

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"

**EAST BAY TIMES**  
**Sunday**  
WINNER OF THE 2017 PULITZER PRIZE FOR BREAKING NEWS REPORTING  
Bay Area News Group  
24/7 COVERAGE: EASTBAYTIMES.COM  
VOLUME 187, ISSUE 94  
\$2.50 000 SEPTEMBER 2, 2018

**NFL Kickoff:** Get ready for the season with our 72-page magazine previewing 49ers, Raiders, NFL  
Inside today's paper for subscribers

**'LIVING IN A GAS CAN'**  
**INFERNO: WHAT IF YOU'RE NEXT?**

**ASSESSING RISK**  
To map wildfire danger in the Bay Area and across the state, Cal Fire analyzed building development, fire behavior and fuels over a 30-50 year period. The latest assessment was issued in 2007, but the agency is working on updates to the maps.

Very high High Moderate

**Locations featured in this article**  
① Edgewood Ave and Sequoia Valley Road, Mill Valley  
② Lake Drive, Kensington  
③ Stetson Road and Soquel San Jose Road, Los Gatos

San Pablo Bay  
San Rafael  
Richmond  
Oakland  
San Francisco  
Hayward  
Fremont  
Palo Alto  
San Mateo  
Pacifica  
Half Moon Bay  
Suisun Bay  
Solano CO.  
Pittsburg  
Antioch  
Walnut Creek  
Concord  
Livermore  
Hayward  
Fremont  
Palo Alto  
Milpitas  
San Jose  
Santa Clara County  
Alameda County  
Contra Costa County

Clara Wood hauls out some clippings recently from Ye Olde School Trail, a firebreak that runs behind her house in Kensington.

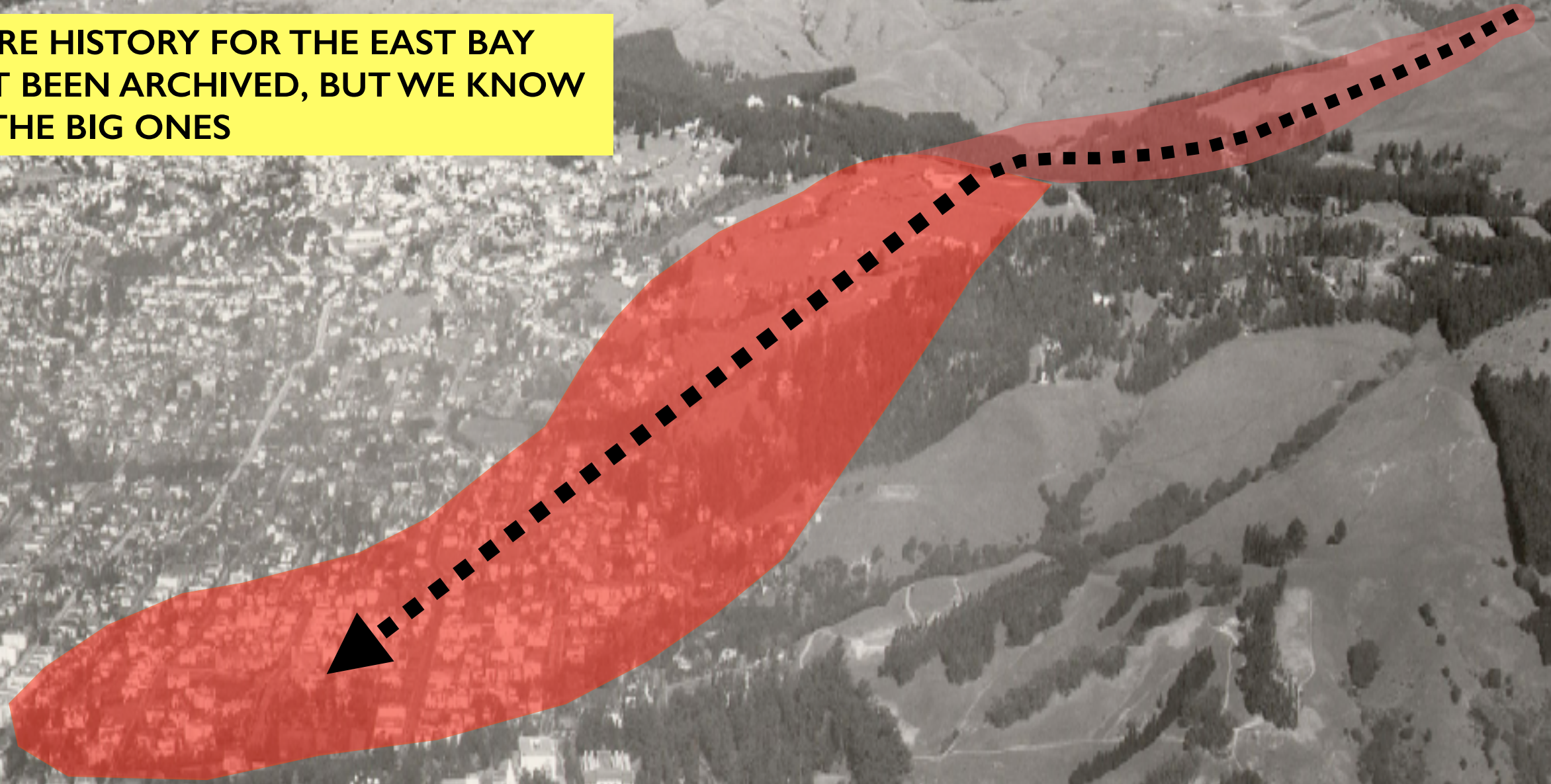
KARL MONDEN — STAFF PHOTOGRAPHER

For those living in wildfire country, it's not retreat — it's fight back

By Anna-Scfia Lesiv, John Woolfolk and Thomas Peele

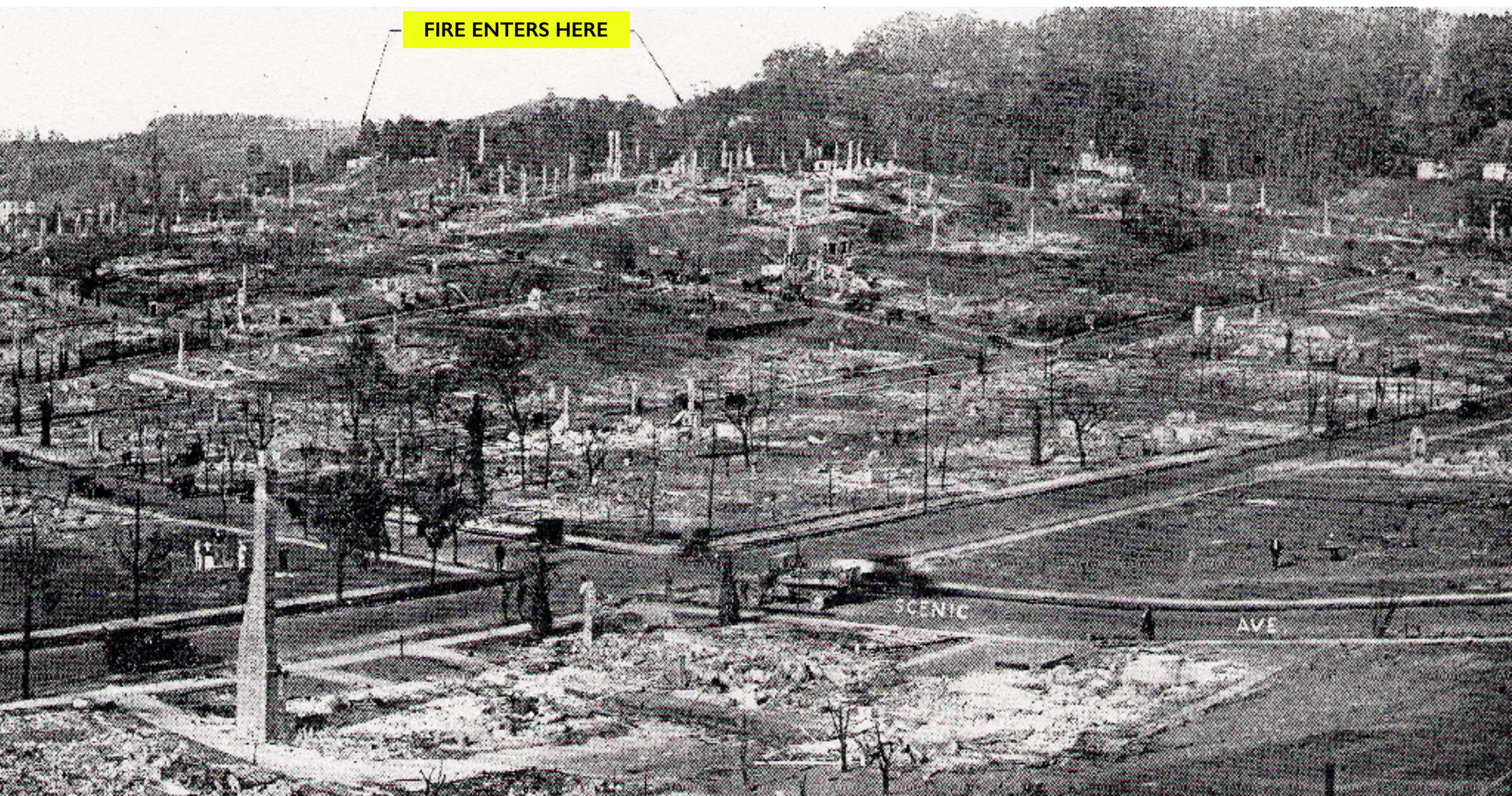


**EARLY FIRE HISTORY FOR THE EAST BAY  
HAS NOT BEEN ARCHIVED, BUT WE KNOW  
ABOUT THE BIG ONES**



**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**





**THE BERKELEY FIRE WAS CALIFORNIA'S MOST DESTRUCTIVE WILDFIRE FOR THE NEXT 67 YEARS**





1924 TO 1960



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%

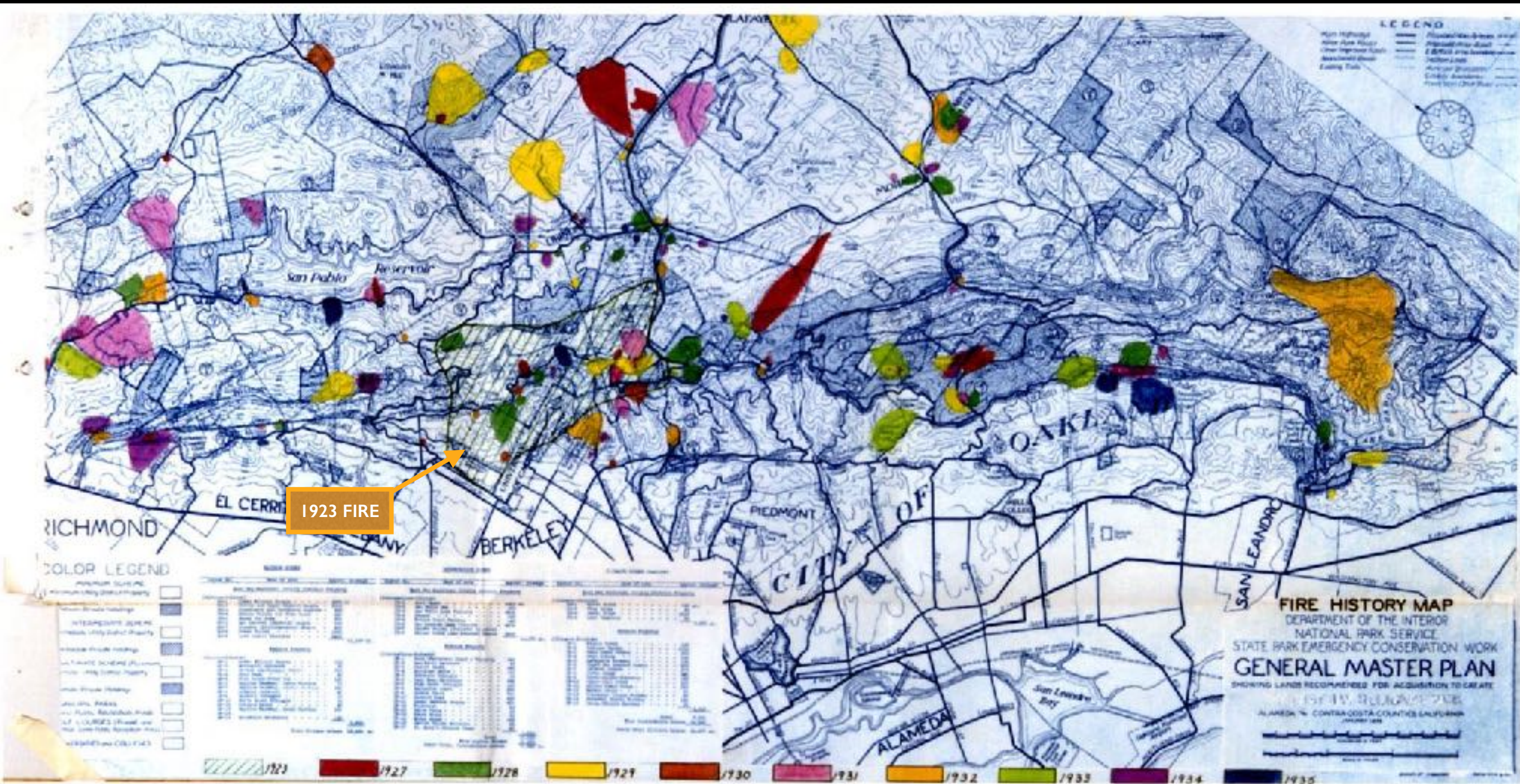
MANY FIRES WERE REPORTED IN THE NEXT 13 YEARS BY TWO NEW LOOKOUT TOWERS



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.





**NO MAJOR FIRES OCCURRED  
UNTIL THE FISH FIRE**

**CALIFORNIA AFLAME 1970**

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



**EVERYONE IN OAKLAND WAS SURPRISED ON SEPTEMBER 22, 1970 WHEN  
A FIRE DESTROYED 36 HOMES AND DAMAGED 37 HOMES IN 70 MINUTES**



# 1970 FISH FIRE

CLAREMONT CANYON

FOUR CORNERS

FISH RANCH ROAD

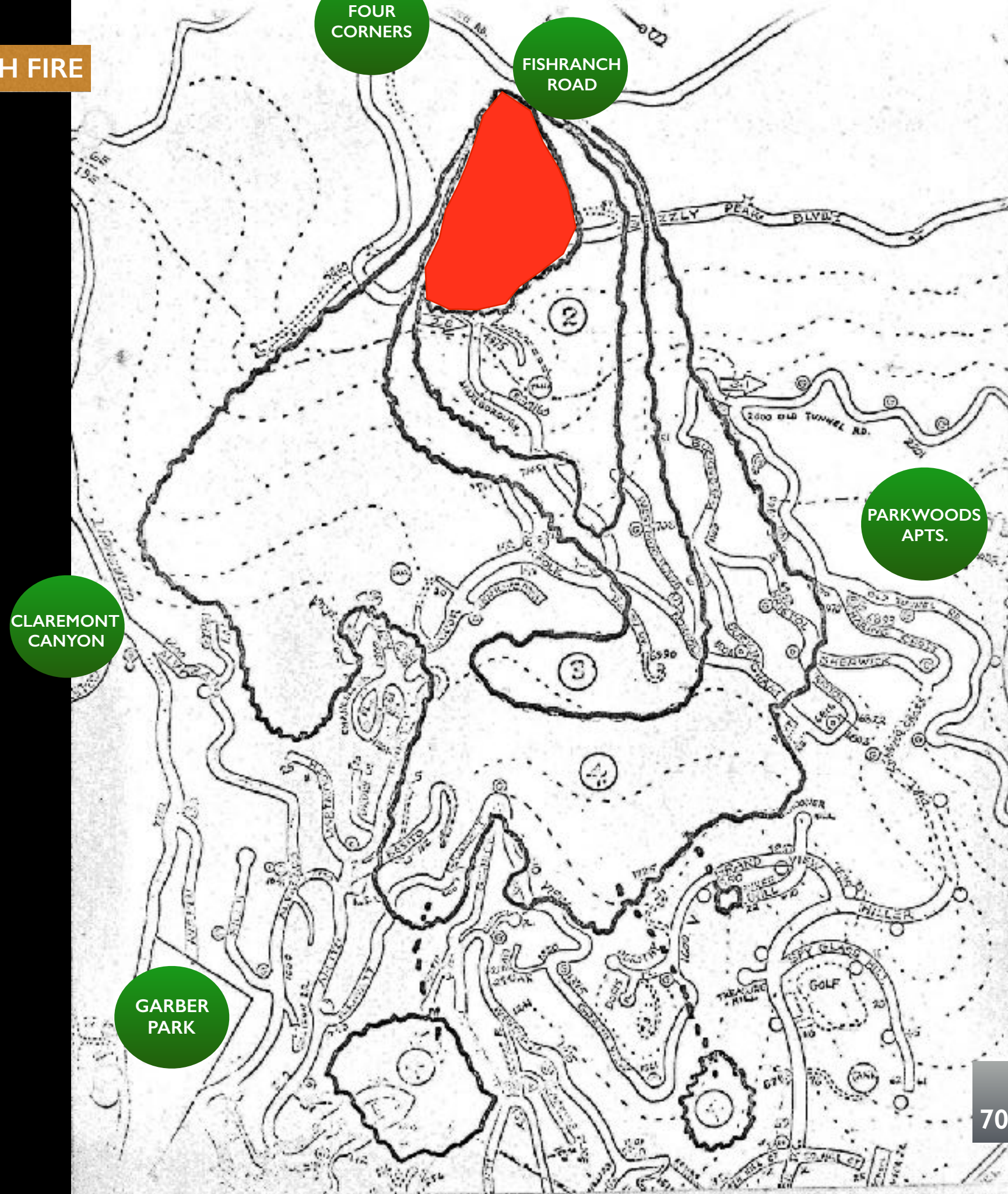
PARKWOOD APTS.

