCTIVE WILDFIRE FOR THE NEXT 67 YEARS
1924 TO 1960

MANY FIRES WERE REPORTED IN THE NEXT 13 YEARS BY TWO NEW LOOKOUT TOWERS

- 70 FIRES <10 ACRES 45%
- 32 FIRES 11 TO 40 ACRES 21%
- 32 FIRES 41 TO 100 ACRES 21%
- 12 FIRES 101 TO 300 ACRES 8%
- 5 FIRES 301 TO 1000 ACRES 3%
- 3 FIRES ALMOST 2,000 ACRES 2%
AFTER THE BERKELEY FIRE, TWO REGIONAL AGENCIES WERE FORMED. BOTH MANAGED LAND AND PROVIDED EARLY RESPONSE FIRE FIGHTING EAST OF THE HILLS.

EBMUD IN 1923- TO FIND A RELIABLE WATER SUPPLY FOR GROWING EAST BAY CITIES, AND TO OWN 24,000 ACRES OF LOCAL WATERSHED IN 1928.

EBRPD IN 1934- TO EVENTUALLY OWN 13,000 ACRES OF PARKLAND EAST OF THE HILLS.
EVERYONE IN OAKLAND WAS SURPRISED ON SEPTEMBER 22, 1970 WHEN A FIRE DESTROYED 36 HOMES AND DAMAGED 37 HOMES IN 70 MINUTES

CALIFORNIA AFLAME 1970
FIRST CALIFORNIA SIEGE OF FIRES OVER 13 DAYS. 733 FIRES DESTROYED 722 HOMES, 580,000 ACRES BURNED, AND 16 LIVES LOST

NO MAJOR FIRES OCCURRED UNTIL THE FISH FIRE
1970 FISH FIRE

FOUR CORNERS

FISHRANCH ROAD

CLAREMONT CANYON

GARBER PARK

PARKWOODS APTS.

WIND DRIVEN,
70 MINUTE FIRE SPREAD
1970 FISH FIRE

FOUR CORNERS

FISHRANCH ROAD

PARKWOODS APTS.

CLAREMONT CANYON

GARBER PARK

WIND DRIVEN, 70 MINUTE FIRE SPREAD
1970 Fish Fire

Wind driven, 70 minute fire spread.
1970 FISH FIRE

FOUR CORNERS
FISHRANCH ROAD
PARKWOODS APTS.
CLAREMONT CANYON
GARBER PARK

WIND DRIVEN, 70 MINUTE FIRE SPREAD
A nine day November freeze killed or damaged thousands of eucalyptus trees with 800 acres cleared in 3 years by EBRPD, EBMUD, UC, and Oakland.

The first hill fuelbreak is created along the high ridge. Stump sprouts were being controlled by two EUC crews until herbicide opposition and Prop. #13 resulted in crew reassignment. Coppice suckers are now 50' trees.

The Vegetative Management Plan for the Eucalyptus Freeze Affected Areas in the Berkeley-Oakland Hills.
1972 FREEZE IMPACTS
5 homes were lost in a wind-driven fire at 2 PM on December 2, 1980 from a powerline ignition on Wildcat Canyon Road that spread under eucalyptus trees.

5 mayors demanded that a blue ribbon committee be formed to develop a new fire plan.
1. FIRES WOULD START EAST OF THE RIDGE IN PARKLAND

2. FIRES WOULD BURN FAST UPHILL

3. FUELBREAKS AND QUICK FIREFIGHTING AT THE RIDGE WOULD STOP PARK FIRES BEFORE HOMES ARE INVOLVED

4. THE "E" CITY ZONE DESIGNATION WOULD RESULT IN FIRE READY INTERFACE RESIDENTIAL AREAS

5. FORM A JOINT POWERS AGENCY TO MANAGE THE HILL FIRE HAZARD PROBLEM

A PAPER PLAN WITH LITTLE AGENCY IMPLEMENTATION
9 YEARS LATER

OAKLAND WAS SURPRISED ON OCTOBER 20, 1991 BY A RAGING FIRESTORM IN TUNNEL CANYON
SATURDAY FIRE- NO WIND. SUNDAY REKINDLE- 40MPH DIABLO WINDS.
FIRE AND EMBER SPREAD WAS UNIMAGINABLE!
MANY RESIDENTS HAD JUST MINUTES TO FLEE FOR THEIR LIVES.
AND, THEY HAD TO EVACUATE WITHOUT A WARNING OR A CLEAR PLAN!