CALDECOTT TUNNEL





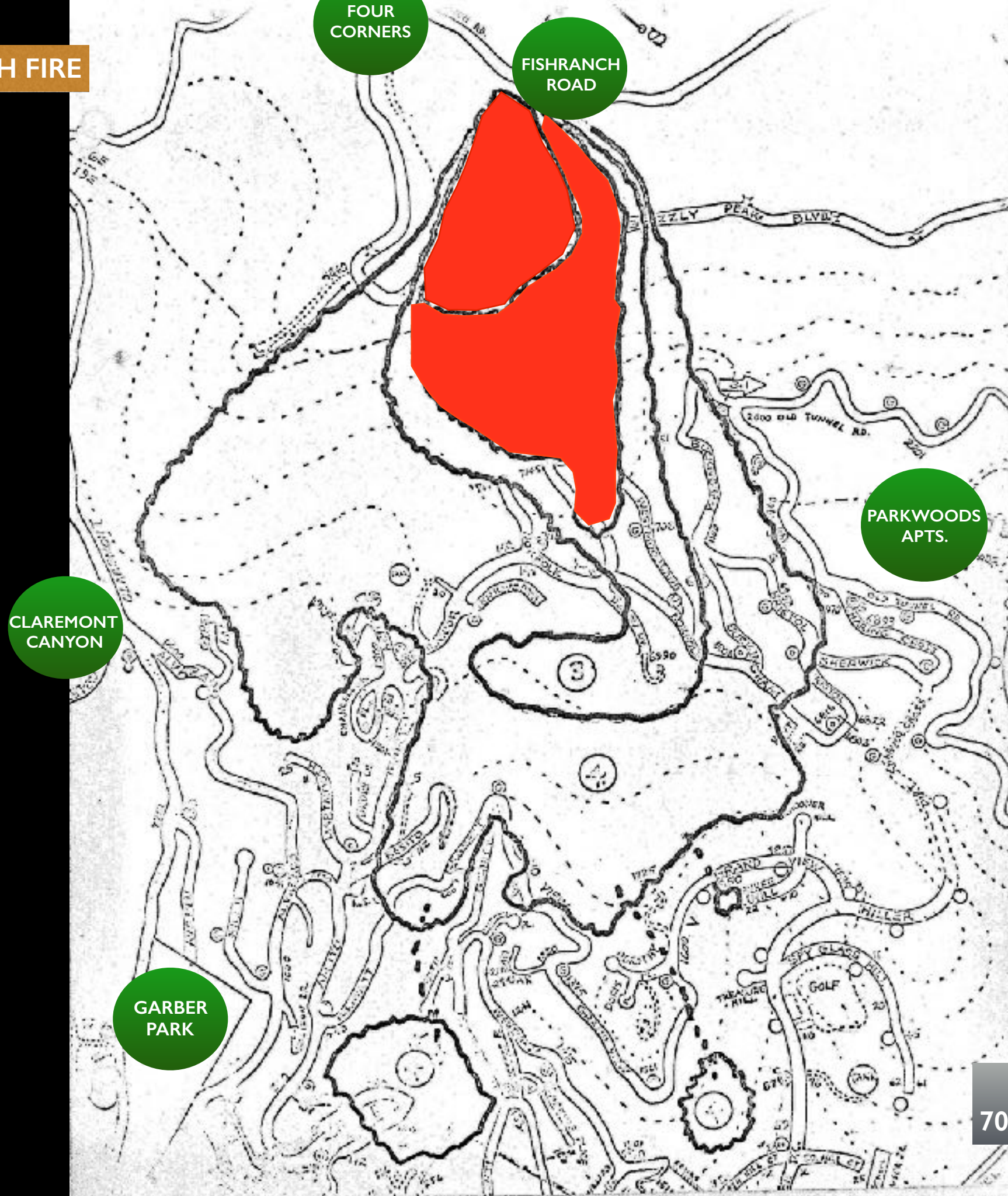
1970 FISH FIRE



WIND DRIVEN,  
70 MINUTE FIRE SPREAD



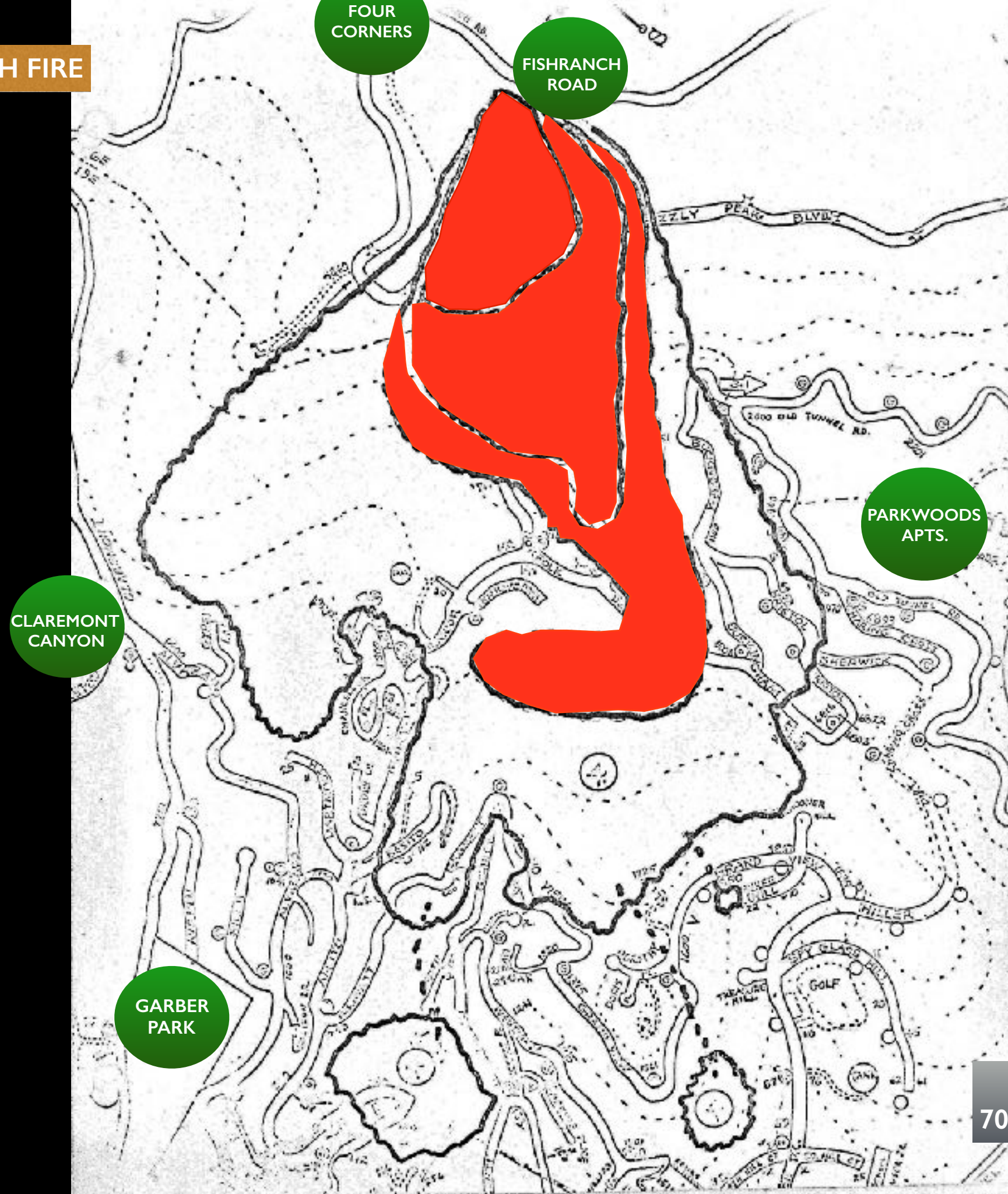
1970 FISH FIRE



WIND DRIVEN,  
70 MINUTE FIRE SPREAD



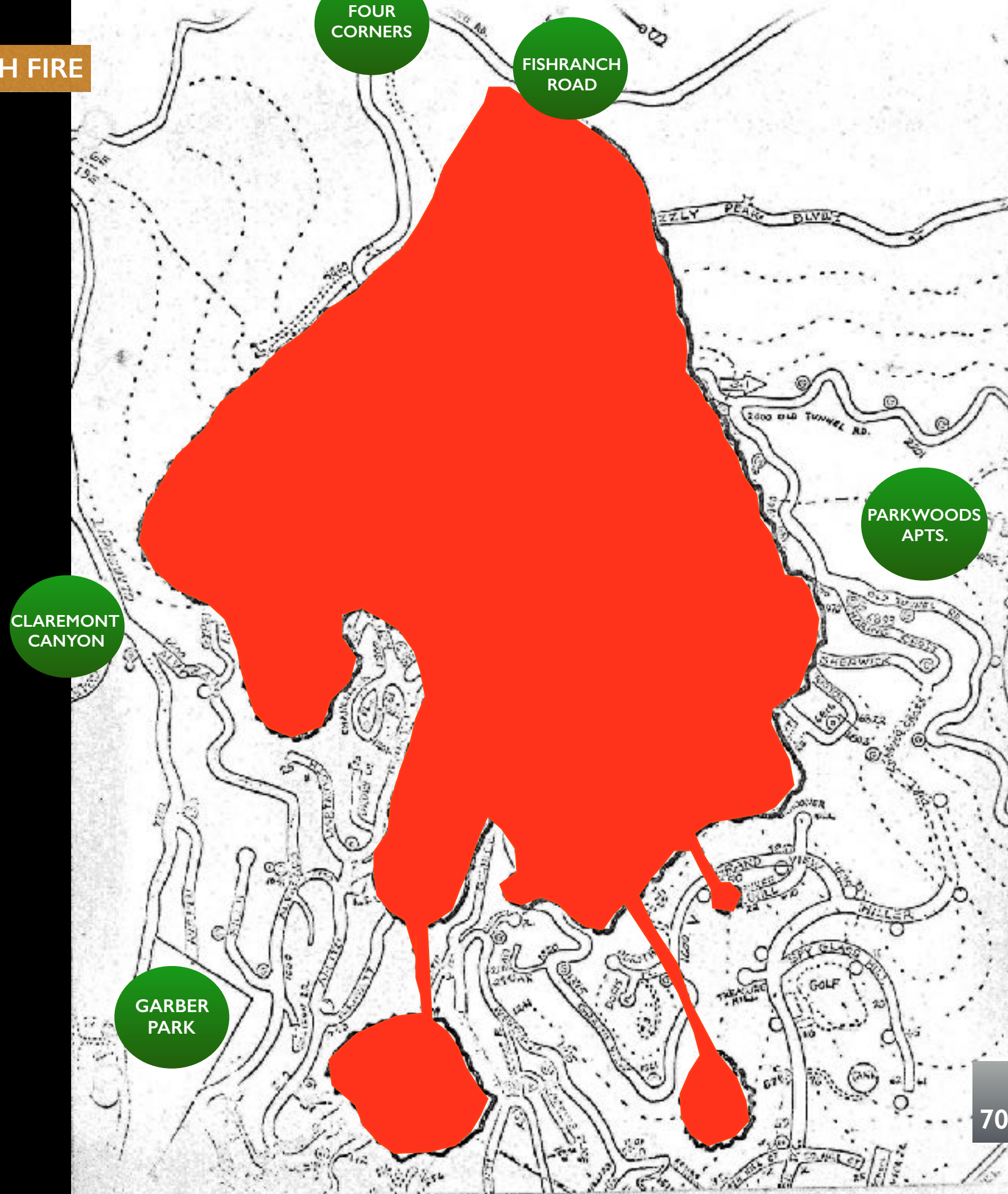
1970 FISH FIRE



WIND DRIVEN,  
70 MINUTE FIRE SPREAD



1970 FISH FIRE



WIND DRIVEN,  
70 MINUTE FIRE SPREAD

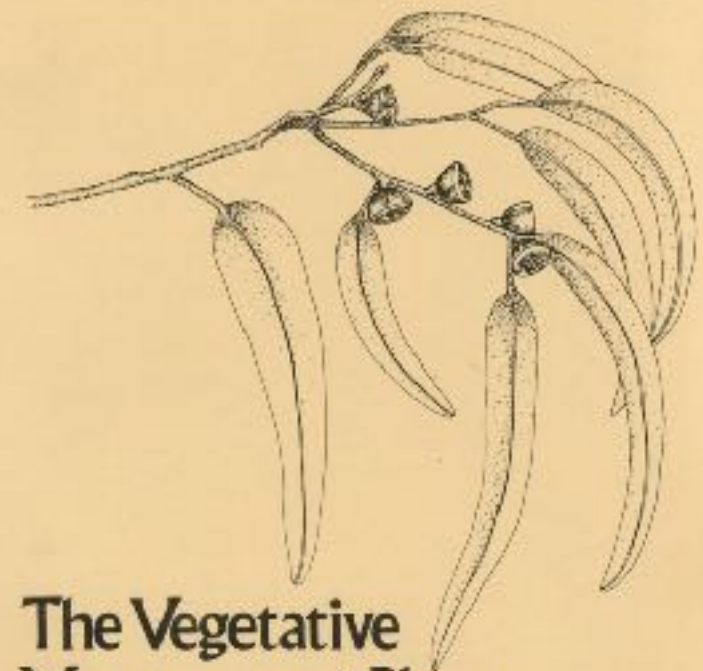


## 1972 FREEZE



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**

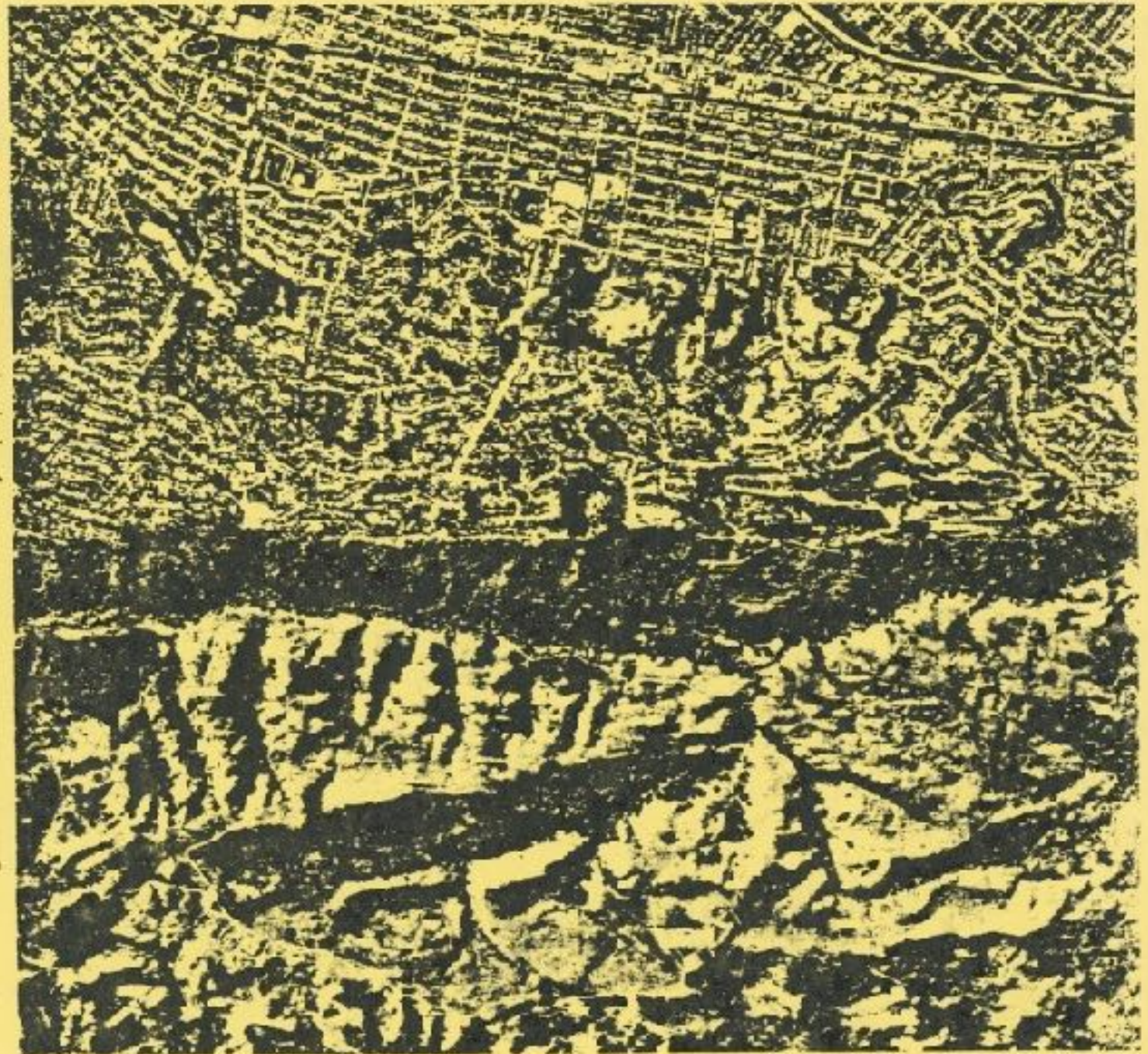
**5 MAYORS DEMANDED THAT A BLUE RIBBON COMMITTEE BE FORMED TO DEVELOP A NEW FIRE PLAN**



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**

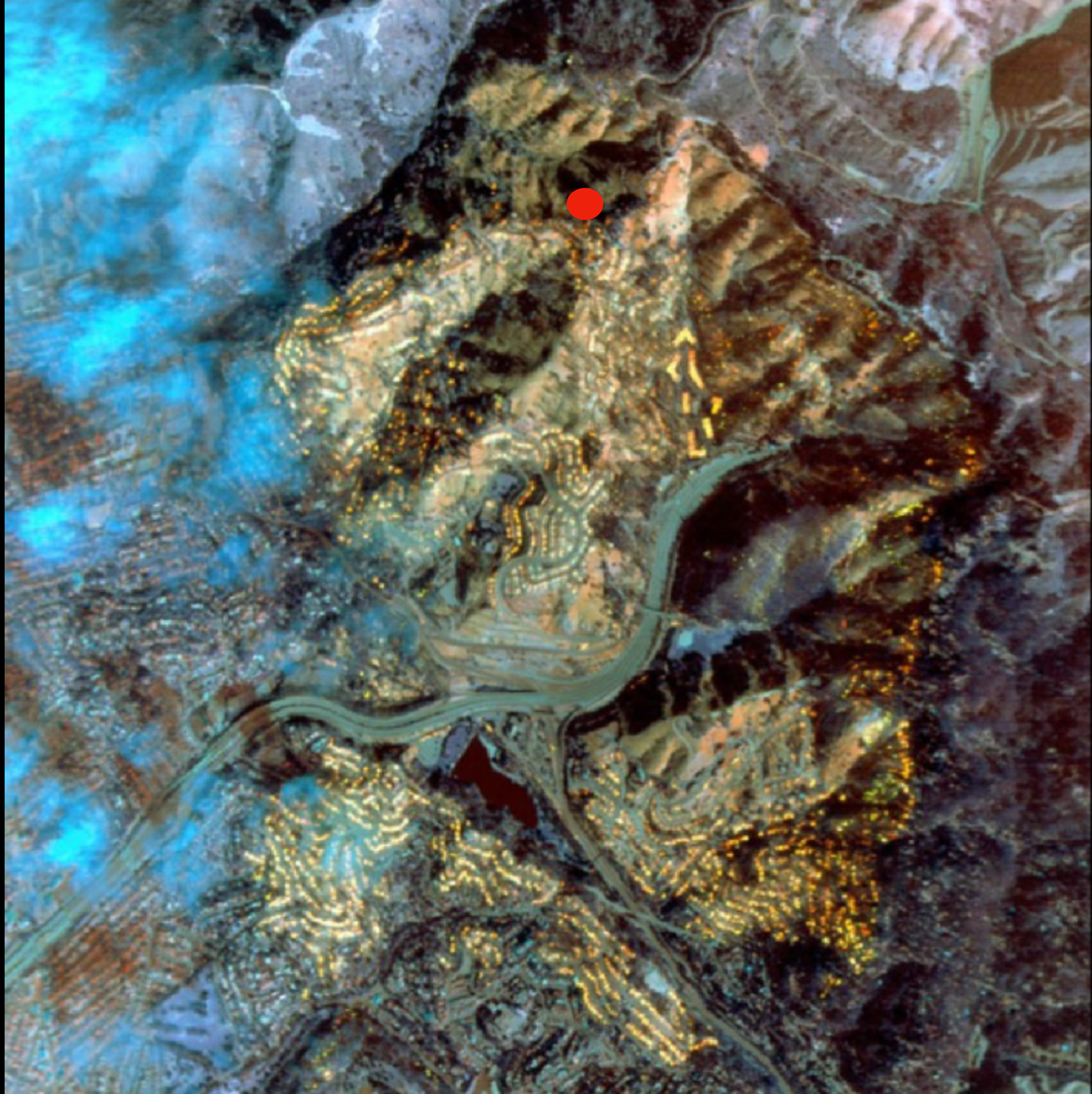
# 1982 REPORT OF THE **BLUE RIBBON** URBAN INTERFACE FIRE PREVENTION COMMITTEE



**106 PAGES**



9 YEARS LATER



OAKLAND WAS SURPRISED ON OCTOBER 20, 1991 BY A RAGING FIRESTORM IN TUNNEL CANYON



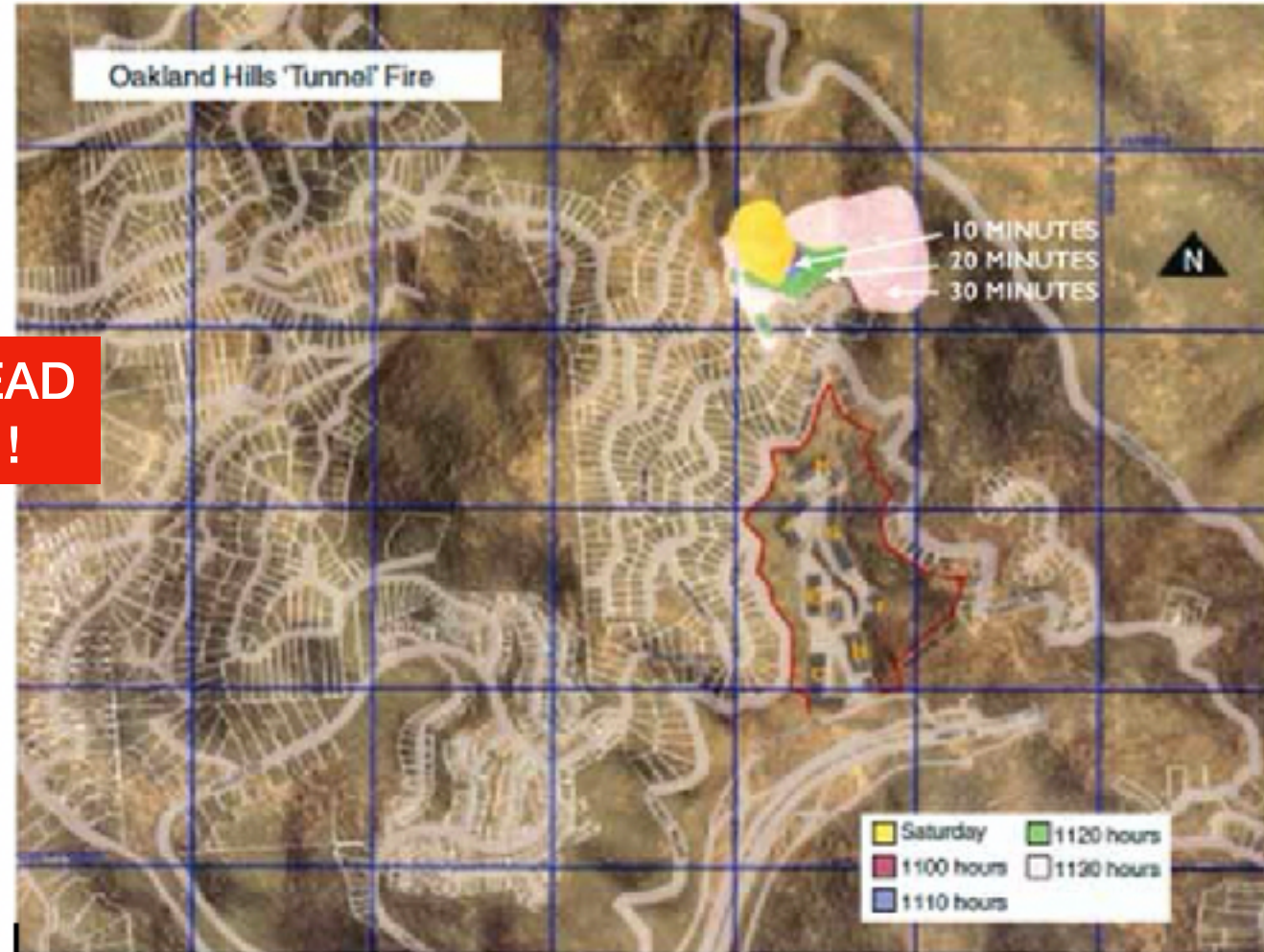
IT BEGAN HERE



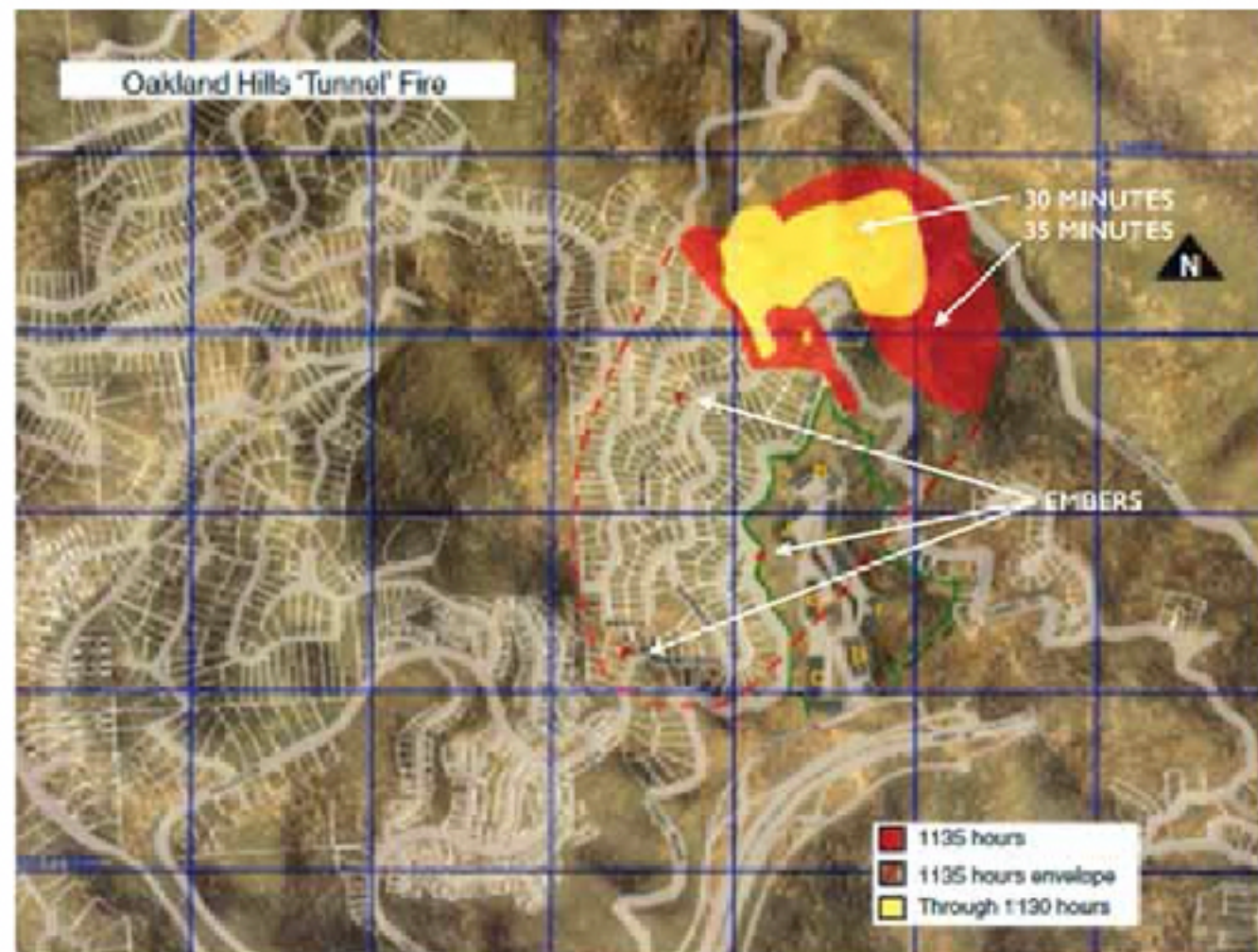
SATURDAY FIRE- NO WIND. SUNDAY REKINDLE- 40MPH DIABLO WINDS.