FIRST RESPONDERS WERE TOTALLY INVOLVED IN EVACUATING RESIDENTS, AND COULD NOT FIGHT FIRE UNTIL THE WINDS CHANGE.
TRYING TO STOP THE FIRE IN THIS AREA WAS FUTILE

IT BLEW ONE MILE THROUGH 790 HOMES IN LESS THE ONE HOUR

ONE HOUSE IN EVERY 11 SECONDS

10-12 NOON

MORNING WIND

6 LANE FREEWAY
25 DIE, 3,000 HOMES LOST, 1,520 ACRES BURNED, AND 10,000 PEOPLE EVACUATED

450 ENGINES AND 1,500 FIREFIGHTERS RESPOND BY DAYS END
BEFORE

AFTER

ALL ON FIRE WITHIN 30 MINUTES
PINES ALONG OAKLAND’S OPEN SPACE HILLSIDE
TUNNEL CANYON HOMES WITH TALL EUCALYPTUS AND PINE TREES
TUNNEL CANYON EUCALYPTUS, PINE, FLAMMABLE HOMES, AND DIABLO WINDS
PINES AND EUCALYPTUS NEAR TUNNEL HOMES AND PARKWOODS APARTMENTS
EUCALYPTUS ABOVE HWY #24, AND PINE HILLSIDE NEAR HILLER HIGHLANDS
HOW COULD THIS HAPPEN?

NO ONE TOLD US!

WHO'S AT FAULT?

NEVER AGAIN!
AFTER THREE YEARS OF WORK, THE 1995 HILLS EMERGENCY FORUM FIRE HAZARD MITIGATION PROGRAM & PLAN WAS ACCEPTED BY ALL AGENCIES.....NO EIR!
The 1995 plan identified where the fire hazards are.

Agency fuel management.
WE NOW KNOW THERE IS A HISTORY OF LARGE WIND DRIVEN FIRES IN THE HILLS
WE NOW KNOW HOW INCREASINGLY DANGEROUS FIRES HAVE BEHAVED
There was a strategy in the 1995 HEF plan:

- Diablo wind fires will occur here that fire departments may not be able to stop.

An 8' maximum flame buffer (500') installed here between wildland vegetation and residential areas.

Eucalyptus and pine are managed or removed to reduce embers blowing over the buffer into homes.

Firefighters would work to save ember resistant homes with defensible space in residential areas.
OAKLAND AND BERKELEY APPROVE PARCEL TAX FUNDING FOR THEIR CITY FIRE MITIGATION PROGRAMS. CITIES DEVELOP AND RUN THEIR OWN LOCAL CITY PROGRAMS FOR DEFENSIBLE SPACE, EMERGENCY EVACUATION, AND FOR UPDATED FIRE SUPPRESSION CAPABILITY.

1995 - FOUR YEARS OF SERIOUS DEBATE RAGE ON ABOUT THE HEF PLAN FOCUSING ON ENVIRONMENTAL DETAILS, EUCALYPTUS TREES, THE 500' BUFFER ZONE, LANDSLIDES, SPECIAL RESOURCE PROTECTION, PROJECT COSTS, AND THE LACK OF AN EIR.

2000 - A TEMESCAL 40 MEMBER WORKING GROUP IS FORMED BY STATE ASSEMBLYMAN TOM BATES, FEMA URBAN WILDFIRE SPECIALIST LEO LEVENSON, AND EBRPD AGM JERRY KENT. THEY ARE ABLE TO REACHED AGREEMENT ON AN UPDATED JOINT AGENCY FIRE PLAN OUTLINE AND OUTLINE FOR A PROJECT EIR. THE PARK BOARD AGREED TO SUPPORT THE PLAN OUTLINE AND TO SEEK FUNDING FOR REQUIRED CONSULTS.

2004 - EBRPD MEASURE CC PASSES WITH $1 MILLION FOR AN UPDATED JOINT AGENCY PLAN/EIR AND PROGRAMMATIC EIR WITH $9 MILLION FOR PARK DISTRICT FIRE MITIGATION PROJECTS.

2005 - HEF AGENCIES DECIDE NOT TO DO A JOINT PROGRAMMATIC EIR AND TO GO IT ALONE WITH INDIVIDUAL VEGETATION MANAGEMENT PLANS AND EIRS.