**FIRE AND EMBER SPREAD  
WAS UNIMAGINABLE !**



**FIRST 30 MINUTES**



**NEXT 5 MINUTES**



**MANY RESIDENTS HAD JUST MINUTES TO FLEE FOR THEIR LIVES.**

**AND, THEY HAD TO EVACUATE WITHOUT A WARNING OR A CLEAR PLAN !**



**NEXT 5 MINUTES**

**FIRST RESPONDERS WERE TOTALLY INVOLVED IN EVACUATING RESIDENTS, AND COULD NOT FIGHT FIRE UNTIL THE WINDS CHANGE**



**NEXT 25 MINUTES**



SAT. FIRE  
 11:15  
 11:30  
 12:00  
 1:00  
 2:00  
 3:00  
 4:00

# OAKLAND/BERKELEY HILLS

FIRE OF  
 OCTOBER 20, 1991

ANNEX D  
 ESTIMATED  
 FIRE SPREAD

O.E.  
 CALIF.  
 FIRE  
 &  
 RESCUE  
 DIVISION

MORNING WIND

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

6 LANE FREEWAY

BERKELEY

ROBLE CT.

OAKLAND

CITY BOUNDARY  
 FIRE BOUNDARY  
 FIRE ORIGIN

SCALE  
 METERS  
 500 1000










MORAGA

PIEDMONT

MORAGA

MAP  
 PREPARED BY  
 DAVID KEHRLEIN  
 GIS/MAPPING  
 COORDINATOR  
 CRAIG CASTANEDA  
 ASSISTANT



-  SAT. FIRE
-  11:15
-  11:30
-  12:00
-  1:00
-  2:00
-  3:00
-  4:00
-  5:00

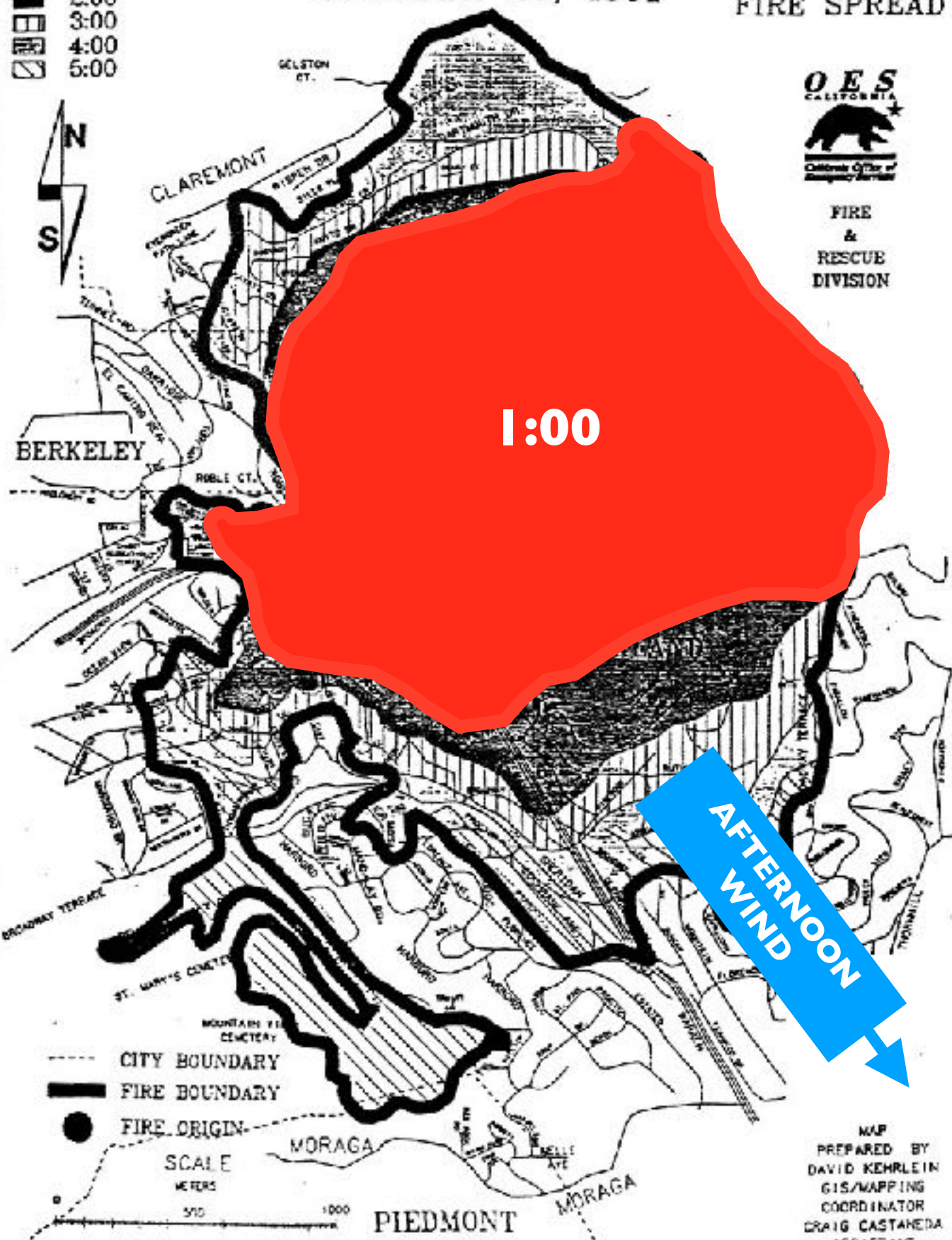
# OAKLAND/BERKELEY HILLS

FIRE OF  
OCTOBER 20, 1991

ANNEX D  
ESTIMATED  
FIRE SPREAD



FIRE  
&  
RESCUE  
DIVISION





	SAT.	FIRE
	11:15	
	11:30	
	12:00	
	1:00	
	2:00	
	3:00	
	4:00	
	5:00	

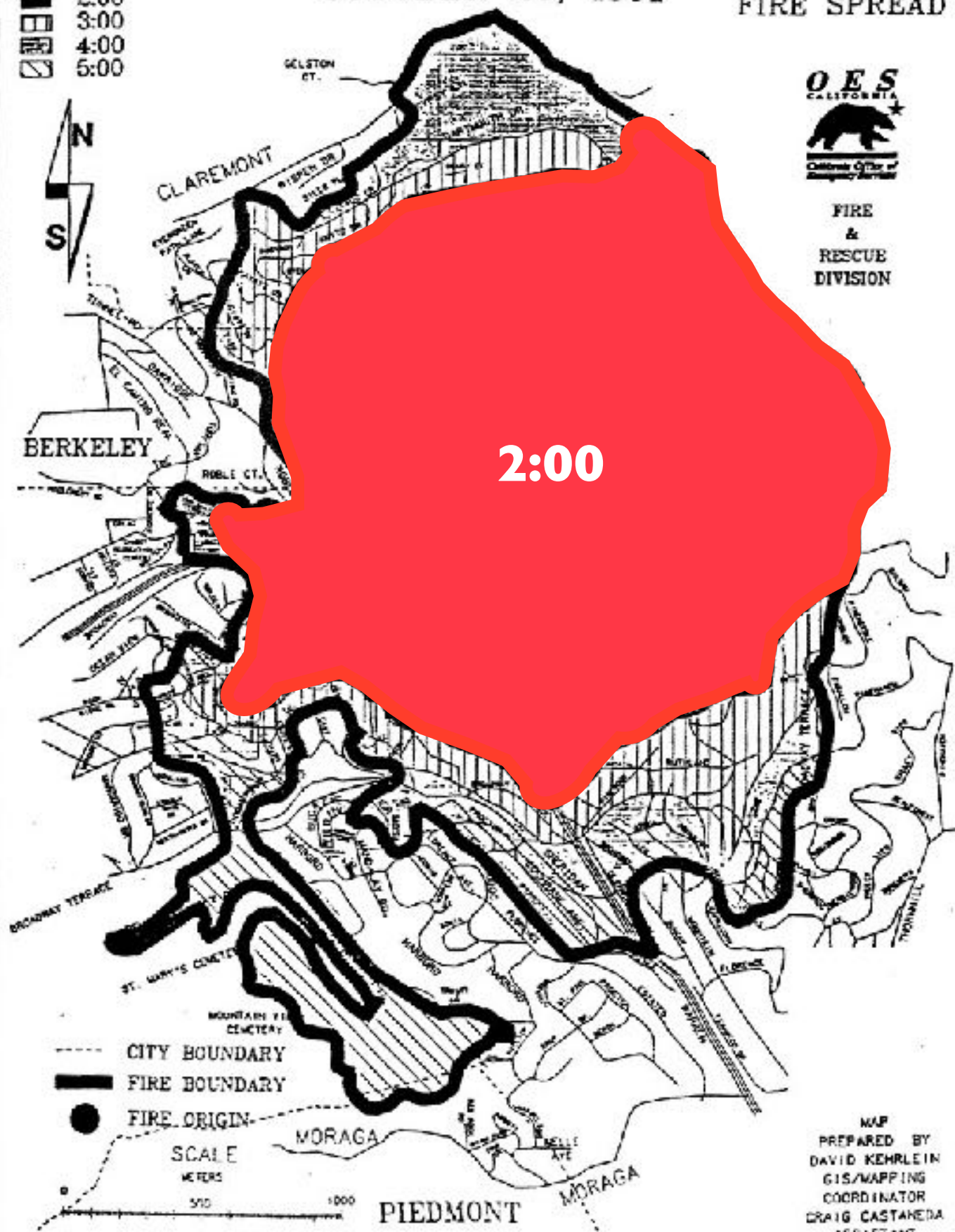
FIRE OF  
OCTOBER 20, 1991

## ANNEX D

### ESTIMATED FIRE SPREAD



FIRE  
&  
RESCUE  
DIVISION





	SAT.	FIRE
	11:15	
	11:30	
	12:00	
	1:00	
	2:00	
	3:00	
	4:00	
	5:00	

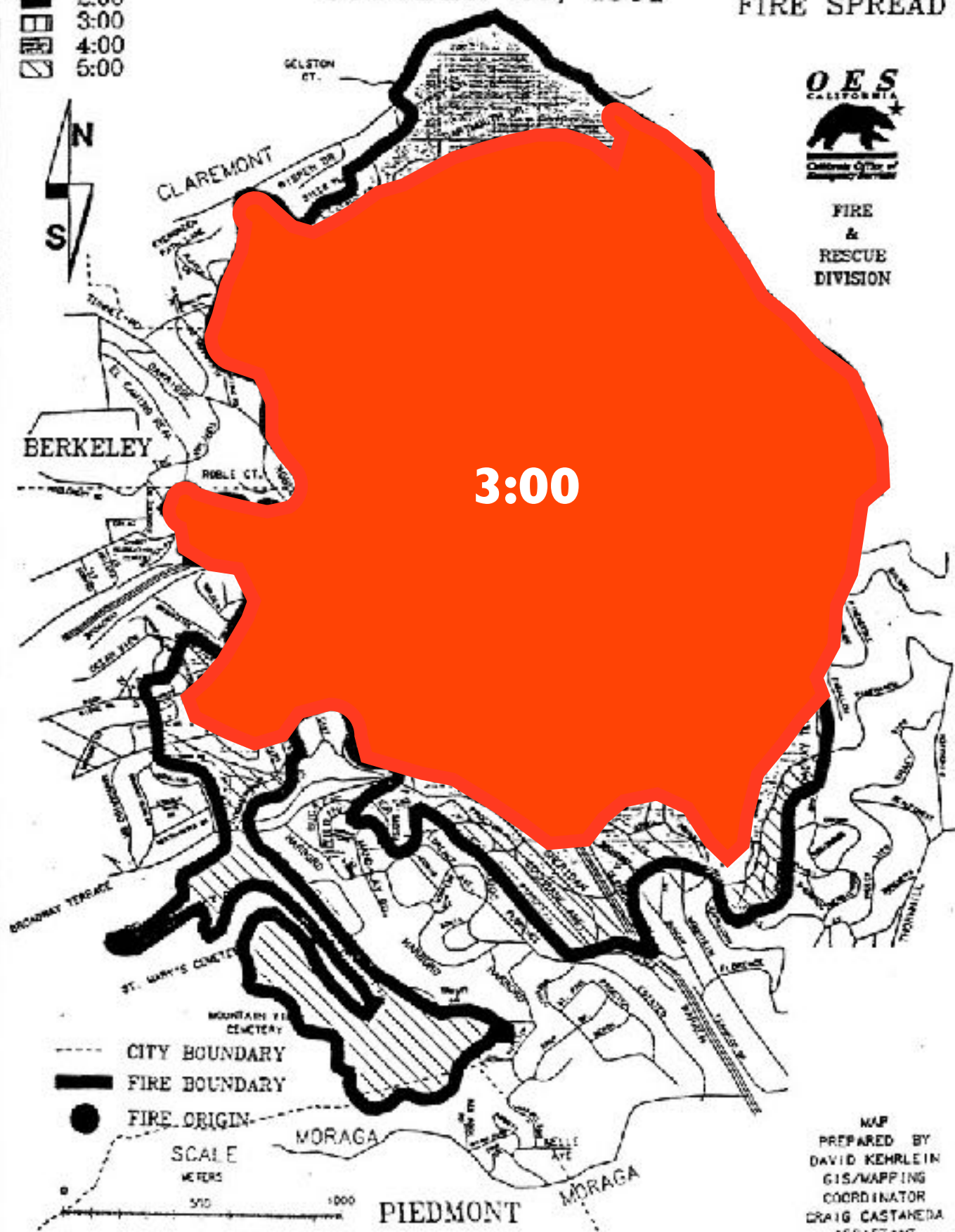
FIRE OF  
OCTOBER 20, 1991

## ANNEX D










### ESTIMATED FIRE SPREAD



FIRE  
&  
RESCUE  
DIVISION





-  SAT. FIRE
-  11:15
-  11:30
-  12:00
-  1:00
-  2:00
-  3:00
-  4:00
-  5:00

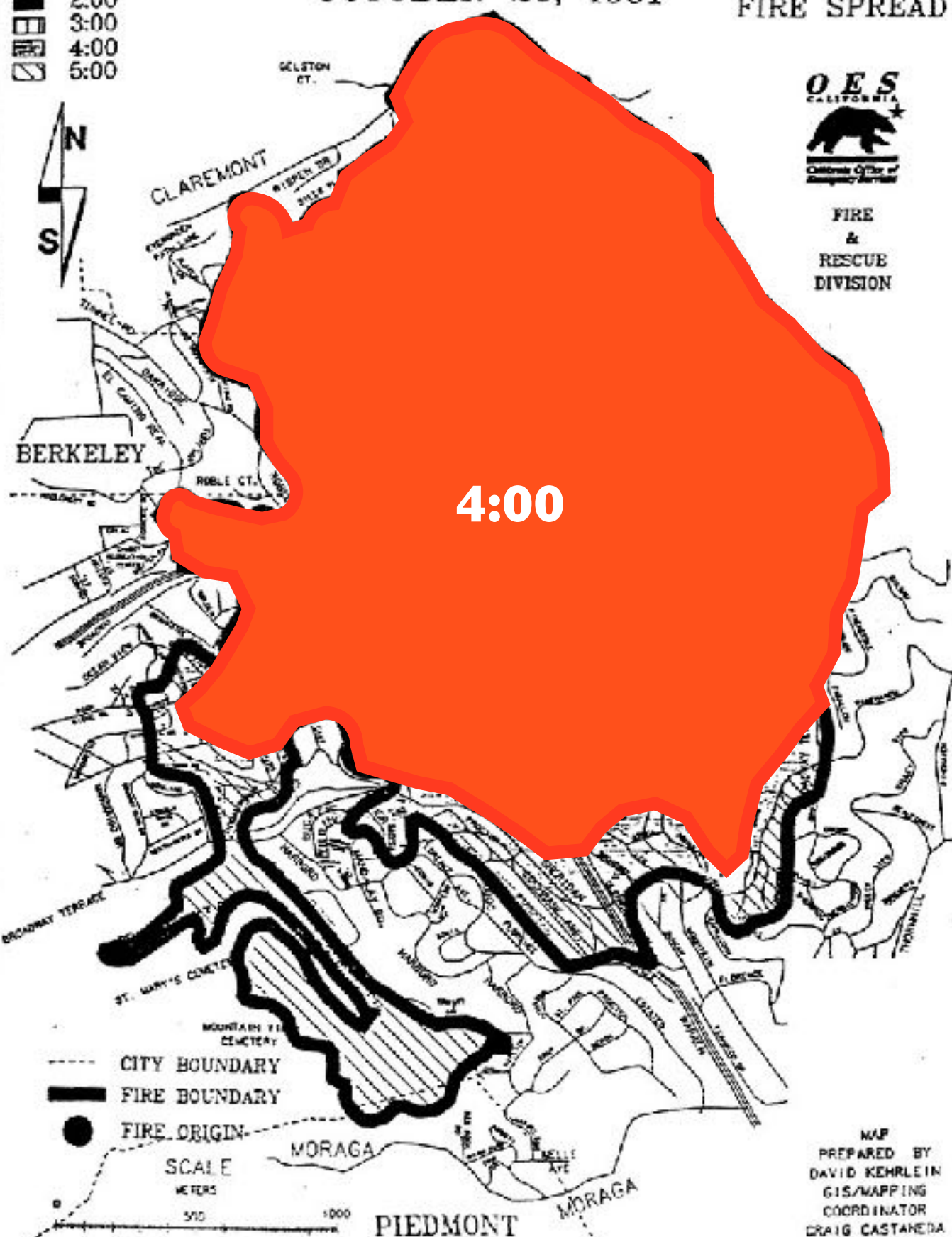
# OAKLAND/BERKELEY HILLS

FIRE OF  
OCTOBER 20, 1991

ANNEX D  
ESTIMATED  
FIRE SPREAD



FIRE  
&  
RESCUE  
DIVISION





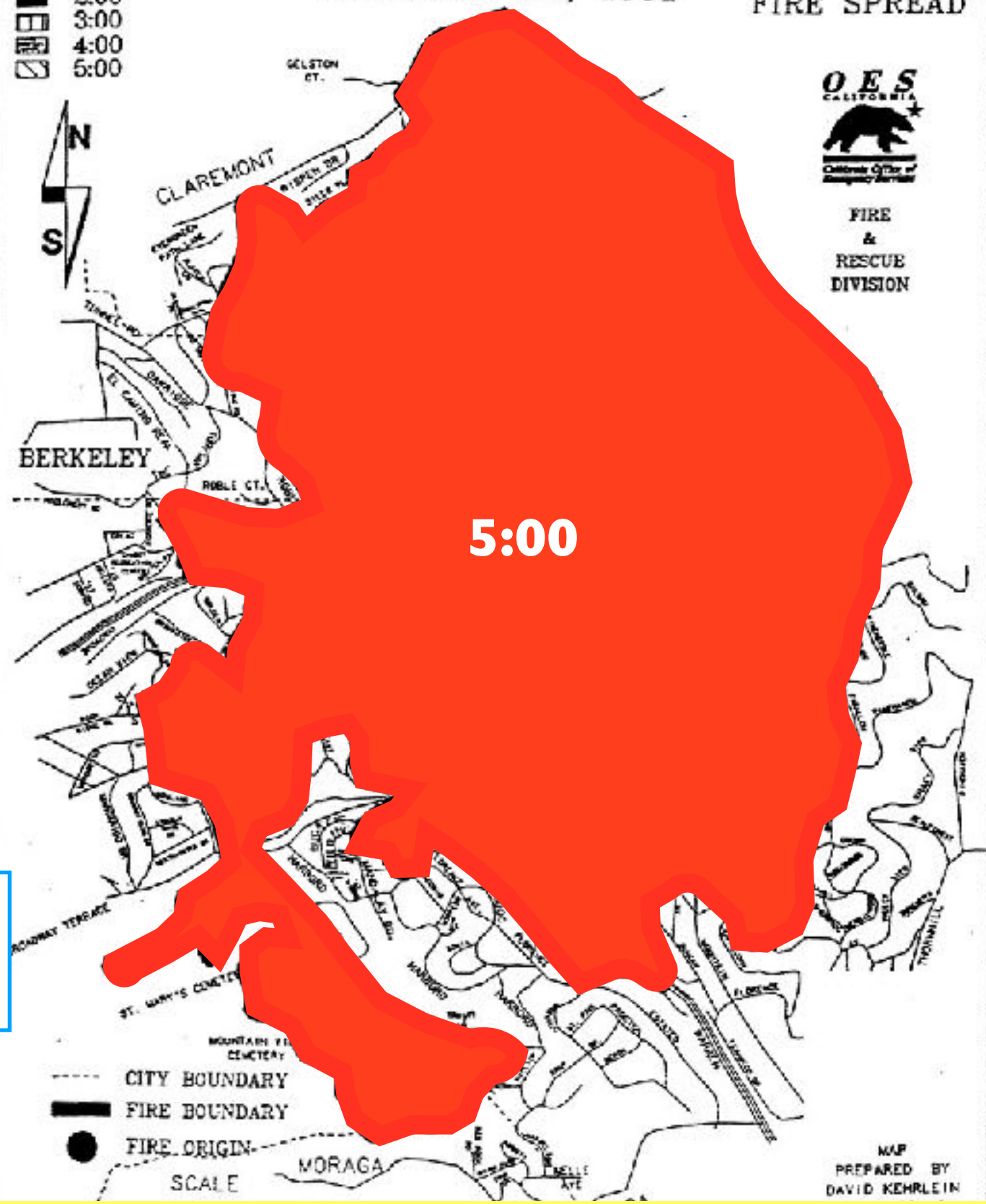
- SAT. FIRE
- 11:15
- 11:30
- 12:00
- 1:00
- 2:00
- 3:00
- 4:00
- 5:00

# OAKLAND/BERKELEY HILLS FIRE OF OCTOBER 20, 1991

ANNEX D  
ESTIMATED  
FIRE SPREAD



FIRE  
&  
RESCUE  
DIVISION



5:00

- CITY BOUNDARY
- FIRE BOUNDARY
- FIRE ORIGIN

SCALE

MAP  
PREPARED BY  
DAVID KEHRLEIN

450 ENGINES AND  
1,500 FIREFIGHTERS  
RESPOND BY DAYS END

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



BEFORE

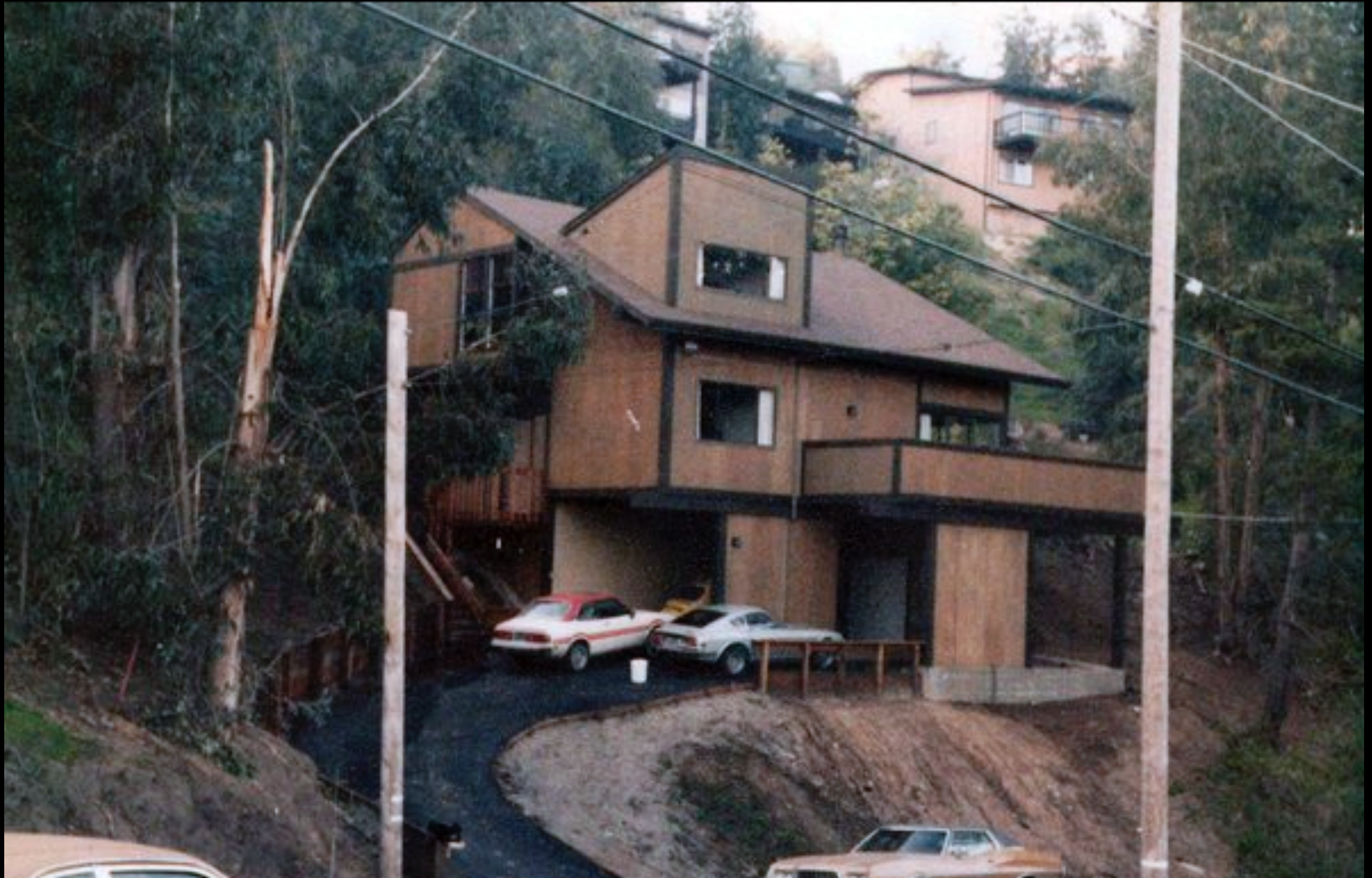


AFTER



ALL ON FIRE WITHIN 30 MINUTES





A FRIENDS HOME ON BUCKINGHAM WITH PINE AND EUCALYPTUS BEFORE THE 1991 FIRE





**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**





TUNNEL CANYON





HILLER HIGHLANDS





NORTH THORNHILL CANYON





ROCKRIDGE





ALVARADO AND VICINTE





CLAREMONT CANYON



**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 !**



Fire Hazard Mitigation Program  
&  
Fuel Management Plan  
for the  
East Bay Hills

May 1995



View of the East Bay Hills: Berkeley-Kensington border south to Oakland-San Leandro border



Please continue on back cover



# Technical Appendices

Fire Hazard Program  
&  
Fuel Management Plan  
for the  
East Bay Hills

May 1995

Hazard Assessment

Wildland Mitigation

Urban-Wildland Intermix Mitigation

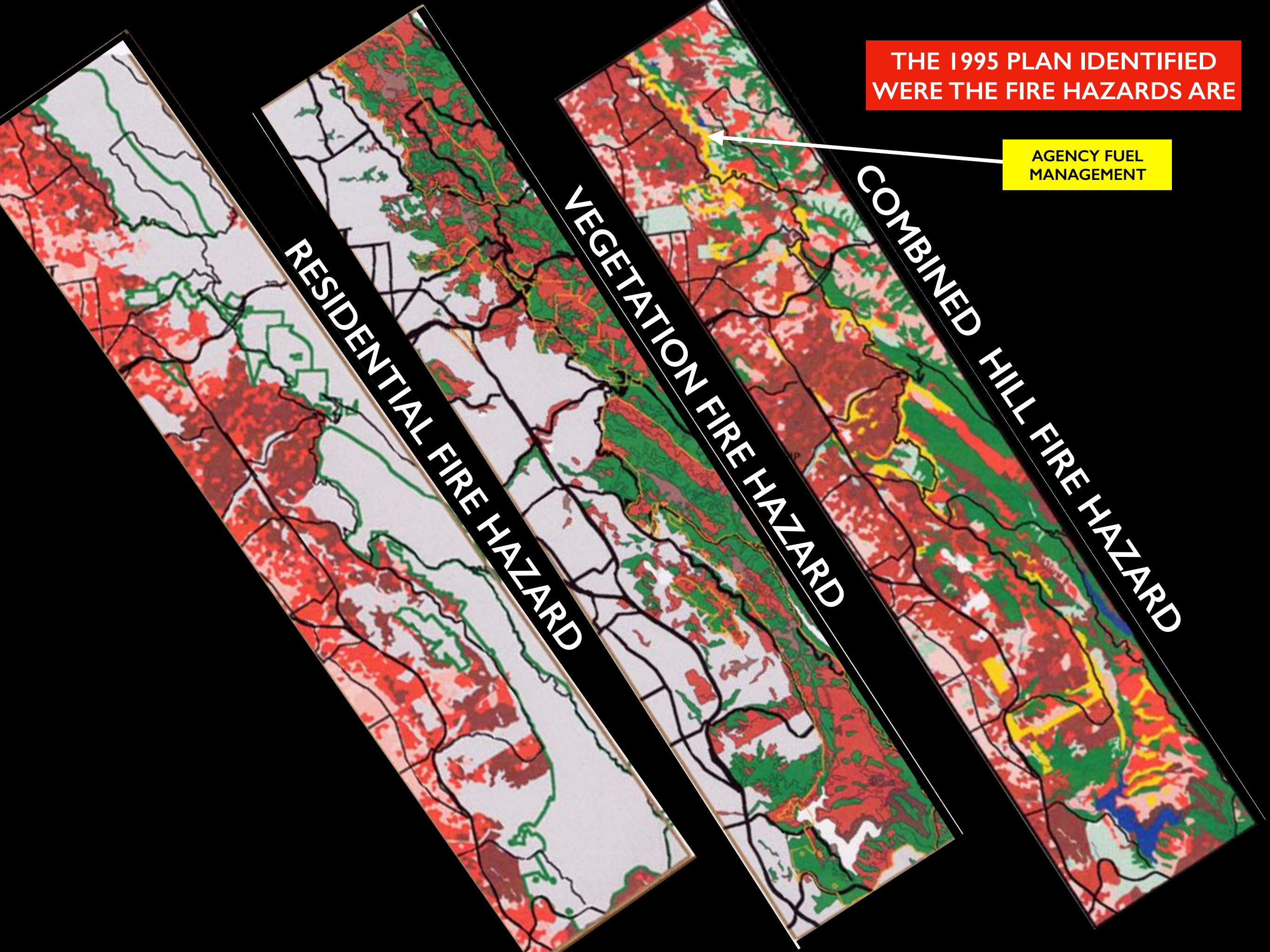
Policy Programs

Background Materials



THE 1995 PLAN IDENTIFIED  
WHERE THE FIRE HAZARDS ARE

AGENCY FUEL  
MANAGEMENT

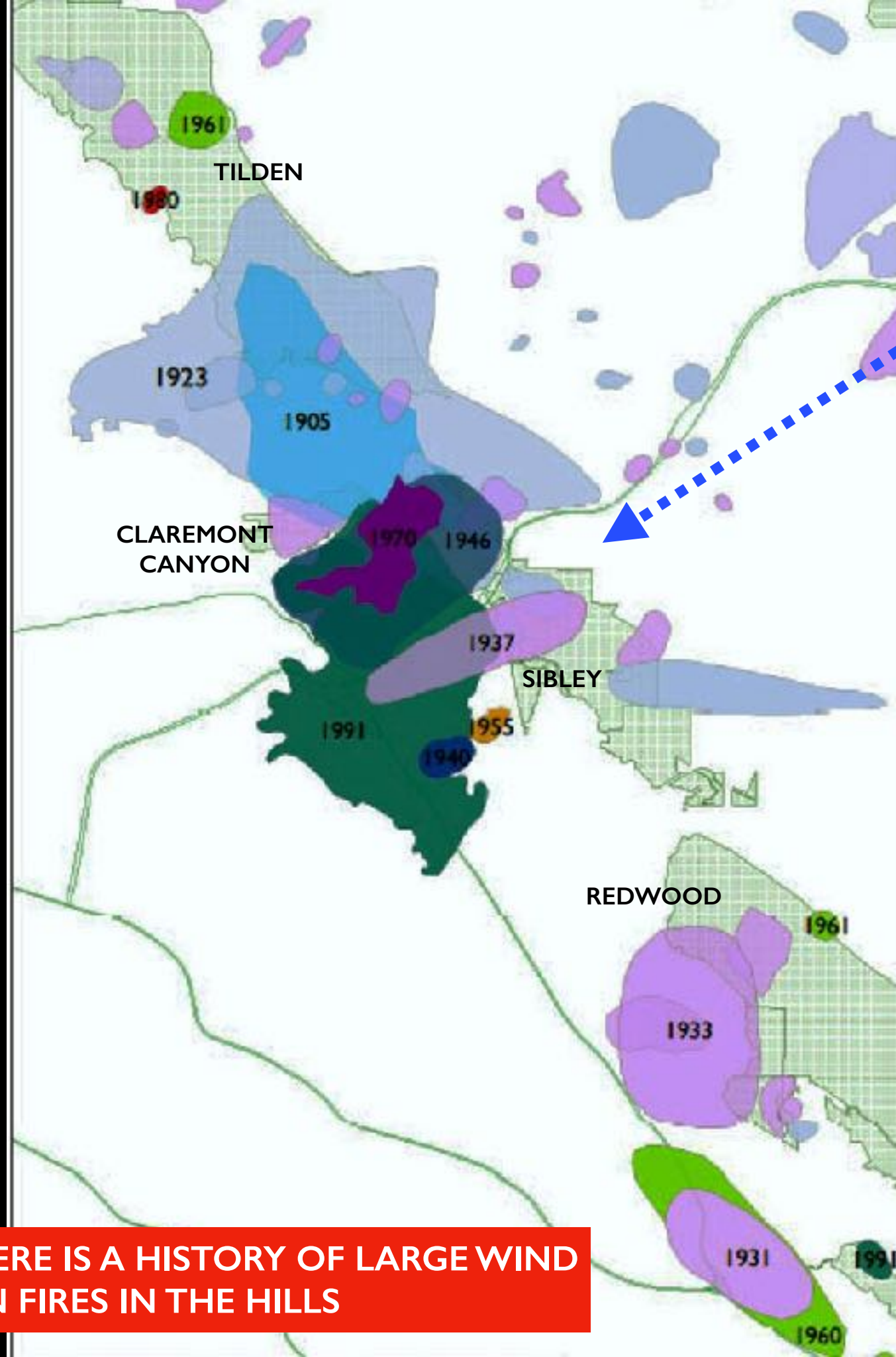


RESIDENTIAL FIRE HAZARD

VEGETATION FIRE HAZARD

COMBINED HILL FIRE HAZARD

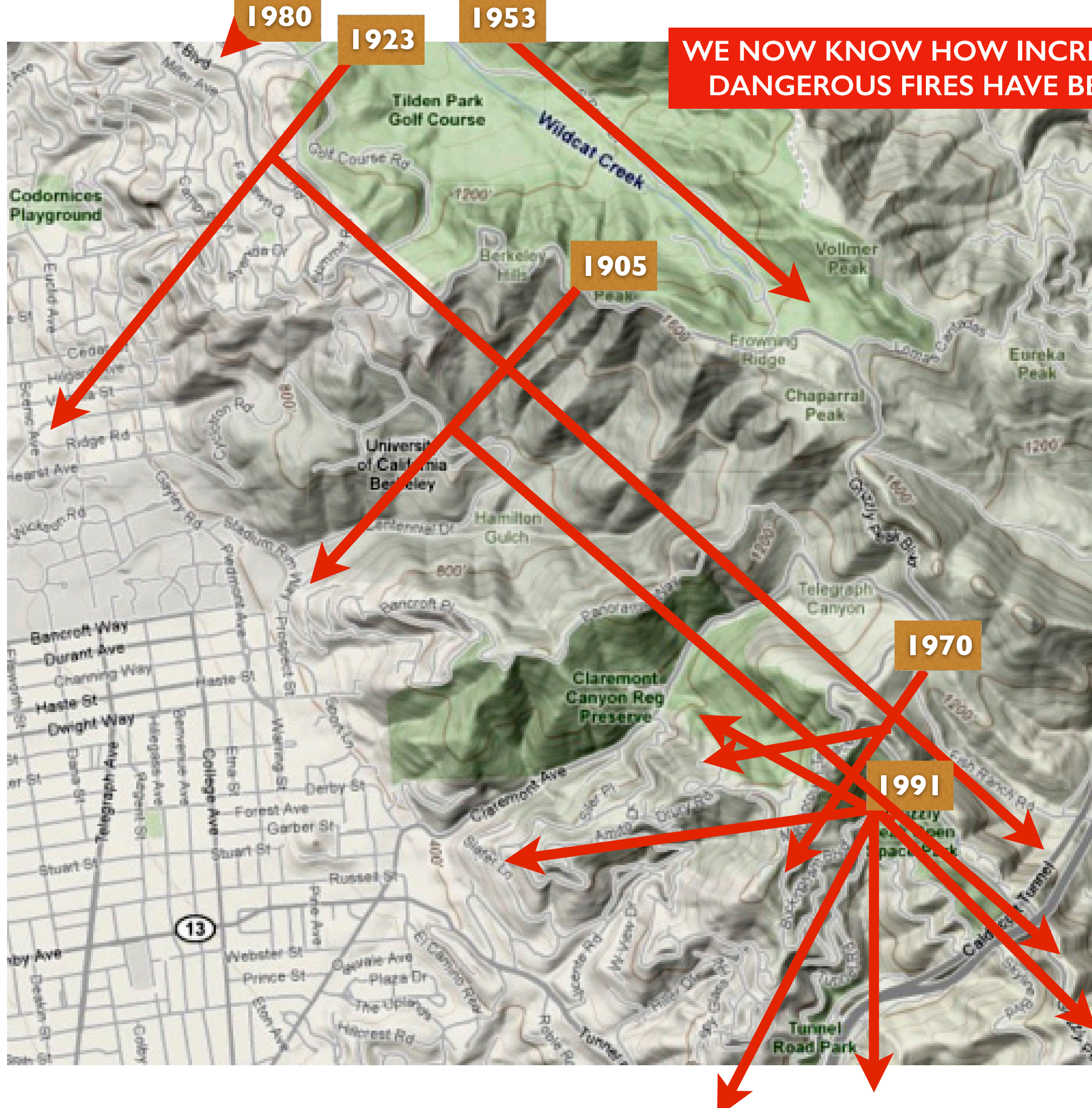




DIABLO WINDS

WE NOW KNOW THERE IS A HISTORY OF LARGE WIND  
DRIVEN FIRES IN THE HILLS





1980

1923

1953

1905

1970

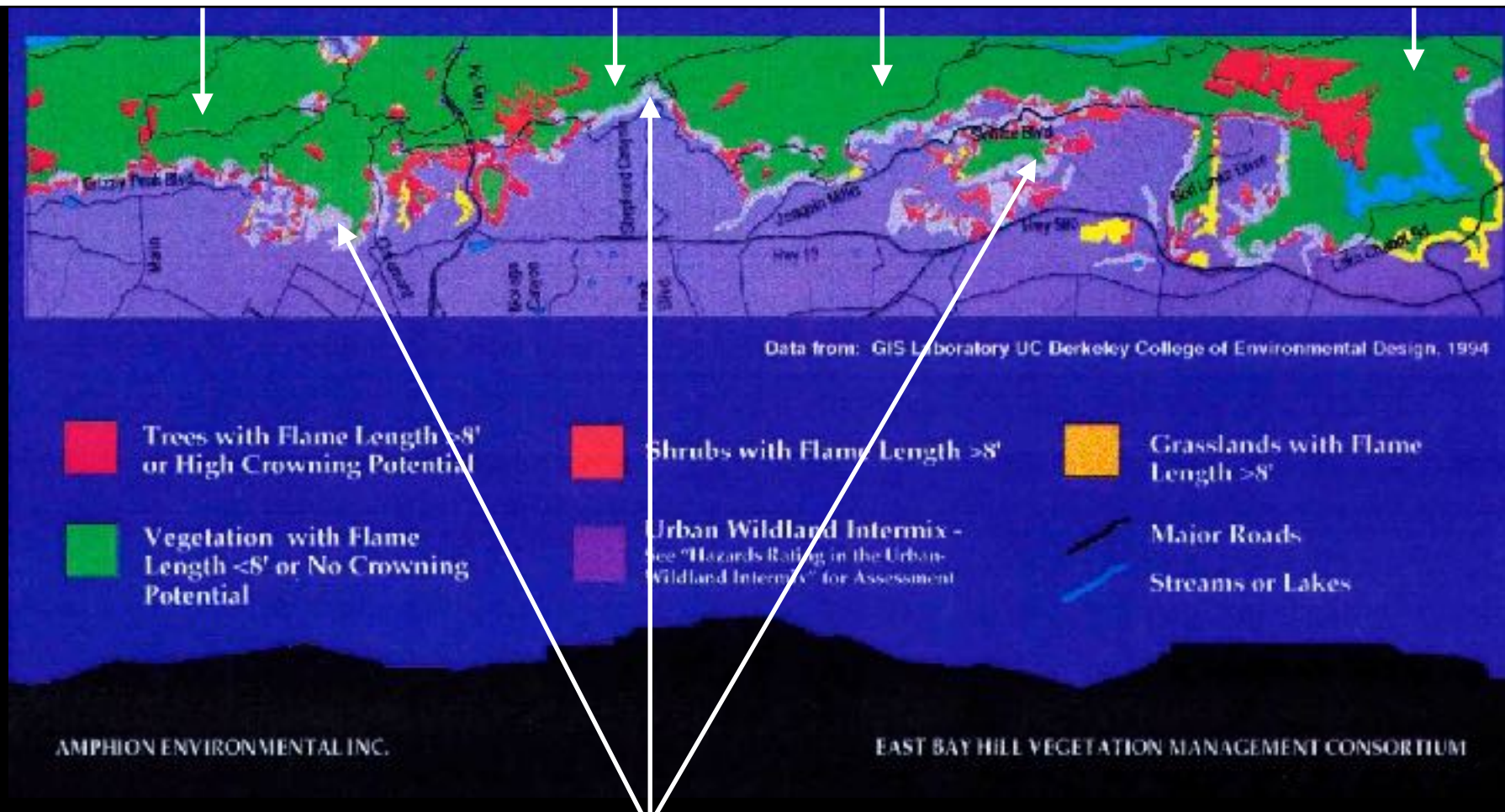
1991

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

FIRE FIGHTERS WOULD WORK TO SAVE EMBER RESISTANT HOMES WITH DEFENSIBLE SPACE IN RESIDENTIAL AREAS



THE JOINT AGENCY 1995 HEF PLAN WAS DEBATED FOR 5 YEARS AND EVENTUALLY TOSSED

## REGIONAL FIRE MITIGATION PLANNING

- 1995- **5 YEARS OF ENVIRONMENTAL DEBATE WITHOUT AGREEMENT** ON ENVIRONMENTAL DETAILS, EUCALYPTUS TREES, THE 500' BUFFER ZONE, LANDSLIDES, SPECIAL RESOURCE PROTECTION, PROJECT COSTS, AND THE LACK OF AN EIR.
- 2000- **40 MEMBER TEMESCAL GROUP AGREES ON NEW PLAN/EIR OUTLINE** ENT. THEY ARE ABLE TO REACHED AGREEMENT ON AN UPDATED JOINT AGENCY FIRE PLAN OUTLINE AND AND OUTLINE FOR A PROJECT EIR. THE PARK BOARD AGREED TO SUPPORT THE PLAN OUTLINE AND TO SEEK FUNDING FOR REQUIRED CONSULTS.
- 2004- **MEASURE CC PASSES WITH \$1 MILLION FOR UPDATED HEF PLAN/EIR** PROJECTS.
- 2005 **HEF DECIDES NO JOINT PLAN/EIR. EACH AGENCY GOES IT ALONE** LONE