CITIES HAVE ALWAYS DONE THEIR OWN INDIVIDUAL PLANS FOR DEFENSIBLE SPACE, EMERGENCY EVACUATION, AND FOR UPDATED FIRE SUPPRESSION CAPABILITY.

THE EAST BAY HILLS EMERGENCY FORUM HAS CONTINUED TO PROVIDE ACTIVE LEADERSHIP FOR MEMBER AGENCIES FOR THE PAST 27 YEARS.
THE BERKELEY LAB ADOPTED ITS OWN WILDLAND FIRE REDUCTION PROGRAM IN 2000

Six years into this complex effort, the Lab has expended a very modest $1.1 million with $600,000 of remaining corrective vegetative work to be done over the next two years. This represents about three-tenths of one percent of the value of just the Lab's buildings (not counting that which is inside). After this initial work is completed, the annual vegetation management bill to insure the future existence of the Lab will be approximately $100,000.
2005- Using Measure CC funding, the Park District began work on its Wildfire Hazard Reduction, Resource Management Plan, and EIR for Hill Regional Parks.

After 5 years and $1 million, the plan is completed in 2010.
ALAMEDA AND CONTRA COSTA COUNTIES BOTH PRODUCED CWPP’S

MAJOR PROJECTS REQUIRE CEQA COMPLIANCE, AND CWPP’S ARE NOT READY FOR LARGE GRANTS

As Fire Chief for the East Bay Regional Park District I am pleased to support the Alameda County Community Wildfire Protection Plan to fulfill the standards established by the Federal Healthy Forest Restoration Act (HIFRA). The plan will act as a multi-year guiding document that will facilitate implementation of present and future fire hazard mitigation measures.
IN 2006, OAKLAND, UC, AND EBRPD WERE AWARDED GRANTS TOTALING $5.6 MILLION. FEMA THEN LAUNCHED A 9 YEAR EIS PROCESS COVERING 2,059 PROPOSED ACTION AND CONNECTED ACRES. A USFWS BIOLOGICAL OPINION COVERED 3,152 ACTION AND CONNECTED ACRES.

COSTS ARE UNKNOWN, BUT GUESSES ARE ABOVE $10 MILLION
OAKLAND AND BERKELEY AND OTHER AGENCIES PREPARED LOCAL HAZARD MITIGATION PLANS

City of Oakland
2016-2021 Local Hazard Mitigation Plan
Adopted June 7, 2016

“THE CITY WILL PUT THE WPAD ON THE BALLOT AGAIN”

City of Berkeley
2014 Local Hazard Mitigation Plan
June 1, 2014

“Berkeley is most vulnerable to a wind-driven fire from land owned by UC Berkeley, the East Bay, Regional Park District, and the City of Oakland”
OAKLAND’S $650,000 DRAFT PLAN FOR 1,900 ACRES OF CITY PARKLAND IS CURRENTLY BEING REVIEWED AND REVISED. NEXT DRAFT DUE IN MARCH OF 2019

DRAFT
City of Oakland, California
Vegetation Management Plan

Prepared for:
City of Oakland
Oakland Fire Department
700 Frank H. Ogawa Pl. Suite 31
Oakland, California 94611
Contact: Angela Robinson Ahman

Prepared by:
DUDEK
653 Lincoln Way, Suite 209
Auburn, California 95603
Contact: Scott Edwards, PE

MAY 2018

600 PAGES
100 YEARS OF FIRE EXCLUSION WAS WRONG

THINNING AND PRESCRIBED FIRE IS RIGHT

AS WE STRUGGLED IN THE EAST BAY, THE SCIENCE OF FOREST MANAGEMENT CHANGED, WITH IMPACTS FOR THE MANAGEMENT OF CALIFORNIA'S FORESTS NEAR OR IN HIGH RISK WUI's.

WE ARE NOW TOLD THAT 100 YEARS OF FOREST MANAGEMENT WAS WRONG AND THAT HOUSES CAN BEST BE PROTECTED IF HOMES ARE EMBER RESISTANT AND VEGETATION IS MANAGED IN HOME IGNITION ZONES (HIZ)

THIS MAY ALSO BE TRUE TODAY FOR DENSLEY DEVELOPED WUI AREAS
Early science for protecting homes (after 1990 paint fire)

Percent of homes destroyed by wildfire

- 15% Wood roofs
- 15% Wood roofs
- 28% Wood roofs
- 60% Wood roofs
- 5% Fire resistant roofs
- 2% Fire resistant roofs
- .7% Fire resistant roofs
- 24% Removal of flammable vegetation
- 30-80 removal of flammable vegetation
- 80-100 removal of flammable vegetation
- 100 or more removal of flammable vegetation