## CITY FIRE MITIGATION PLANNING

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

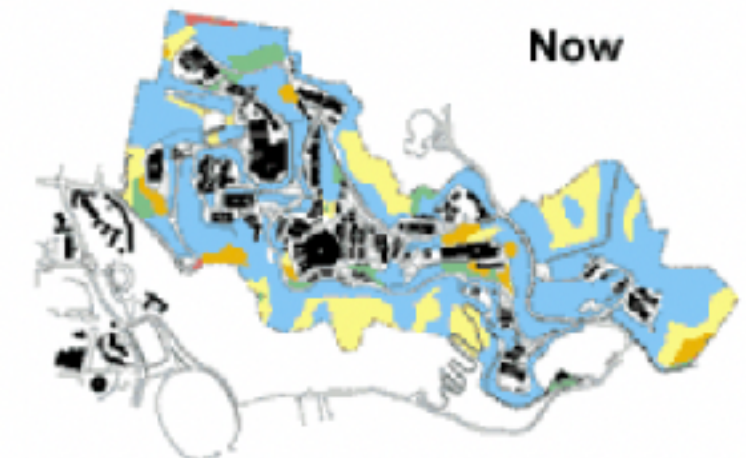
THE EAST BAY HILLS EMERGENCY FORUM HAS CONTINUED TO PROVIDE ACTIVE LEADERSHIP FOR MEMBER AGENCIES FOR THE PAST 27 YEARS.



## THE BERKELEY LAB ADOPTED ITS OWN WILDLAND FIRE REDUCTION PROGRAM IN 2000



**BERKELEY LAB**  
Bringing Science Solutions to the World



THESE [MAPS TELL THE STORY](#) OF THE REDUCTION IN WILDLAND FIRE THREAT AT THE LAB

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.





EBMUD ADOPTED ITS FIRE MANAGEMENT PLAN IN 2000

# Fire Management Plan



October 2000



East Bay Municipal Utility District

# East Bay Watershed Master Plan



FINAL PUBLIC REVIEW DRAFT

ORIGINAL PLAN -2000  
UPDATED PLAN- 2018

2017





**2005- USING MEASURE CC FUNDING, THE PARK DISTRICT BEGAN WORK ON ITS WILDFIRE HAZARD REDUCTION, RESOURCE MANAGEMENT PLAN, AND EIR FOR HILL REGIONAL PARKS**

PUBLIC REVIEW DRAFT

EAST BAY REGIONAL PARKS DISTRICT  
WILDFIRE HAZARD REDUCTION AND  
RESOURCE MANAGEMENT PLAN  
ENVIRONMENTAL IMPACT REPORT



STATE CLEARINGHOUSE NO. #2008042099

LSA

July 2009

EAST BAY REGIONAL PARK DISTRICT  
DRAFT WILDFIRE HAZARD REDUCTION  
AND RESOURCE MANAGEMENT PLAN



LSA

July 2009

FINAL

EAST BAY REGIONAL PARKS DISTRICT  
WILDFIRE HAZARD REDUCTION AND  
RESOURCE MANAGEMENT PLAN  
ENVIRONMENTAL IMPACT REPORT  
RESPONSE TO COMMENTS DOCUMENT



STATE CLEARINGHOUSE NO. #2008042099

LSA

March 2010

**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



2014

CWPP

Community Wildfire Protection Plan  
Contra Costa County, California

Prepared by  
Diablo Fire Safe Council

Some photos provided by: Lucas Frost, www.frost31.com



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



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 (HFRA). 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

Draft

## Hazardous Fire Risk Reduction Environmental Impact Statement

East Bay Hills, California

*April 2013*



Federal Emergency  
Department of Home  
500 C Street, SW  
Washington, DC 204

## Hazardous Fire Risk Reduction Record of Decision

East Bay Hills, California

*February 2015*



Federal Emergency Management Agency  
Department of Homeland Security  
500 C Street, SW  
Washington, DC 20472



# OAKLAND AND BERKELEY AND OTHER AGENCIES PREPARED LOCAL HAZARD MITIGATION PLANS

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

2016

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



2014

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:

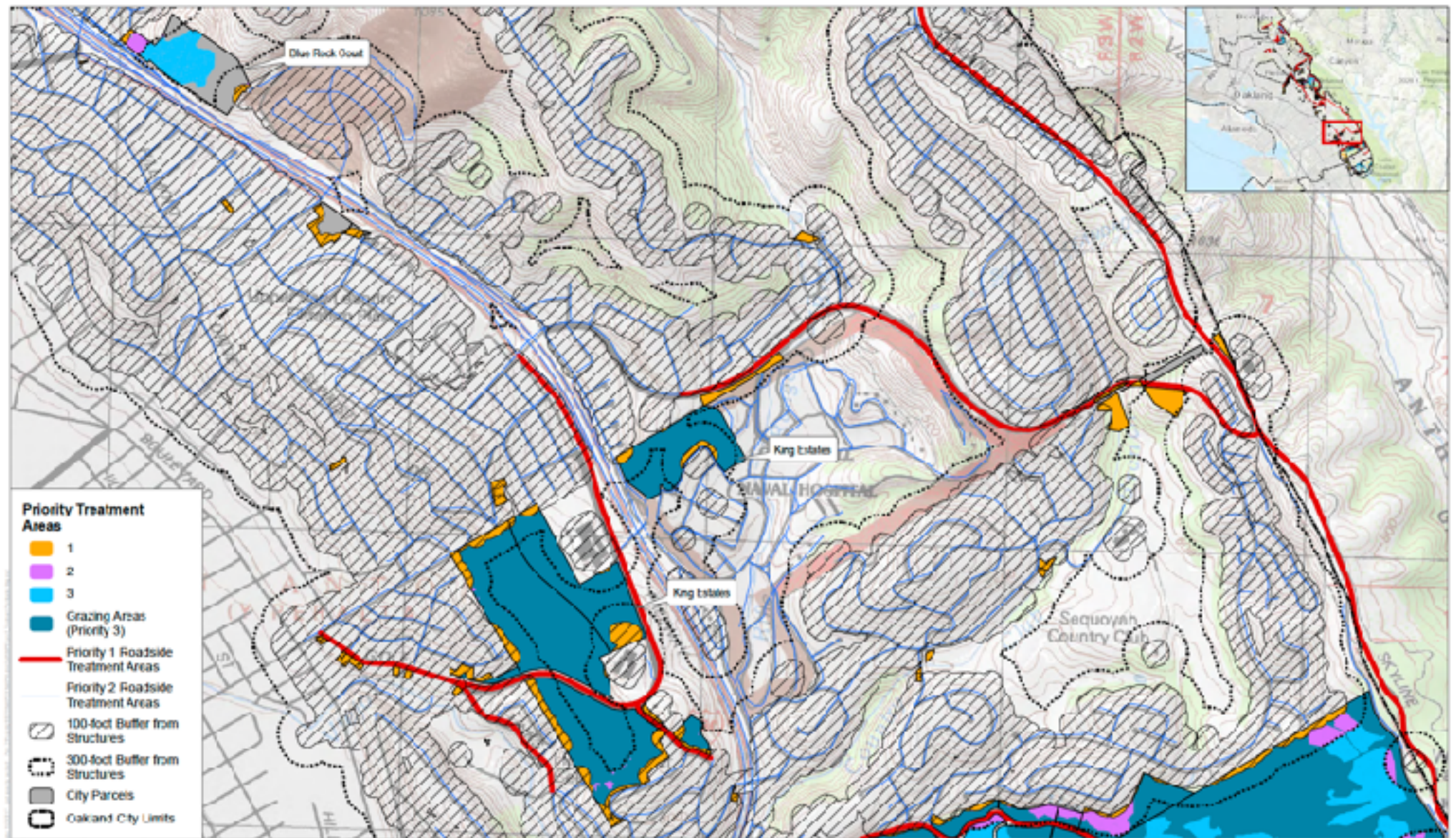
**City of Oakland**  
**Oakland Fire Department**  
250 Frank H. Ogawa Plaza, Suite 33  
Oakland, California 94612  
Contact: Angela Robinson Pflan

Prepared by:

**DUDEK**  
853 Lincoln Way, Suite 208  
Auburn, California 95603  
Contact: Scott Eckardt, RPF

**MAY 2018**

**600 PAGES**



SOURCE: USGS 2017, DSR 2017, Oakland 2016, Dudek 2017

**DUDEK**

FIGURE 1.8

Treatment Prioritization Map

Draft Vegetation Management Plan City of Oakland, California



**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)**

**100 YEARS OF FIRE EXCLUSION WAS WRONG**

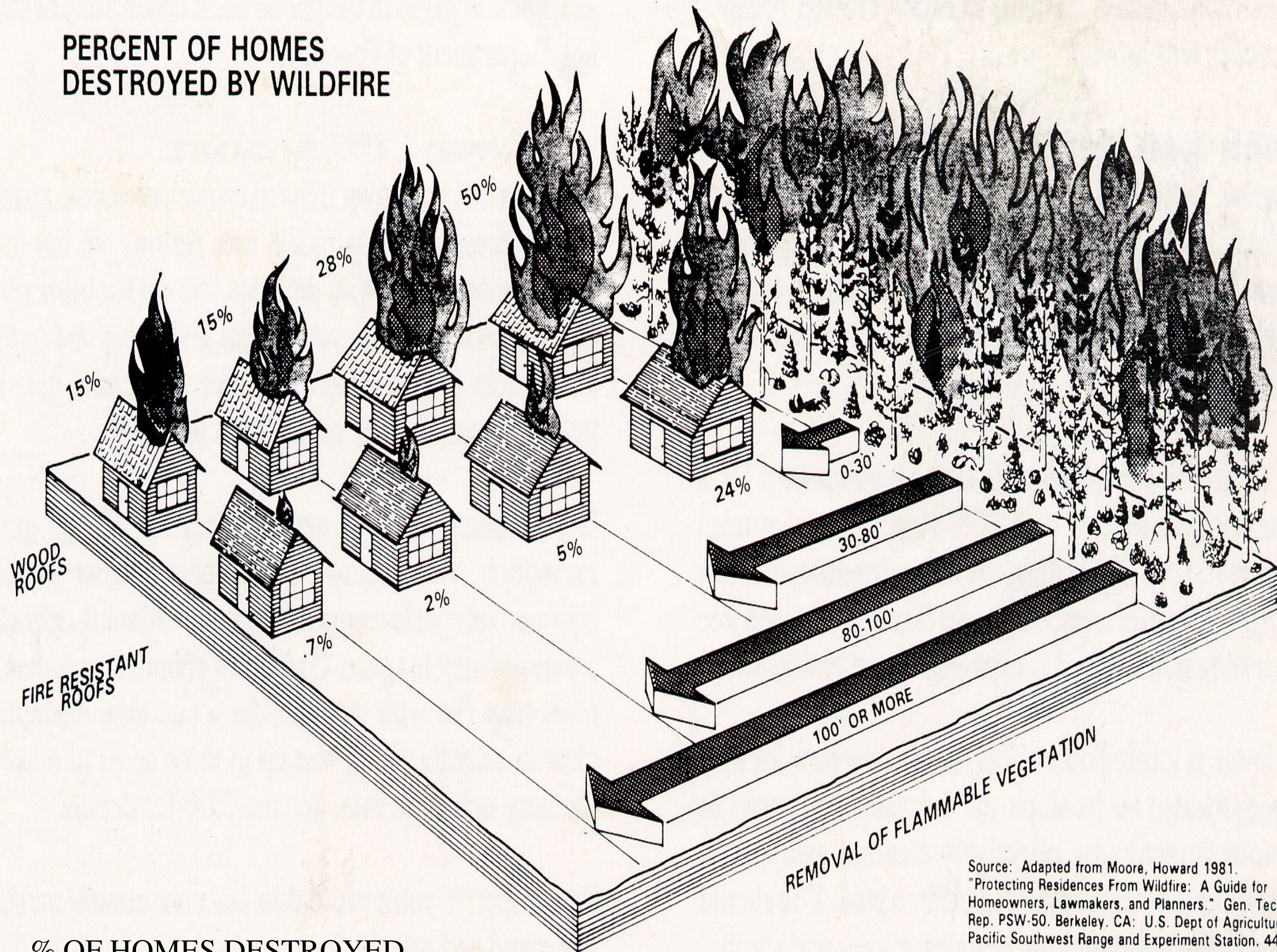


**THINNING AND PRESCRIBED FIRE IS RIGHT**

**THIS MAY ALSO BE TRUE TODAY FOR DENSELY DEVELOPED WUI AREAS**



# PERCENT OF HOMES DESTROYED BY WILDFIRE

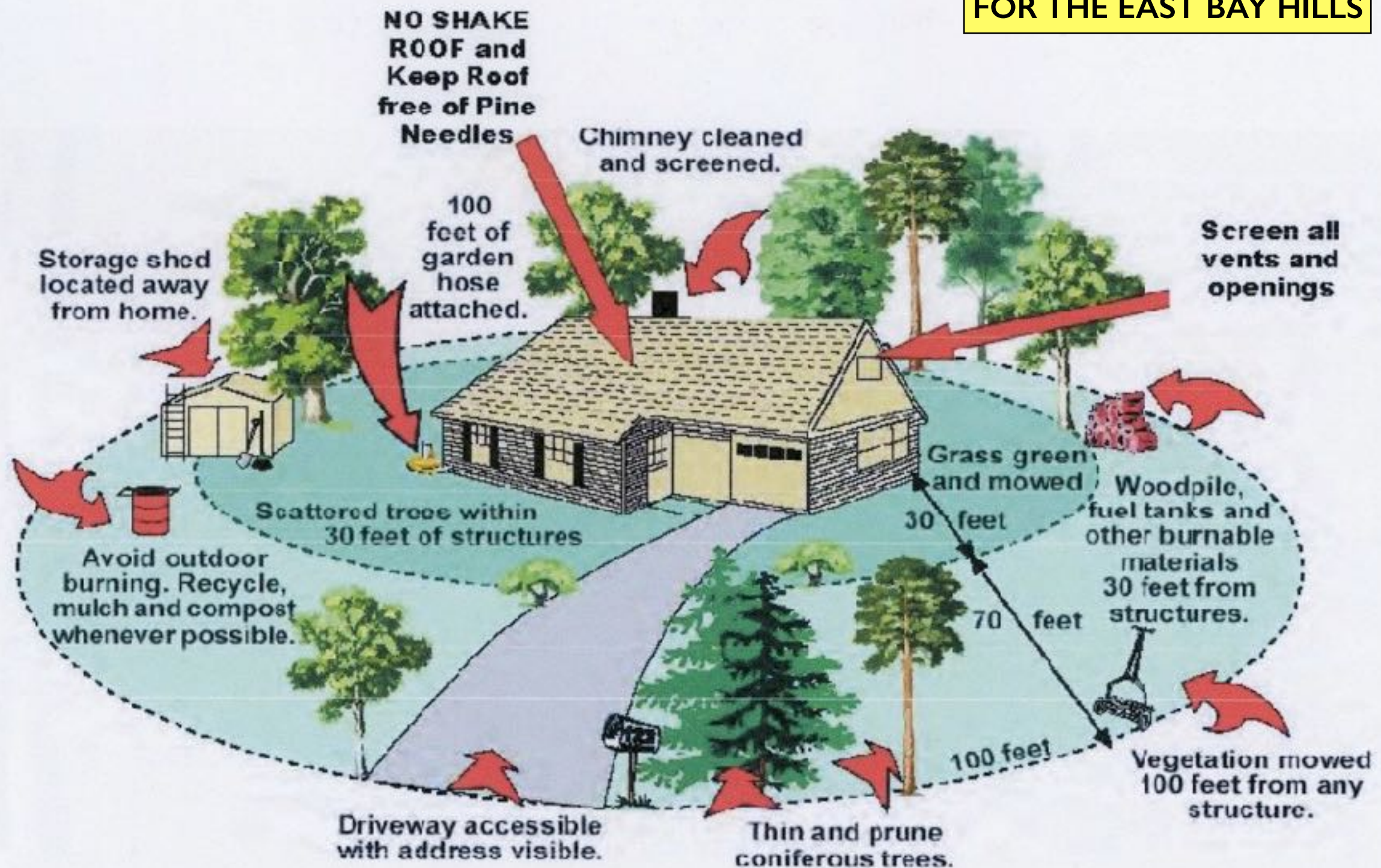


Source: Adapted from Moore, Howard 1981.  
 "Protecting Residences From Wildfire: A Guide for  
 Homeowners, Lawmakers, and Planners." Gen. Tech.  
 Rep. PSW-50. Berkeley, CA: U.S. Dept of Agriculture,  
 Pacific Southwest Range and Experiment Station. 44pp

EARLY SCIENCE FOR PROTECTING HOMES (AFTER 1990 PAINT FIRE)



**NOT VERY USEFUL  
FOR THE EAST BAY HILLS**



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

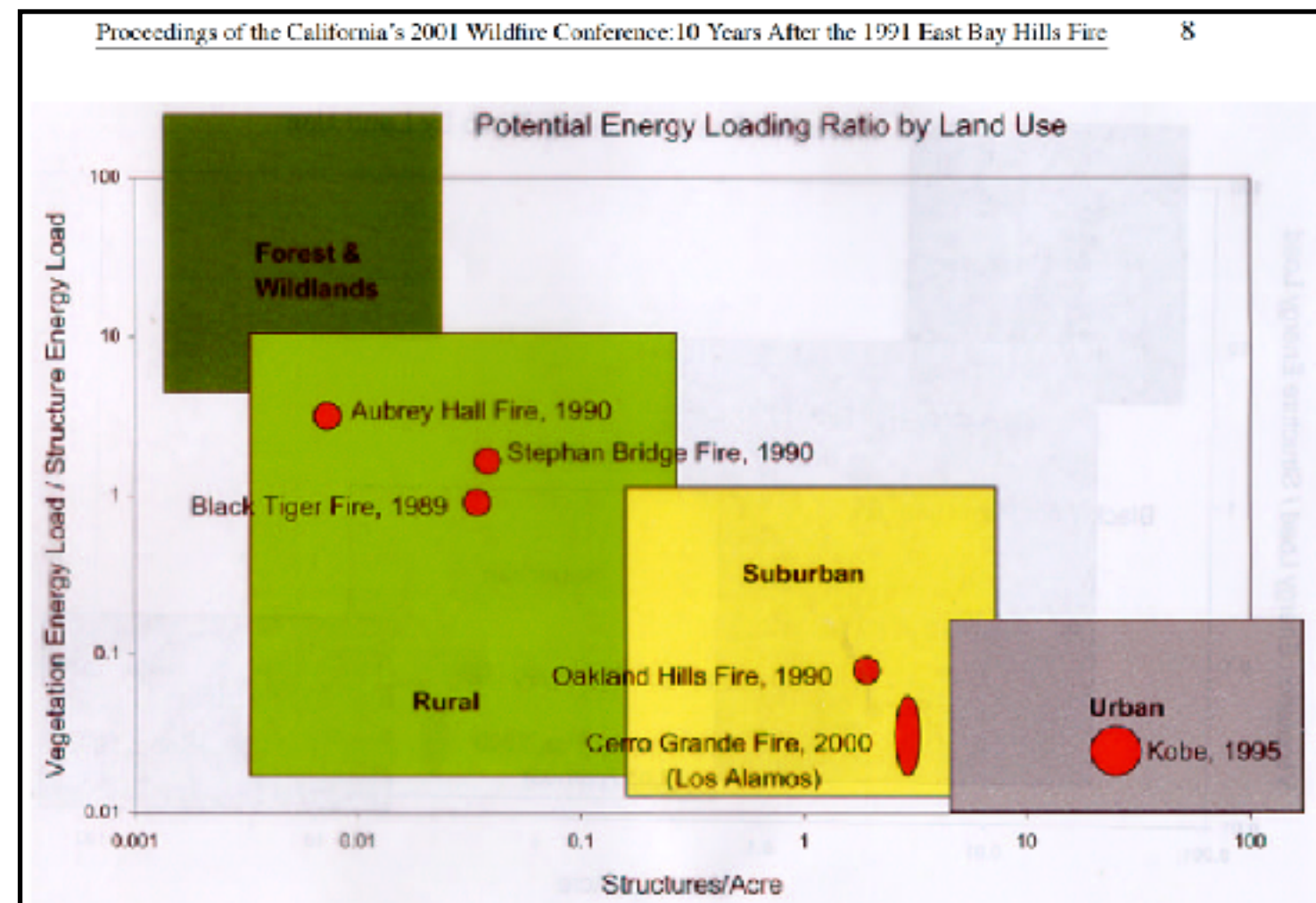
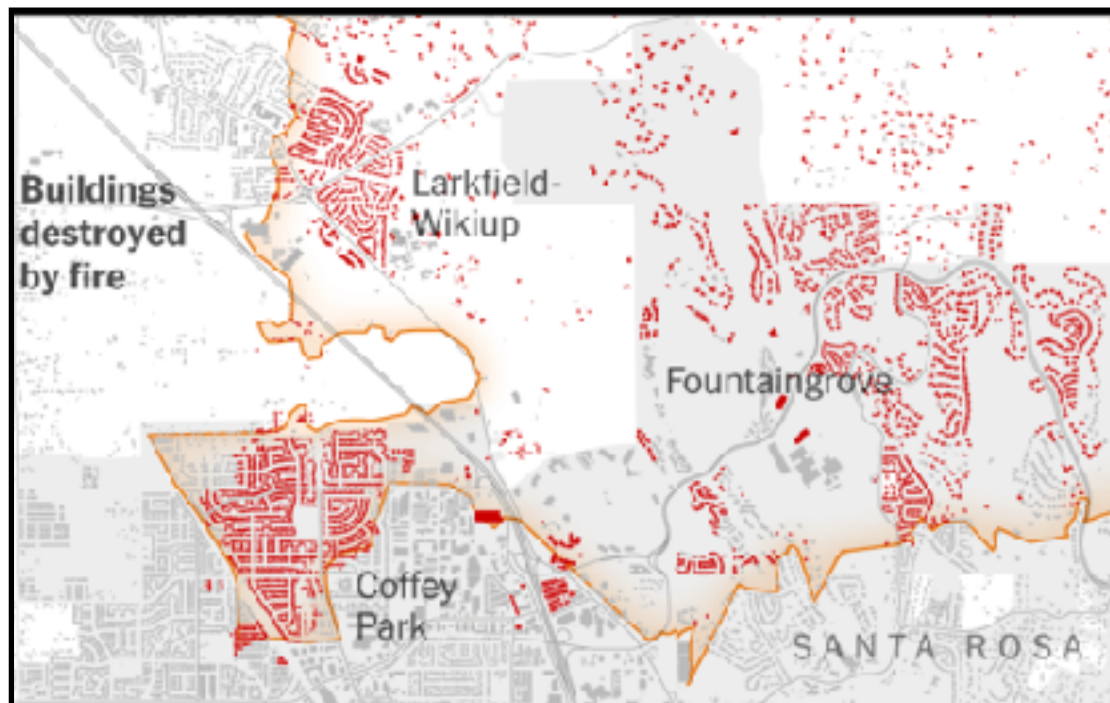