GRAPHIC FOR PROTECTING EMBER PROOF HOME WITH 100’ OF DEFENSIBLE SPACE ON FLAT LOTS

NOT VERY USEFUL FOR THE EAST BAY HILLS
AND, WE KNOW THAT AN UNPREPARED HOME CAN REPRESENT 90% OF THE FUEL ON A LOT

<table>
<thead>
<tr>
<th>Standard Fuel Models</th>
<th>1/4 acre of vegetation fuel expressed as Btu's</th>
<th>Fuel in a typical house expressed as Btu's</th>
<th>Vegetation fuel by %</th>
<th>House fuel by %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Short grass</td>
<td>3 million Btu</td>
<td>151 million Btu</td>
<td>2%</td>
<td>98%</td>
</tr>
<tr>
<td>2 Timber (grass understory)</td>
<td>8 million Btu</td>
<td>151 million Btu</td>
<td>5%</td>
<td>95%</td>
</tr>
<tr>
<td>3 Tall grass</td>
<td>11 million Btu</td>
<td>151 million Btu</td>
<td>7%</td>
<td>93%</td>
</tr>
<tr>
<td>4 Chaparral</td>
<td>19 million Btu</td>
<td>151 million Btu</td>
<td>11%</td>
<td>89%</td>
</tr>
<tr>
<td>5 Brush</td>
<td>4 million Btu</td>
<td>151 million Btu</td>
<td>3%</td>
<td>97%</td>
</tr>
<tr>
<td>6 Dormant: brush/ slash</td>
<td>9 million Btu</td>
<td>151 million Btu</td>
<td>6%</td>
<td>94%</td>
</tr>
<tr>
<td>7 Southern rough</td>
<td>8 million Btu</td>
<td>151 million Btu</td>
<td>5%</td>
<td>95%</td>
</tr>
<tr>
<td>8 Closed timber litter</td>
<td>10 million Btu</td>
<td>151 million Btu</td>
<td>6%</td>
<td>94%</td>
</tr>
<tr>
<td>9 Hardwood litter</td>
<td>12 million Btu</td>
<td>151 million Btu</td>
<td>7%</td>
<td>93%</td>
</tr>
<tr>
<td>10 Timber (litter understory)</td>
<td>20 million Btu</td>
<td>151 million Btu</td>
<td>12%</td>
<td>88%</td>
</tr>
</tbody>
</table>

BURNING EMBERS WILL QUICKLY SPREAD FIRE INTO DEVELOPED AREAS
WHERE HOME HARDENING WILL HELP RESIST THE INITIAL IGNITION AND REDUCE HOME TO HOME IGNITATIONS

Proceedings of the California’s 2001 Wildfire Conference: 10 Years After the 1991 East Bay Hills Fire
Home Survival in Wildfire-Prone Areas: Building Materials and Design Considerations

STEPHEN L. QUARLES, UCCE Natural Resources Advisor, Contra Costa County; YANA VALACHOVIC, UCCE Forest Advisor, Humboldt County; GARY M. NAKAMURA, UCCE Area Forestry Specialist, Shasta County; GLENN A. NADEL, UCCE Natural Resources Advisor, Sutter-Yuba Counties; and MICHAEL J. DE LASAUX, Natural Resources Advisor, Plumas-Sierra County

Introduction

Wildfires are the most important cause of home ignitions. Recent research indicates that two out of every three homes destroyed during the 2003 Witch Creek Fire in San Diego County were ignited either directly or indirectly by wind-dispersed, wildfire-generated, burning or glowing embers (Marrangoni and Moll 2009) and not from the actual flames of the fire. Those embers are capable of igniting and burning your home in several ways. In order to have a wildfire-safe home, two equally important factors must be implemented: 1) the wise selection of building materials and design that will help the home resist the wildfire and 2) the home must have adequate defensive space based on the wise selection, placement, and maintenance of near-home vegetation.

There is a direct link between home survival and vegetation management required to develop adequate defensible space around the home and the building materials and design used to construct the home. The area where your vegetation should be managed (i.e. your defensible space) will depend on the particular topography and setting of the home on the property. Information included in this publication is focused on the home and is intended to provide information to help you make “fire-wise” decisions regarding material choices and design decisions, whether you are building a new home or retrofitting your existing home. A considerable amount of information has been published in recent years on defensible space and vegetation management. Check with your local cooperative extension office or fire department for information appropriate to your area.