## AND, WE KNOW THAT AN UNPREPARED HOME CAN REPRESENT 90% OF THE FUEL ON A LOT

Potential energy loading for 13 standard fuel models (from Pyne et al. 1996), and fuel energy for a typical house (from Trelles and Pagni 1997) Assuming a house on 1/4 acre plot					
Standard Fuel Models		1/4 acre of vegetation fuel expressed as Btu's	Fuel in a typical house expressed as Btu's	Vegetation fuel by %	House fuel by %
1	Short grass	3 million Btu	151 million Btu	2%	98%
2	Timber (grass understory)	8 million Btu	151 million Btu	5%	95%
3	Tall grass	11 million Btu	151 million Btu	7%	93%
4	Chaparral	19 million Btu	151 million Btu	11%	89%
5	Brush	4 million Btu	151 million Btu	3%	97%
6	Dormant brush/ slash	9 million Btu	151 million Btu	6%	94%
7	Southern rough	8 million Btu	151 million Btu	5%	95%
8	Closed timber litter	10 million Btu	151 million Btu	6%	94%
9	Hardwood litter	12 million Btu	151 million Btu	7%	93%
10	Timber (litter understory)	20 million Btu	151 million Btu	12%	88%

**BURNING EMBERS WILL QUICKLY  
SPREAD FIRE INTO DEVELOPED AREAS**

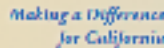
**WHERE HOME HARDENING WILL HELP  
RESIST THE INITIAL IGNITION AND  
REDUCE HOME TO HOME IGNITIONS**






# STANDARDS FOR HOMES THAT CAN RESIST FLAMES AND BURNING EMBERS ARE AVAILABLE FOR NEW CONSTRUCTION, REMODELLING, AND FOR RETROFITTING OLDER HOMES

BEST CURRENT INFORMATION TODAY



University of California  
Agriculture and Natural Resources

<https://anrcatalog.ucdavis.edu>



UC  
PEER  
REVIEWED

Publication 8393 | May 2010

## Home Survival in Wildfire-Prone Areas: Building Materials and Design Considerations

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

### Introduction

Embers are the most important cause of home ignition. Recent research indicates that two out of every three homes destroyed during the 2007 Witch Creek fire in San Diego County were ignited either directly or indirectly by wind-dispersed, wildfire-generated, burning or glowing embers (Maranghides and Mell 2009) and not from the actual flames of the fire. These 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 designs that will help the home resist the wildfire; and 2) the home must have adequate defensible space, based on the wise selection, placement, and maintenance of near-home vegetation.

There is a direct link between home survival, the vegetation management required in developing 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 siting 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 house. 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

Wildfires 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 spotting (in which embers are blown ahead of the main fire, starting other fires). Should these embers land on or near your house, they could just as

## BE READY- PREPARE YOUR HOME



### ROOFS

Roofs are the most vulnerable surface where embers land because they can lodge and start a fire. Roof valleys, open ends of barrel tiles and rain gutters are all points of entry.

### EAVES

Embers can gather under open eaves and ignite exposed wood or other combustible material.

### VENTS

Embers can enter the attic or other concealed spaces and ignite combustible materials. Vents in eaves and cornices are particularly vulnerable, as are any unscreened vents.

### WALLS

Combustible siding or other combustible or overlapping materials provide surfaces or crevices for embers to nestle and ignite.

### WINDOWS and DOORS

Embers can enter gaps in doors, including garage doors. Plants or combustible storage near windows can be ignited from embers and generate heat that can break windows and/or melt combustible frames.

### BALCONIES and DECKS

Embers can collect in or on combustible surfaces or the undersides of decks and balconies, ignite the material and enter the home through walls or windows.



**SOME GROUPS ARE LOBBYING FOR HOME HARDENING AND DEFENSIBLE SPACE ONLY !  
NO FUELBREAKS, NO FOREST THINNING, AND NO OPEN SPACE VEGETATION MANAGEMENT**



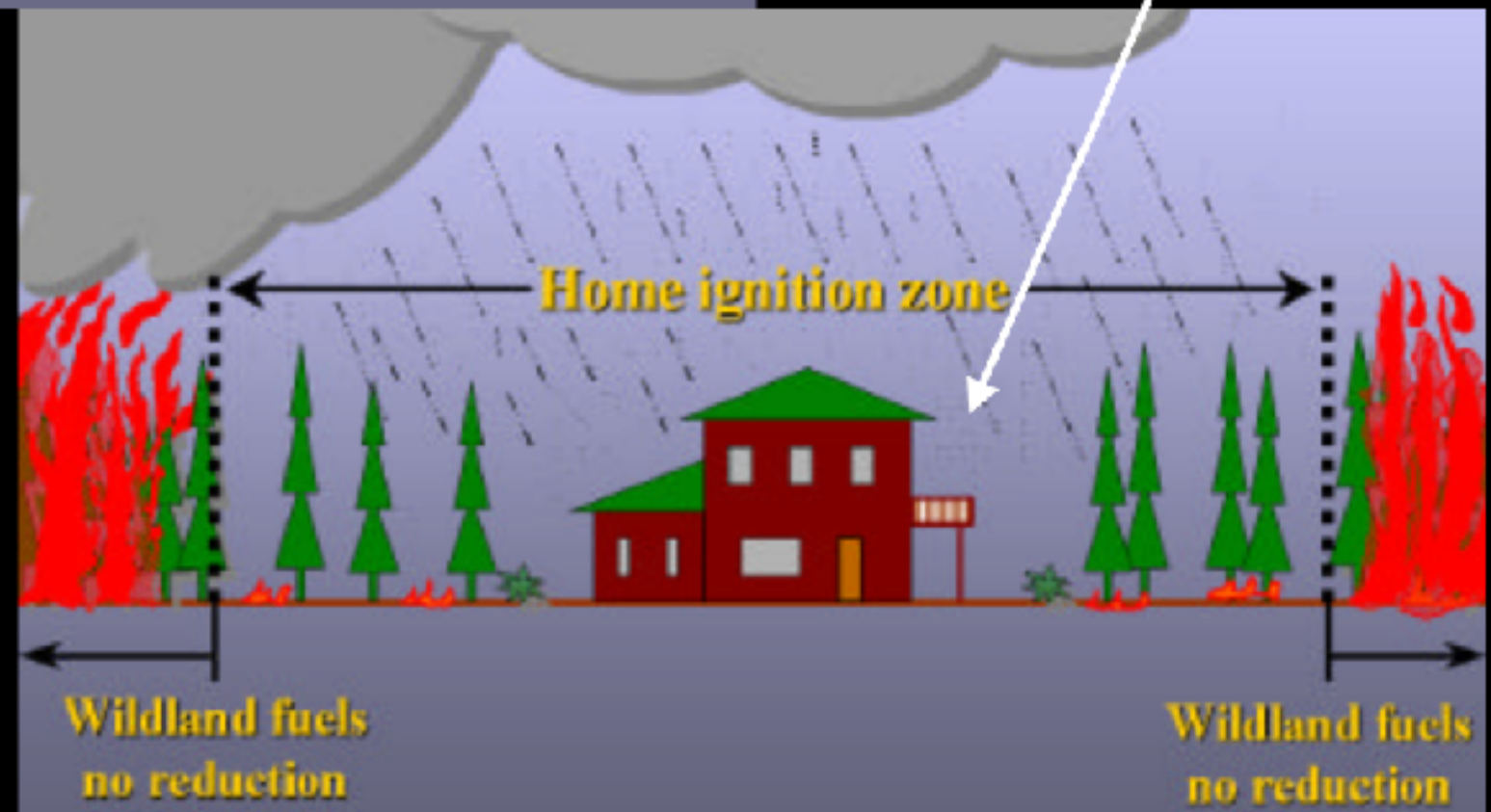
RICHARD HALSEY- CHAPARRAL INSTITUTE, CHAD HANSON- THE JOHN MUIR PROJECT,  
BRIAN NOWICKI- CENTER FOR BIOLOGICAL DIVERSITY, KATHRYN PHILLIPS- SIERRA CLUB CALIFORNIA



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



NO FIRE TRUCK  
NEEDED

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



**IF THEY ARE RIGHT- SHOULD THINNING AND REMOVING TREES IN  
HOME IGNITION ZONES BE REQUIRED WITH LITTLE MANAGEMENT IN OPEN SPACE AREAS ?**

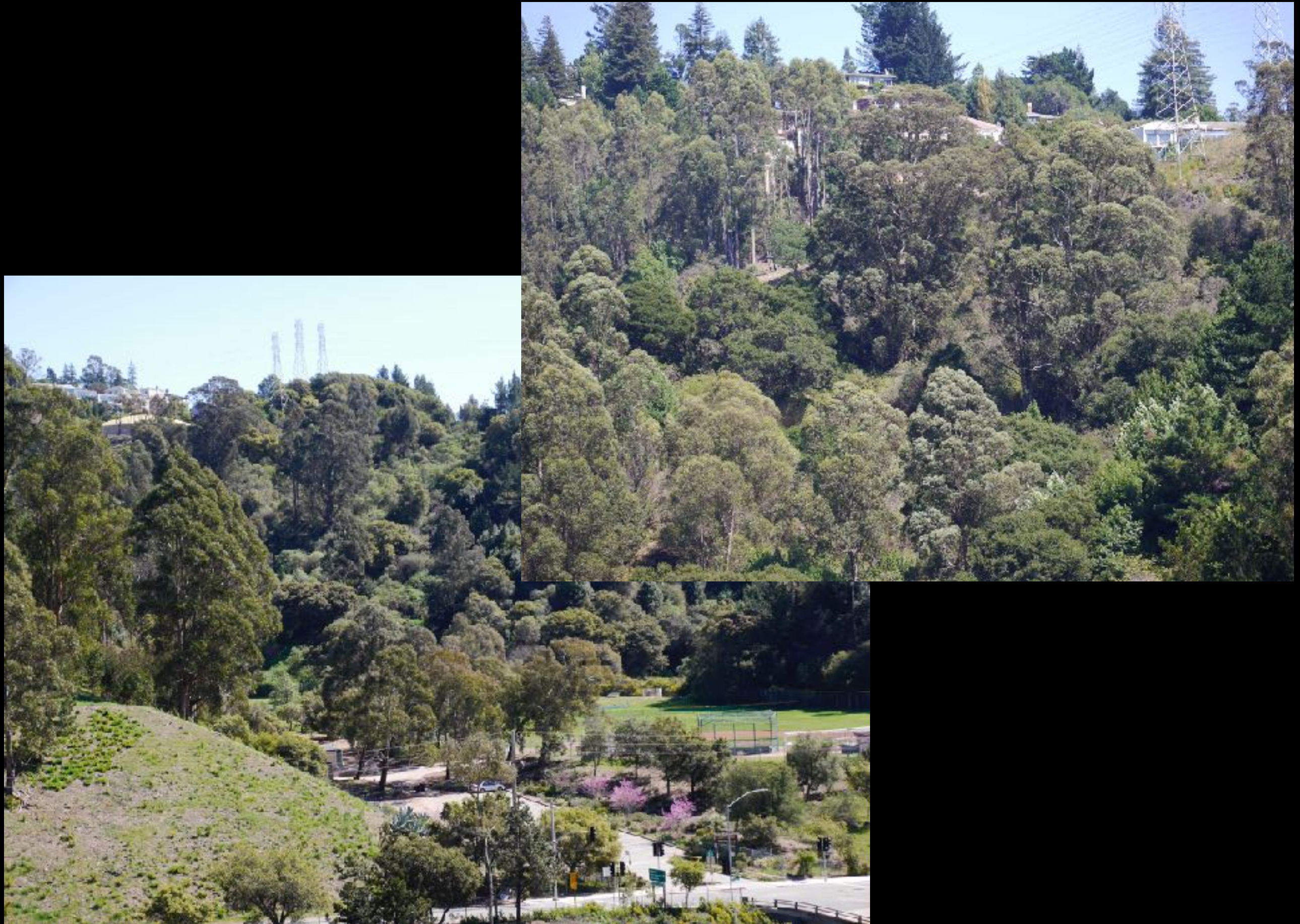


**MANAGING HOME IGNITION ZONES IN THE  
HILLS SOUNDS ATTRACTIVE.**

**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





**OAKLANDS DENSE SUCKER BASHED EUCALYPTUS MIGHT NOT NEED TO BE MANAGED**



**EUCALYPUS 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 ?**



CALIFORNIA  
FIRE SCIENCE  
CONSORTIUM



JOINT  
FIRE SCIENCE  
PROGRAM

## Research Brief for Resource Managers

Release:  
August 2012

Contact:  
Chris Lee

Phone:  
(479) 739-1484

Email:  
calee@unndavis.edu

Northern California Fire Science Delivery Consortium, 5630 South Broadway, Emeryville, CA 94608-6599

## Basic Principles of Forest Fuel Reduction Treatments

Agge, J.K., C.N. Skinner. 2005. Basic principles of forest fuel reduction treatments. *Forest Ecology and Management* 211: 83-96.  
<http://www.forestscience.org/pubs/36591>

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

### Firesafe principles

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

### 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.
- Thinning treatments should be accompanied by post-thinning surface fuel reduction treatments.

- 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.

**GOOD**



**SAF CAN HELP DETERMINE WHAT  
IS SAFE WITH 40 MPH DIABLO WINDS**

**THE CAL TRANS THINNED THIS EUCALYPTUS GROVE IN 2014 AND THE CANOPY CLOSED BY 2019.**

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





**SAF CAN HELP CLARIFY STUMP  
CONTROL OPTIONS**



**COPPICE STUMP TREATED WITH GARLON TO PREVENT SUCKER GROWTH**

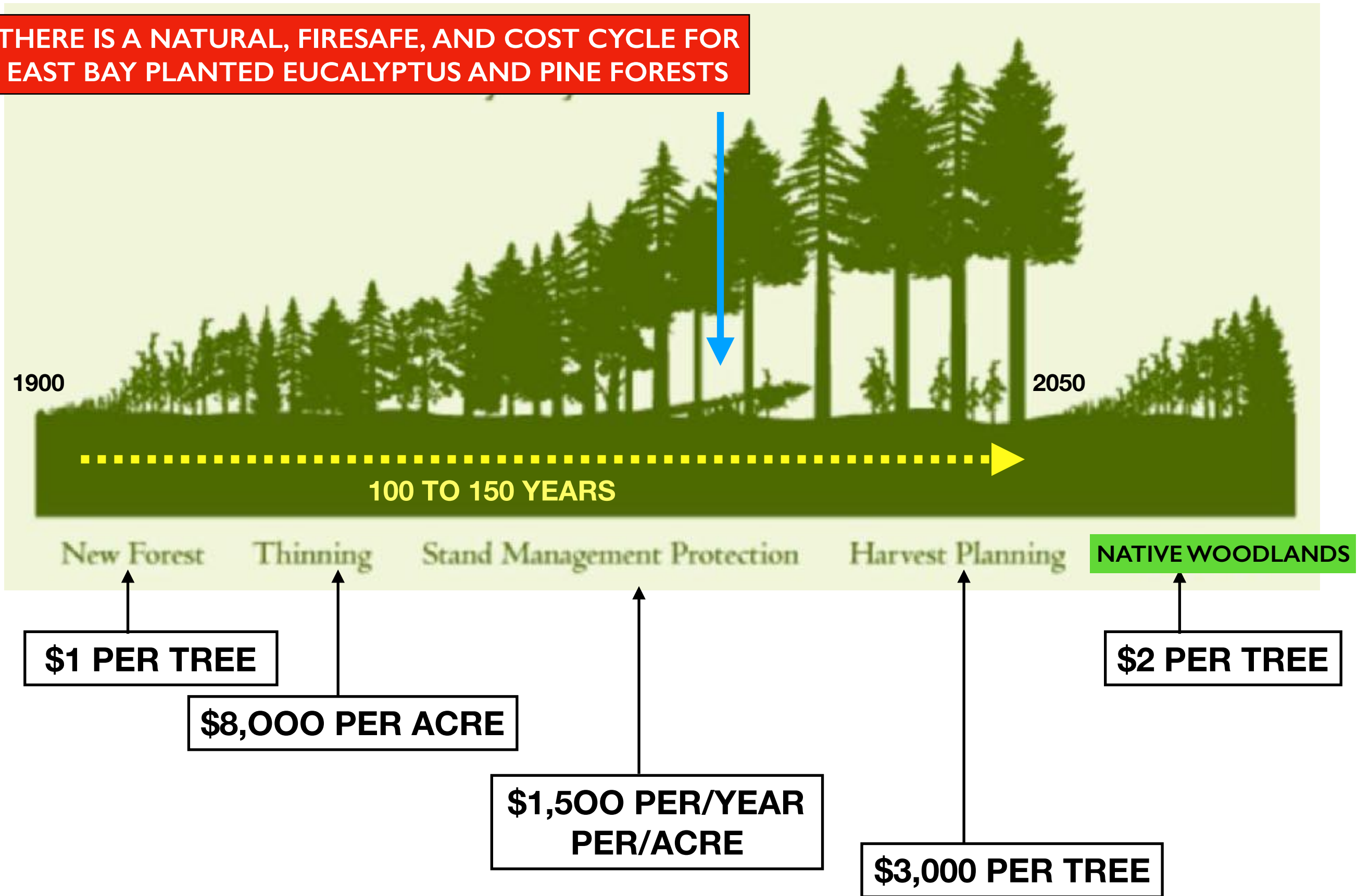




**CHABOT CAMPGROUND THINNED OF ALL STEMS <8" TO SAVE LARGER TREES IN 2012**



THERE IS A NATURAL, FIRESAFE, AND COST CYCLE FOR EAST BAY PLANTED EUCALYPTUS AND PINE FORESTS





PINES REMOVED

WEST SIDE OF CALDECOTT TUNNEL CANYON



NOT VERY FLAMMABLE



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



**EUCALYPTUS REMOVED**

**SIGNPOST #29 SOUTH SIDE OF THE CANYON**



**NOT VERY FLAMMABLE**



**UC- RESTORED CLAREMONT CANYON AREA AT AN AVERAGE COST OF \$4,000 PER ACRE**



**EBMUD GRIZZLY RIDGE FUELBREAK FIRE MITIGATION PROJECT UNDERWAY**



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



**NOT VERY FLAMMABLE**



**CNPS AND EBMUD JOINT SKYLINE GARDENS FUELBREAK PROJECT WITHOUT USE OF ROUNDUP**





**SIBLEY ISLAND RIDGETOP FUELBREAK WITH EUCALYPTUS AND PINE REMOVED**



WHILE WE ARGUED, WE THOUGHT NOTHING COULD TOP THE 1991 OAKLAND TUNNEL FIRE

### The Oakland hills fire:

#### 1991 TUNNEL FIRE- NOW 28 YEARS AGO

**Fire statistics**

Deaths	25
Injuries	150
Houses destroyed	2,843
Apartments destroyed	433
Dwellings destroyed	3,276
Acres burned	1,520
Fire perimeter	5.25 miles
Dollar loss	\$1.537 billion

**Some changes made**

An automated weather station was installed in the Oakland-Berkeley hills, linked to the Department of Forestry, alerting departments to low-humidity and high-temperature conditions.