Ignition of Homes in Wildfire-Prone Areas

Wildfire spread by a combination of a moving fire front and airborne burning and glowing embers. Building loss during wildfires occurs as a result of some part of the building igniting from one or more of the three basic wildfire exposures, which include: 1) embers (also called firebrands), 2) radiant heat, and 3) direct flame contact. Embers are light enough to be blown through the air, and can result in the rapid spread of wildfire by leaping (in which embers are blown ahead of the main fire, starting other fires), should those embers land on or near your house, they could just as
SOME GROUPS ARE LOBBYING FOR HOME HARDENING AND DEFENSIBLE SPACE ONLY!
NO FUELBREAKS, NO FOREST THINNING, AND NO OPEN SPACE VEGETATION MANAGEMENT

"START FROM AN EMBER PROOF HOME AND WORK OUT 5/30/100 FEET"
THEY AND MANY FIRE BEHAVIOR SCIENTISTS NOW SAY THAT MANAGING THE HIZ WITH AN EMBER PROOF HOUSE AND THINNED TREES IS THE BEST METHOD FOR SAVING HOMES.

START FROM THE HOME AND WORK OUT

100’ TO 200’ OF DEFENSIBLE SPACE, AND EMBER RESISTANT HOME ON YOUR LAND

NO FIRE TRUCK NEEDED
IF THEY ARE RIGHT- SHOULD THINNING AND REMOVING TREES IN HOME IGNITION ZONES BE REQUIRED WITH LITTLE MANAGEMENT IN OPEN SPACE AREAS?

MANAGING HOME IGNITION ZONES IN THE HILLS SOUNDS ATTRACTIVE.

TREES ON ROUNDTOP ABOVE THORNHILL AND SHEPHARD CANYON'S WOULD NOT NEED TO BE MANAGED.
TREES AND SHRUBS ABOVE OAKLAND’S CALDECOTT PARK MIGHT NOT NEED TO BE MANAGED
EAST SIDE OF CALDECOTT TUNNEL CANYON

OAKLANDS DENSE SUCKER BASHED EUCALYPTUS MIGHT NOT NEED TO BE MANAGED

EUCALYPTUS SUCKERS AND SEEDLINGS COULD BE LEFT TO BURN AGAIN IN THE NEXT FIRE

COPPICE EUCALYPTUS ABOVE THE OAKLAND SPORTS COMPLEX
BUT, THOSE THOUGHTS ALONE ARE UNREALISTIC. WE WILL NEED TO MANAGE VEGETATION AND APPLY THE NEW FOREST SCIENCE IN THE WUI. BUT, WILL IT WORK WITH EAST BAY EUCALYPTUS, PINE, AND NATIVE TREES?

Basic Principles of Forest Fuel Reduction Treatments


Wildfire severity and size are of increasing concern in the western United States, where fire exclusion and subsequent fuel accumulations have resulted in uncharacteristically large, severe wildfires. This pattern of increased fire risk is well-recognized on both management and policy levels, yet the fire community still lacks clear, broadly applicable solutions to the wildfire problem. A number of treatment options are available at the local level, and land managers employ these options in various combinations and at different time intervals and spatial scales. These options are the focus of a large body of literature, wherein their efficacy, cost, and social acceptability have been examined in detail. However, it can be difficult to navigate this information, and there is a need for a clear, concise analysis of the relative merits of different treatments.

In this paper, Agnew and Skinner reviewed related literature, simulated fire behavior in different treatment types, and considered real-world examples of fuels treatments and wildfires. Using these methods, they distilled a set of basic principles underlying effective treatments that reduce fuels and limit wildfire severity and extent.

Firewise principles

The authors identify four “Firewise principles” that are essential to successful fuel reduction treatments. Based on their analyses, effective fuel treatments should do the following:

1. Reduce surface fuels.
2. Increase height to the base of live crowns.
3. Decrease canopy density.
4. Keep large trees of fire-resistant species.

These four principles address the drivers of intense surface fires and crown fires, which include surface fuels, ladder fuels, and dense canopies.