In interagency drills, local fire departments practice coordinated firefighting in field conditions, training urban firefighters in wildland firefighting techniques.

Properties are inspected and fire codes enforced for clearing combustibles near houses and maintaining fire roads.

Controlled burns have eliminated more than 1,200 acres of fuel.

Communication systems have improved. In 1991, the Oakland Fire Department used a 2-band radio, limiting all emergency communication to 2 channels, which were overloaded during the blaze. Now in place is a 800-MHz "trunked" system, allowing unlimited channels.

Sources: California Office of Emergency Services, Oakland Fire Department, Hills Emergency Forum 1999 Annual Report

Morning wind direction

Orinda

Fire origin

Caldecott Tunnel

Berkeley

24

1 mile

101

50

680

580

1

280






520

#### How quickly the fire spread

On Oct. 19, 1991, a grass fire in the Oakland hills was put out. Hoses were left in place, and the area was checked during the night. The next morning, according to eyewitness accounts, a single ember blew from the ashes into a tree outside the burn area, and the resulting fire was suddenly out of control.

DAVE JOHNSON/STAFF

THREE OF THE MOST DESTRUCTIVE WILDFIRES IN CALIFORNIA HISTORY

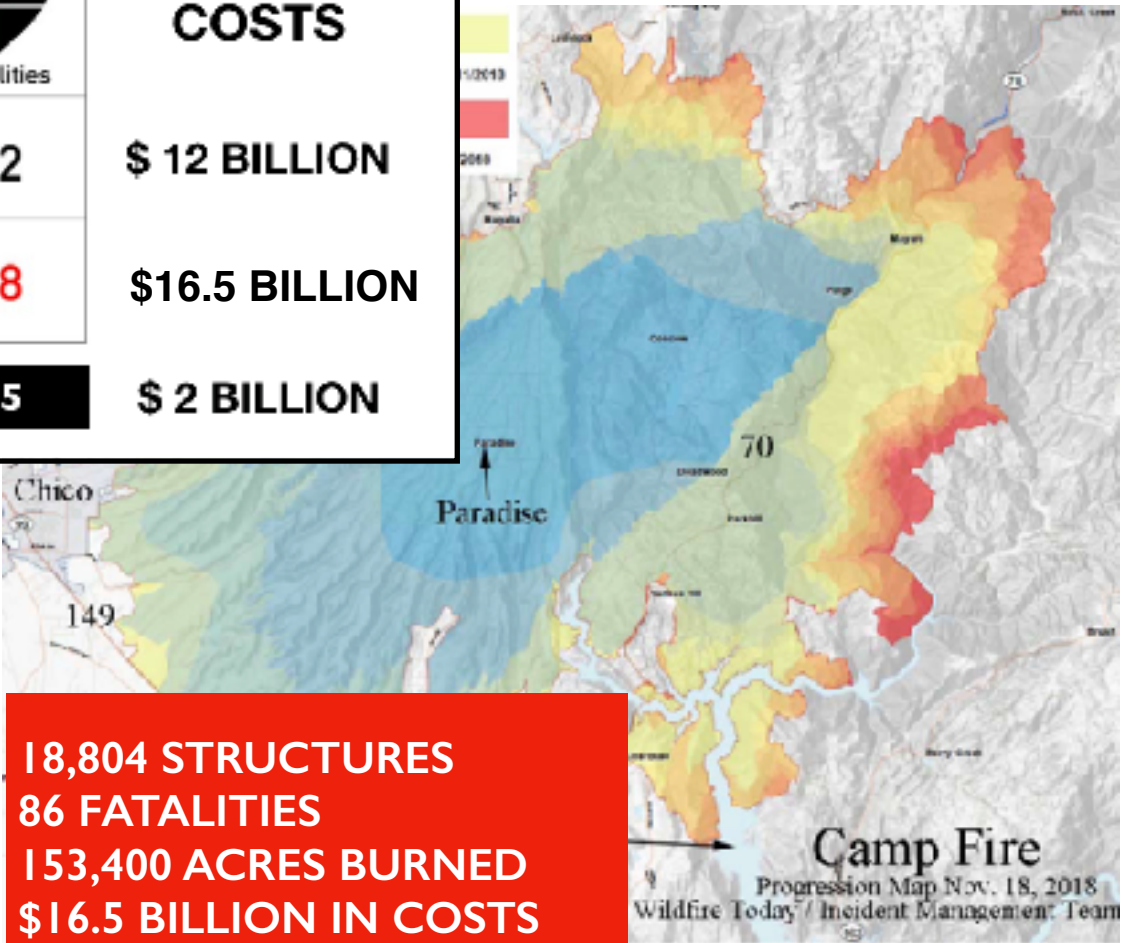
By The Numbers : Tubbs and Camp Fires					
	 Cal OES GOVERNOR'S OFFICE OF EMERGENCY SERVICES	 Days Burned For	 Acres Burned	 Structures Destroyed	 Fatalities
2017	Tubbs Fire	23	36,307	5,636	22
2018	Camp Fire	17	153,336	18,613	88
1991	OAKLAND FIRE I		1,600	3,000	25

**COSTS**

\$ 12 BILLION

\$16.5 BILLION

\$ 2 BILLION



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**

## 14 MAJOR FIRES DURING THE PAST 15 YEARS

RANKS DURING YEARS		CALIFORNIA'S 20 MOST DESTRUCTIVE FIRES						MOST STATE RECORD YEARS FOR DAMAGE		
		Year	Month	Name	County	Acres	Structures			Deaths
14	→	2018	November	Camp	Butte	153,336	18,804	88		
13	→	2017	October	Tubbs	Napa, Solano	36,807	5,643	22	←	1 YEAR
		1991	October	Tunnel	Alameda	1,600	2,900	25	←	27 YEARS
12	→	2003	October	Cedar	San Diego	273,246	2,820	15		
11	→	2015	September	Valley	Lake, Napa, Sonoma	76,067	1,955	4		
10	→	2007	October	Witch	San Diego	197,900	1,650	6		
9	→	2018	November	Woolsey	Venture, Los Angeles	96,949	1,643	3		
8	→	2018	July	Carr	Shasta, Trinity	222,937	1,604	8		
7	→	2017	October	Nuns	Sonoma	54,382	1,355	3		
6	→	2017	December	Thomas	Venture, Santa Barbara	281,893	1,063	1		
5	→	2003	October	Old	San Bernadino	91,281	1,003	6		
		1999	October	Jones	Shasta	10,603	954	1		
4	→	2015	September	Butte	Amador, Calaveras	70,868	921	2		
3	→	2017	October	Atlas	Napa, Solano	51,625	783	6		
		1990	June	Paint	Santa Barbara	4,900	641	1	←	1 YEAR
		1992	August	Fountain	Shasta	25,884	636	0		
2	→	2008	November	Sayre	Los Angeles	11,262	604	0		
		1923	September	Berkeley	Alameda	3,200	584	0	←	67 YEARS
		2007	October	Harris	San Diego	90,440	548	8		
1	→	2017	October	Redwood Valley Complex	Mendocino	36,623	546	9		



## WE KNOW THERE WILL BE AN INCREASING FIRE PROBLEM

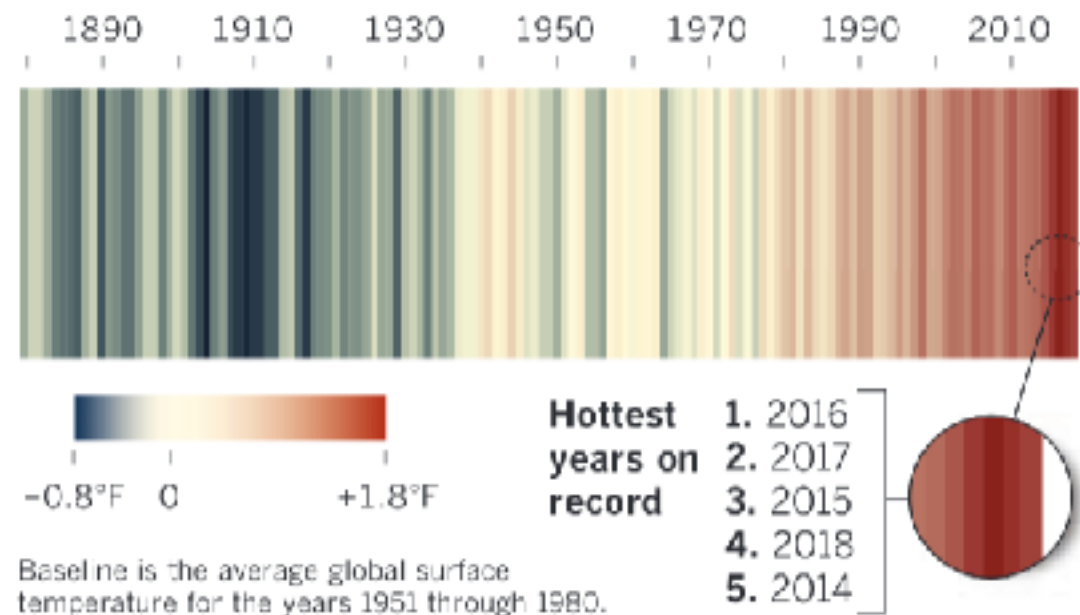
**MORE PEOPLE + HEAT + WILDFIRE + NO STRATEGY = MORE HOMES LOST**

### JON KEELY, UCLA FIRE ECOLOGIST

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.

### Global temperatures ramp up

Average global surface temperature by year



Source: NASA

Los Angeles Times

### THE NEW REALITY





# 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

1971- MISSION VALLEY FIRE- 6 FBF/Hr.  
1991- OAKLAND TUNNEL FIRE- 11 FBF/Hr.  
2017- TUBBS FIRE- 60 FBF/Hr.  
2018- CAMP FIRE- 3 FBF/Sec.



FBF/10 Sec.

**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.**



**REMEMBER THE SIX "P's"**  
**KEEP THESE SIX "P's" READY IN CASE IMMEDIATE EVACUATION IS REQUIRED:**

- People and pets
- Papers, phone numbers, & important documents
- Prescriptions, vitamins, and eyeglasses
- Pictures and irreplaceable memorabilia
- Personal computer hard drive and disks
- "Plastic" (credit cards, ATM cards) and cash



**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

#### I. Fire Code Details

There are two key elements to the WUI fire code: (1) defensible space clearance that must be upkept continuously, and (2) building standards for new construction. In both cases the minimum standards outlined in the state code only require these codes to be enforced in SRA and Very High Fire Hazard Severity Zones in the LRA. Local jurisdictions can increase the extent of the standards if they choose. The suite of codes are well outlined in the California Fire Code Chapter 49. The chapter outlines refers readers to other codes. A summary of Chapter 49 and it's referenced codes is described in this appendix, and includes links to the full code language.

**California Fire Code Chapter 49 Requirements for Wildland-Urban Interface Fire Areas.**

*Adopted frequently. Current code last adopted in 2016.*

The code defines state responsibilities, maps, and plans, and calls out sections of different codes that must be met. The code calls out two key sections:

1. Section 4905 Wildfire Protection Building Construction
  - a. Refers readers to comply with three specific elements of the California Building Standards Code. The Code applies to State Responsibility Areas, and in Local Responsibility Areas where "substantial evidence in the record [shows] that the requirements of this section are necessary for effective fire protection."
    - i. *California Building Code, Chapter 7A.*
    - ii. *California Residential Code, Section R327.*
    - iii. *California Referenced Standards Code, Chapter 12-7A.*
2. Section 4906 Hazardous Vegetation and Fuel Management
  - a. Mandates that all Fire Hazard Severity Zones (Moderate, High, and Very High) in the SRA, and Very High Severity Zones in the LRA are required to comply with the following code requirements.
    - i. *Public Resources Code, Section 4291*
    - ii. *California Code of Regulations, Title 14, Division 1.5, Chapter 7, Subchapter 3, Section 1289.*
    - iii. *California Government Code, Section 51182*
    - iv. *California Code of Regulations, Title 19, Division 1, Chapter 7, Subchapter 1, Section 3.07.*
    - v. *For SRA only*
      1. *Public Resources Code 4290*
      2. *California Code of Regulations, Title 14, Division 1.5, Chapter 7, Subchapter 2, Section 1270*
    - vi. *For LRA only*
      1. *Government Code 51175 - 51189*

**California Building Code 7A**

*Applies to properties permitted after December 1, 2005.*

Applies to building materials, systems, and/or assemblies used in the exterior design and construction of new buildings located within a Wildland-Urban Interface Fire Area – defined as all SRA lands, and Very



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

BUT NO CODES

I

### Strategy Types to Reduce Vulnerability

**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.

**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.

2

**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.

3

**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.

**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.

TO PROTECT  
COMMUNITIES



## **I BELIEVE THERE ARE AT LEAST 11 SMART WUI VEGETATION MANAGEMENT OBJECTIVES**

**TO PROVIDE FOR SAFE  
EVACUATION ROUTES**

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

**TO SAVE PEOPLE AND HOMES**

**TO PROTECT VALUES AT RISK**

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

**TO REDUCE FIRE HEAT AND  
EMBER SPREAD NEAR COMMUNITIES**

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

**TO MANAGE OR REMOVE  
HIGH-FIRE RISK FLAMMABLE INVASIVE'S**

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

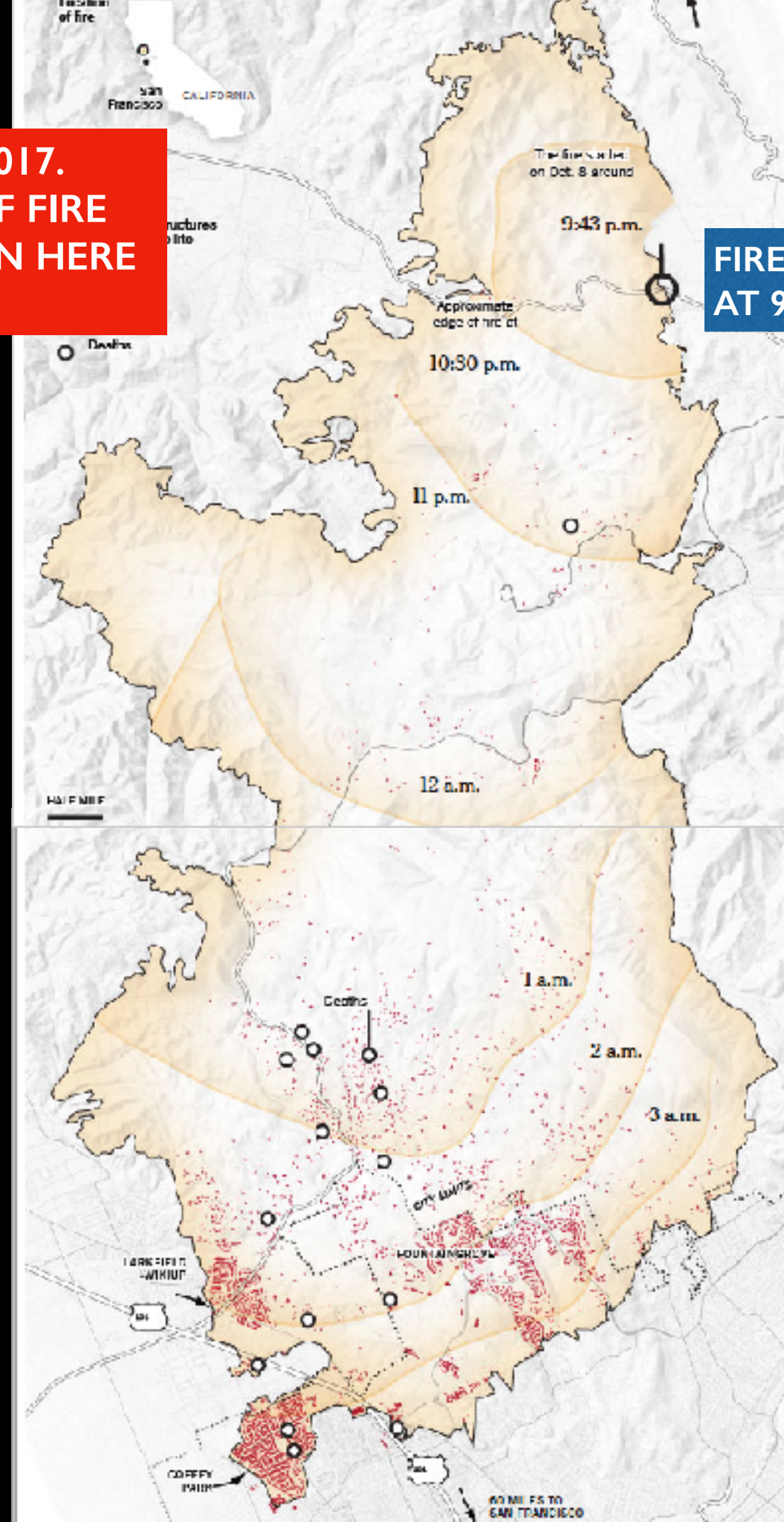
**TO ASSIST FEDERAL AND STATE LISTED SPECIES  
SURVIVE WILDFIRE**

**TO COMPLY WITH STATE ADOPTED WUI CODES,  
AND TO SATISFY CEQA AND EIS MITIGATION REQUIREMENTS**

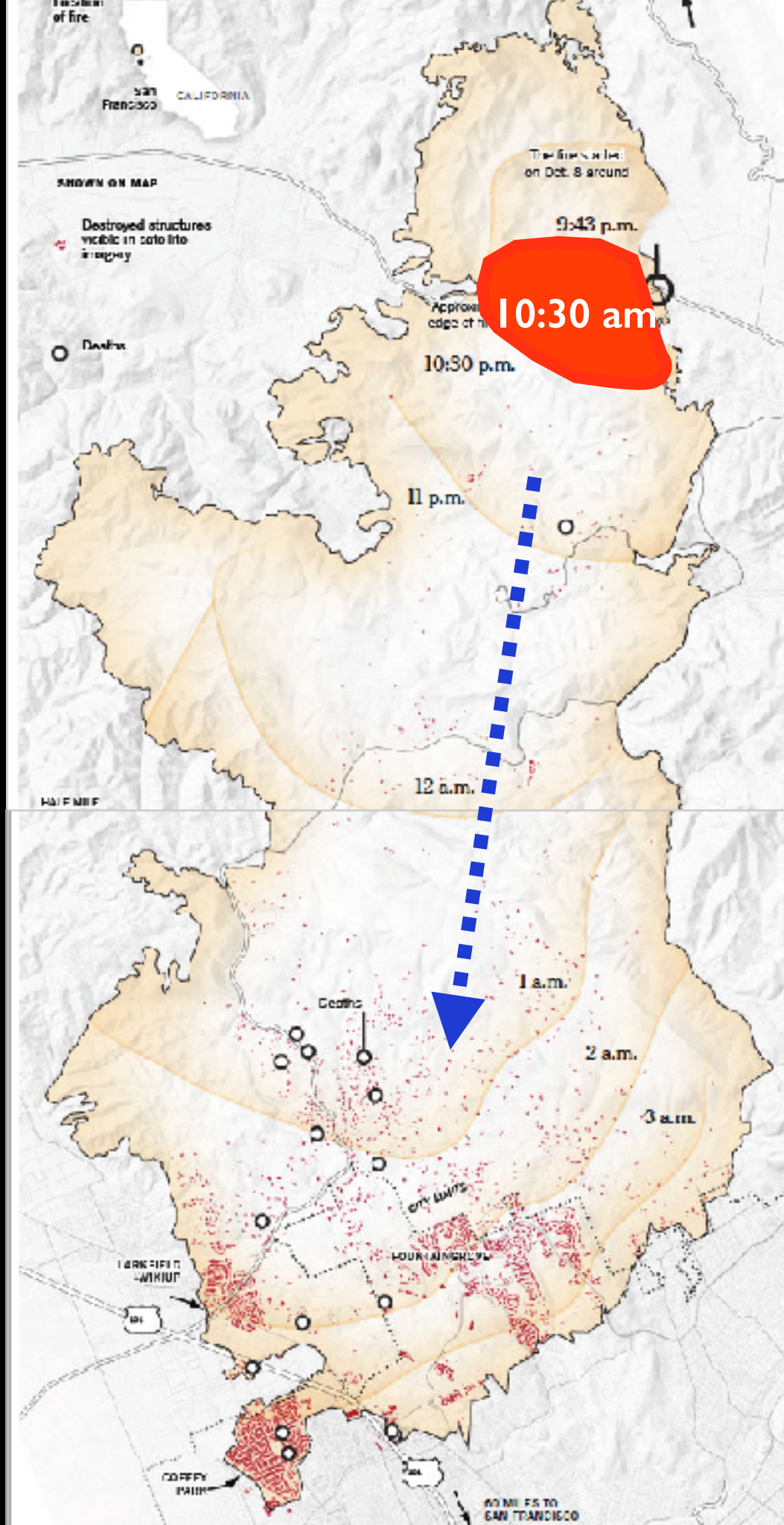


LIKE THE TUBBS FIRE OF 2017.  
COULD A SIMILAR TYPE OF FIRE  
OR SIEGE OF FIRES HAPPEN HERE  
IN THE EAST BAY ?