Management Implications

- Fuel reduction treatments are most likely to be successful if they are planned within a landscape context that takes into account historical burning patterns, rates of fuel accumulation, and the scale of treatment needed for the particular landscape.
- Successful fuel reduction treatments to prevent severe and/or large wildfires in the western U.S. will address the reduction of surface fuels, ladder fuels, and canopy bulk density.
- Both prescribed fire and thinning can be used to reduce fuels. However, thinning techniques have little effect on surface fuels, while prescribed fire alone has little effect on canopy density.
- Fuels reduction treatments must be repeated at intervals appropriate for the particular landscape to maintain effectiveness.
- Tilting treatments should be accompanied by post-thinning surface fuel reduction treatments.

GOOD

SHOULD ADDITIONAL THINNING OCCUR OR PRESCRIBED FIRE USED EVERY 5 YEARS?

SAF CAN HELP DETERMINE WHAT IS SAFE WITH 40 MPH DIABLO WINDS
COPPICE STUMP TREATED WITH GARLON TO PREVENT SUCKER GROWTH

SAF CAN HELP CLARIFY STUMP CONTROL OPTIONS

AWARD WINNER
CHABOT CAMPGROUND THINNED OF ALL STEMS <8” TO SAVE LARGER TREES IN 2012
There is a natural, fire-safe, and cost cycle for East Bay planted eucalyptus and pine forests.

100 to 150 years

1900

New Forest

Thinning

Stand Management Protection

Harvest Planning

2050

Native Woodlands

$1 per tree

$8,000 per acre

$1,500 per year per acre

$2 per tree

$3,000 per tree

SAF can help clarify long-term eucalyptus and pine management costs.
THERE ARE AT LEAST TWO OPTIONS
FOR A FIRE-SAFE STANDARD OF CARE
FOR TREES IN THE EAST BAY HILLS

HILLER HIGHLAND’S MANAGES 16 ACRES OF OAK GRASSLAND AS DEFENSIBLE SPACE FOR $1,000 PER ACRE

WEST SIDE OF CALDECOTT TUNNEL CANYON

PINES REMOVED

NOT VERY FLAMMABLE
UC- RESTORED CLAREMONT CANYON AREA AT AN AVERAGE COST OF $4,000 PER ACRE

EUCALYPTUS REMOVED

SIGNPOST #29 SOUTH SIDE OF THE CANYON

NOT VERY FLAMMABLE
EBMUD GRIZZLY RIDGE FUELBREAK FIRE MITIGATION PROJECT UNDERWAY

EBMUD REMOVAL AND THINNING OF SUCKERS AND SEEDLINGS ABOVE EVACUATION ROUTE AND PG&E LINES

CNPS AND EBMUD JOINT SKYLINE GARDENS FUELBREAK PROJECT WITHOUT USE OF ROUNDUP
SIBLEY ISLAND RIDGETOP FUELBREAK WITH EUCALYPTUS AND PINE REMOVED

NOT VERY FLAMMABLE
WHILE WE ARGUED, WE THOUGHT NOTHING COULD TOP THE 1991 OAKLAND TUNNEL FIRE

THREE OF THE MOST DESTRUCTIVE WILDFIRES IN CALIFORNIA HISTORY

18,804 STRUCTURES
86 FATALITIES
153,400 Acres Burned
$16.5 BILLION IN COSTS
PG&E BANKRUPTCY
WE KNOW CA. HAS EXPERIENCED 14 OF IT’S MOST DESTRUCTIVE FIRES IN THE LAST 15 YEARS.

2 FIRES IN ALAMEDA COUNTY HAVE HELD THE STATE RECORD FOR MOST DESTRUCTIVE FOR 94 YEARS. SANTA BARBARA, NAPA/SOLANO, AND BUTTE COUNTIES HAD THE RECORD FOR ONE YEAR EACH.

<table>
<thead>
<tr>
<th>Year</th>
<th>Month</th>
<th>Name</th>
<th>County</th>
<th>Acres</th>
<th>Structures</th>
<th>Deaths</th>
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<td>November</td>
<td>Camp</td>
<td>Butte</td>
<td>153,336</td>
<td>18,804</td>
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<td>Tubbs</td>
<td>Napa, Solano</td>
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<td>October</td>
<td>Tunnel</td>
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<td>1,600</td>
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<td>2003</td>
<td>October</td>
<td>Cedar</td>
<td>San Diego</td>
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<td>2,820</td>
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<td>Carr</td>
<td>Shasta, Trinity</td>
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<td>1,604</td>
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<td>October</td>
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<td>December</td>
<td>Thomas</td>
<td>Ventura, Santa Barbara</td>
<td>281,893</td>
<td>1,063</td>
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<td>October</td>
<td>Old</td>
<td>San Bernadino</td>
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<td>Jones</td>
<td>Shasta</td>
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<td>954</td>
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<td>September</td>
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<td>Amador, Calaveras</td>
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<td>Napa, Solano</td>
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<td>641</td>
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<td>Fountain</td>
<td>Shasta</td>
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<td>San Diego</td>
<td>90,440</td>
<td>548</td>
<td>8</td>
</tr>
<tr>
<td>2017</td>
<td>October</td>
<td>Redwood Valley Complex</td>
<td>Mendocino</td>
<td>36,623</td>
<td>546</td>
<td>9</td>
</tr>
</tbody>
</table>

MOST STATE RECORD YEARS FOR DAMAGE

1 YEAR
27 YEARS
67 YEARS
THE NEW REALITY

Increasing concentration of humans on the landscape is the underlying culprit behind the overall uptick of wildfires in California. "Climate change is exacerbating the problems, but population growth is a more direct cause". More people living in wildland areas means more potential ignition sources.

JON KEELY, UCLA FIRE ECOLOGIST

WE KNOW THERE WILL BE AN INCREASING FIRE PROBLEM

MORE PEOPLE + HEAT + WILDFIRE + NO STRATEGY = MORE HOMES LOST

Global temperatures ramp up

Average global surface temperature by year

Baseline is the average global surface temperature for the years 1951 through 1980.

Source: NASA

Los Angeles Times
THE MEDIA AND AGENCIES ARE DESCRIBING FIRE IN FOOTBALL FIELD SPEED AND VEG. HEIGHT

CAL FIRE AND THE MEDIA SAY BIG FIRES NOW MOVE BY FOOTBALL FIELD SPEED

<table>
<thead>
<tr>
<th>Year</th>
<th>Fire Incident</th>
<th>FBF/10 Sec.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1971</td>
<td>MISSION VALLEY FIRE</td>
<td>6</td>
</tr>
<tr>
<td>1991</td>
<td>OAKLAND TUNNEL FIRE</td>
<td>11</td>
</tr>
<tr>
<td>2017</td>
<td>TUBBS FIRE</td>
<td>60</td>
</tr>
<tr>
<td>2018</td>
<td>CAMP FIRE</td>
<td>3</td>
</tr>
</tbody>
</table>

FLAMES CAN BE 3 TO 5 times vegetation height

RESIDENTS AND POLITICIANS MIGHT PAY ATTENTION IF THEY KNEW

WUI FIRES CAN PRODUCE UP TO 150’ of flame height & 2,000 degrees of heat
EVERYONE WILL BE EVACUATED EARLY WHEN A WILDFIRE GETS HOT. THEN FIRE FIGHTING WILL HAPPEN WHEN PEOPLE ARE SAFE AND ACCESS IS POSSIBLE.

RESIDENTS SHOULD KNOW THAT THEIR HOME WILL BE ON ITS OWN.

1. THEY MUST GET IT READY NOW TO POTENTIALLY SURVIVE A WILDFIRE
2. HOPING THEIR HOME WILL BE THERE WHEN THEY RETURN
WHAT IS THE STRATEGY FOR PREPARING THE WUI FOR THE NEXT BIG FIRE??

ABAG WHITE PAPER 2018

Bay Area Wildland Urban Interface
Review of Risks, Plans, and Strategies

CODES EXIST FOR

HOME HARDENING
DEFENSIBLE SPACE
HOME HARDENING
THREE ADDITIONAL KEY STRATEGIES WERE LISTED IN THE ABAG WHITE PAPER

Bay Area Wildland Urban Interface
Review of Risks, Plans, and Strategies

Strategy Types to Reduce Vulnerability

1. **Reduce Exposure through Land Use Planning** – Where homes, businesses, and infrastructure are located can be a powerful way to reduce wildfire risk. Different locations within a city can present drastically different wildfire risk. Locating important assets in areas of low fire risk is a straightforward method to reduce risk. When using land use as a fire management tool it is critical that other considerations like flood risk, transit access, and economic feasibility are considered as well.

2. **Reduce Exposure through Vegetation Management** – Vegetation is a key variable in determining the fire risk for a specific area. In the Wildland Urban Interface, vegetation (grass, shrubs, trees) is the primary fuel source that powers fires. Most strategies to address vegetation occur in three sub-areas:
   - **Defensible Space** – The amount of vegetation and its proximity to a home has a large influence on the likelihood the structure will be damaged by a wildland fire. Depending on the local conditions, many strategies recommend anywhere between 30 and 100 feet of vegetation clearance around structures, with the distance largely dependent on the slope of the property as well as the vegetation height.
   - **Fuel Breaks** – Areas can be greatly protected when there is a break in vegetation. Across the region fire crews use paved roads, dirt roads, and fire break specific lines to provide a barrier where a fire may have a reduced chance of spreading. Any fuel break by itself will not stop a wildfire, but they provide an increased probability of success for fire suppression activities.
   - **Open Space Management** – The makeup of vegetation in the wildland and open space areas can drastically change the likelihood and intensity of fires. Types of vegetation and densities of vegetation can change fire characteristics. If fires are less intense in wildland areas, they’re less likely to spread in an uncontrollable manner.

3. **Reducing Fragility by Hardening Assets** – Certain construction methods and materials are less likely to ignite when they are exposed to fire, or when embers from a nearby fire are present. By making structures or infrastructure less likely to catch fire, there is a greater likelihood assets will survive nearby fires. This is also sometimes referred to as structure ignitability.
I BELIEVE THERE ARE AT LEAST 11 SMART WUI VEGETATION MANAGEMENT OBJECTIVES

TO PROVIDE FOR SAFE EVACUATION ROUTES

TO PROVIDE SAFE SPACE FOR FIRE FIGHTERS AT THE WUI COMMUNITY EDGE

TO MANAGE OR REMOVE HIGH-FIRE RISK PLANTED OR NATIVE VEGETATION

TO MANAGE OR REMOVE HIGH-FIRE RISK FLAMMABLE INVASIVE’S

TO REDUCE FIRE HEAT AND EMBER SPREAD NEAR COMMUNITIES

TO PROTECT VALUES AT RISK

TO PROVIDE AND MAINTAIN BEAUTIFUL, FIRE-SAFE AREAS WHERE PEOPLE CHOOSE TO LIVE

TO PLAN BASED ON THE LAST BIG FIRE AND HOW THAT FIRE COULD POSSIBLY BEHAVE TODAY IN THE EAST BAY

TO ASSIST FEDERAL AND STATE LISTED SPECIES SURVIVE WILDFIRE

TO COMPLY WITH STATE ADOPTED WUI CODES, AND TO SATISFY CEQA AND EIS MITIGATION REQUIREMENTS
LIKE THE TUBBS FIRE OF 2017. COULD A SIMILAR TYPE OF FIRE OR SIEGE OF FIRES HAPPEN HERE IN THE EAST BAY?

FIRE STARTS HERE AT 9:43 PM ON OCTOBER 8.
DIABLO WINDS 60 mph
11 am

DIABLO WINDS 30 mph
11 am
DIABLO WINDS 60 mph

DIABLO WINDS 30 mph
DIABLO WINDS 60 mph

DIABLO WINDS 30 mph
CAL FIRE SPENT 2 DAYS SAVING LIVES BEFORE FIREFIGHTING COULD BEGIN

FIRE RUNS 12 MILES TO HERE AT 4:40 AM

DIABLO WINDS 30 mph

DIABLO WINDS 60 mph

CAL FIRE SPENT 2 DAYS SAVING LIVES BEFORE FIREFIGHTING COULD BEGIN

3,837 HOMES BURNED
73 BUSINESSES BURNED
43 FATALITIES
12,000 EVACUATED
36,800 ACRES BURNED

N. BAY SIEGE OF FIRES
COULD A 12 MILE LONG DIABLO WIND FIRE OR SIEGE OF FIRES OCCUR HERE?
WE LOOK FORWARD TO THE SOCIETY OF AMERICAN FORESTERS RECOMMENDATIONS FOR RESOLVING FUELS MANAGEMENT PINCH POINTS THAT WILL MAKE US SAFER FOR THE NEXT 50-YEARS.

2017
7,120 FIRES AND 506,000 ACRES

2018
6,300 FIRES AND 876,000 ACRES

MAYBE YES MAYBE NO! BUT OUR RESIDENTS WILL EXPECT THAT WE ARE ADEQUATELY PREPARED FOR WHATEVER HAPPENS.

WILL BE BUSY AND NEED HELP

WE LOOK FORWARD TO THE SOCIETY OF AMERICAN FORESTERS RECOMMENDATIONS FOR RESOLVING FUELS MANAGEMENT PINCH POINTS THAT WILL MAKE US SAFER FOR THE NEXT 50-YEARS.