FIRE STARTS HERE  
AT 9:43 PM ON OCTOBER 8



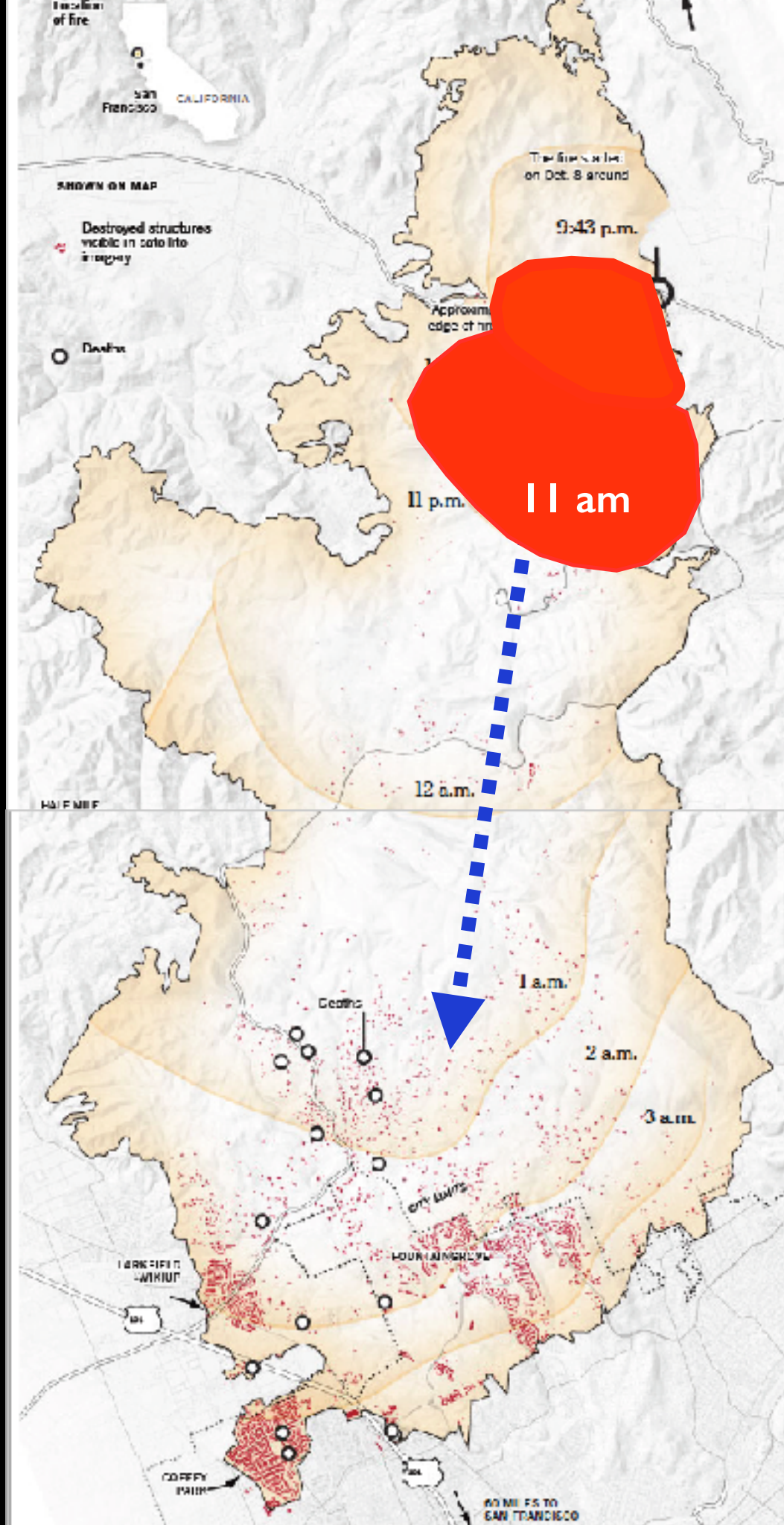




DIABLO WINDS 30 mph

DIABLO WINDS 60 mph

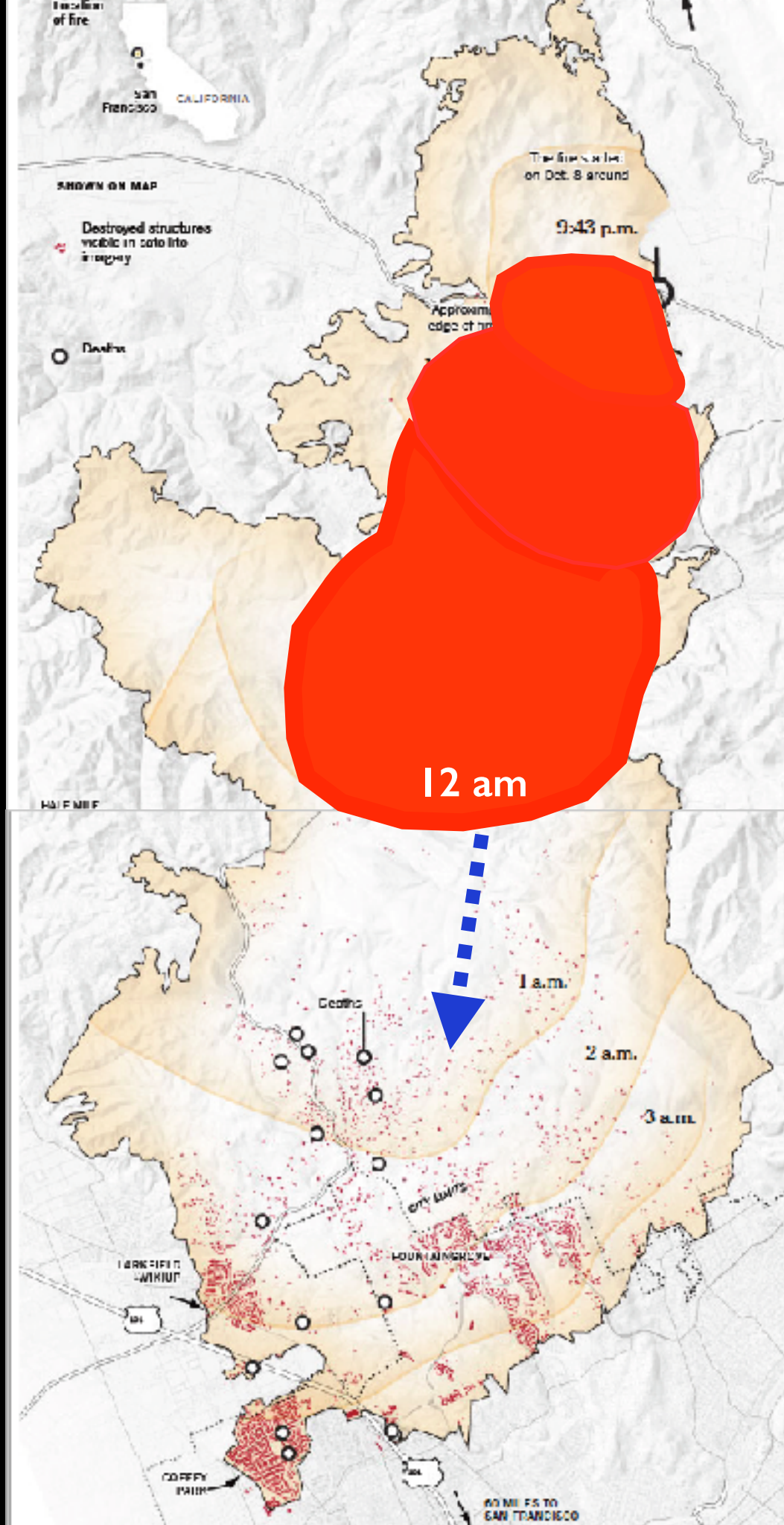




DIABLO WINDS 30 mph

DIABLO WINDS 60 mph

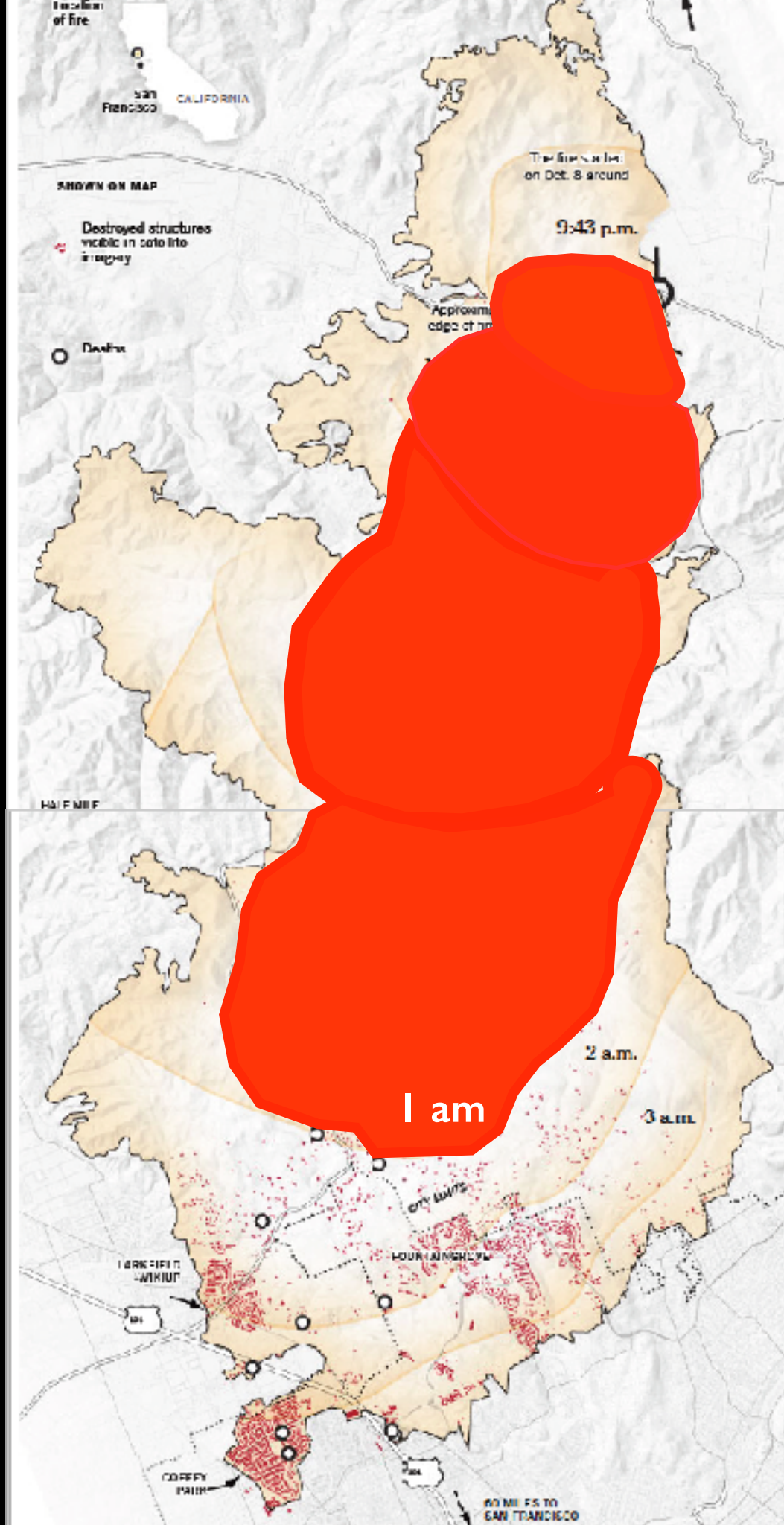




DIABLO WINDS 30 mph

DIABLO WINDS 60 mph

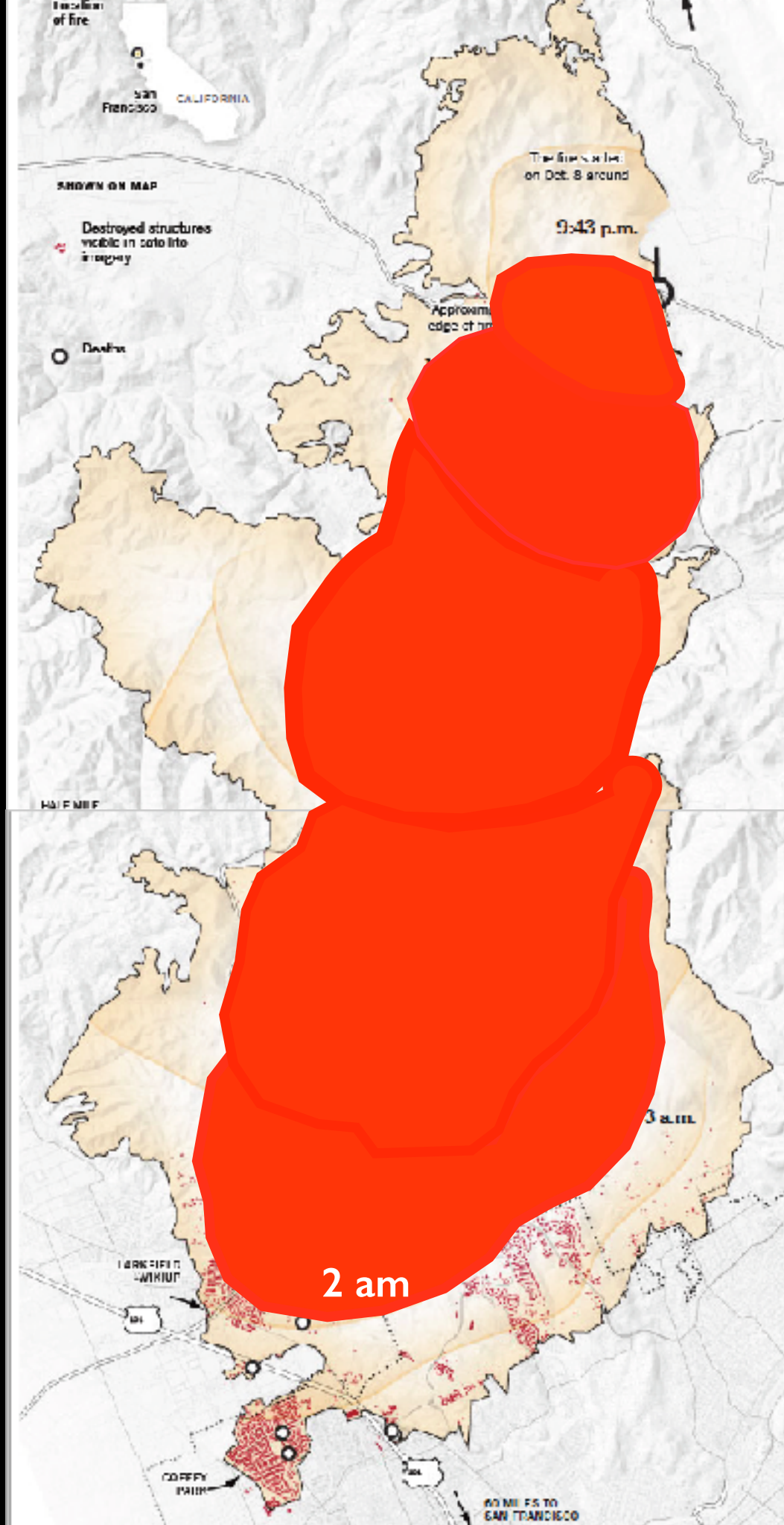




DIABLO WINDS 30 mph

DIABLO WINDS 60 mph

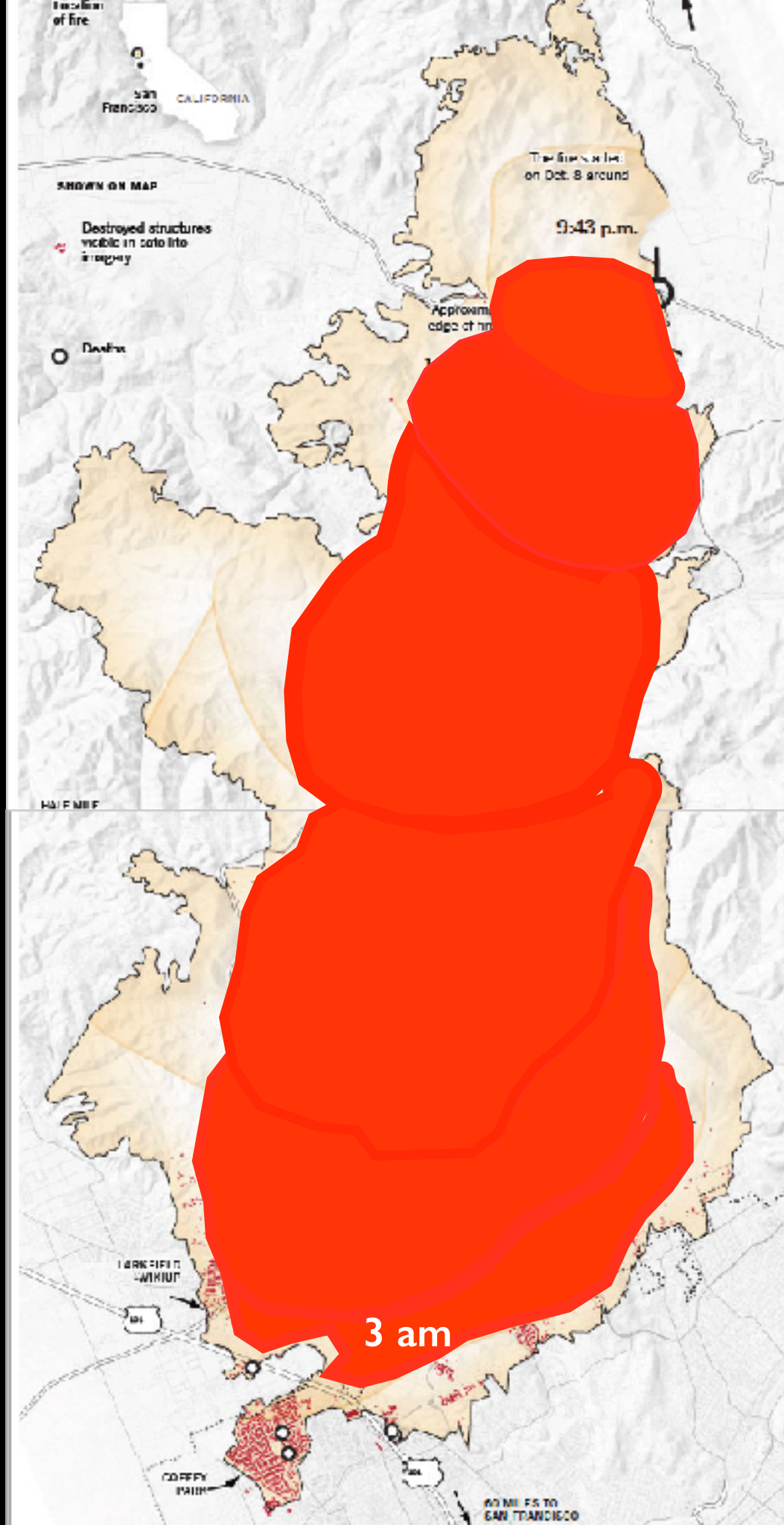




DIABLO WINDS 30 mph

DIABLO WINDS 60 mph





DIABLO WINDS 30 mph

DIABLO WINDS 60 mph

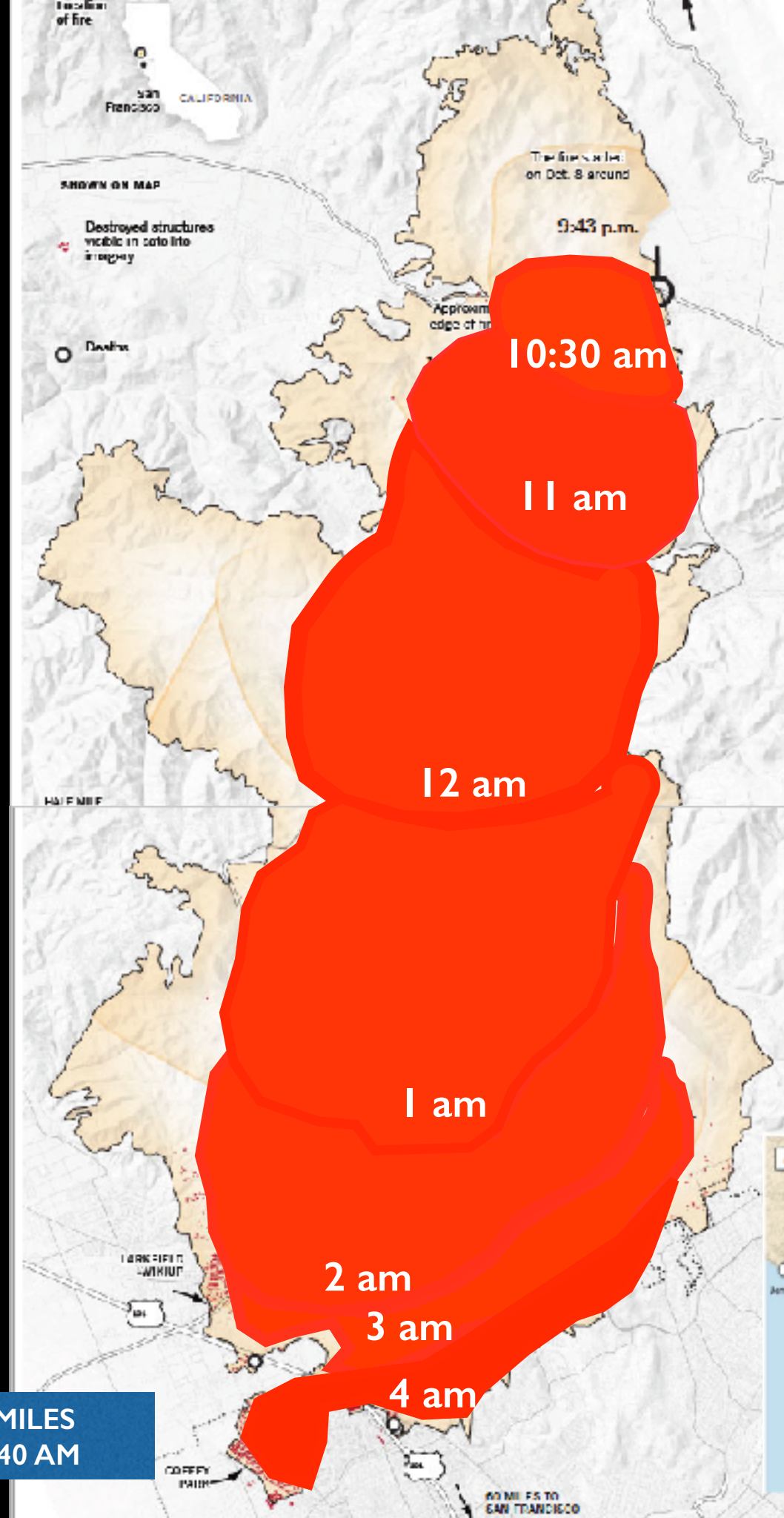






**3,837 HOMES BURNED**  
**73 BUSINESSES BURNED**  
**43 FATALITIES**  
**12,000 EVACUATED**  
**36,800 ACRES BURNED**

**FIRE RUNS 12 MILES  
TO HERE AT 4:40 AM**



**DIABLO WINDS 30 mph**

**DIABLO WINDS 60 mph**

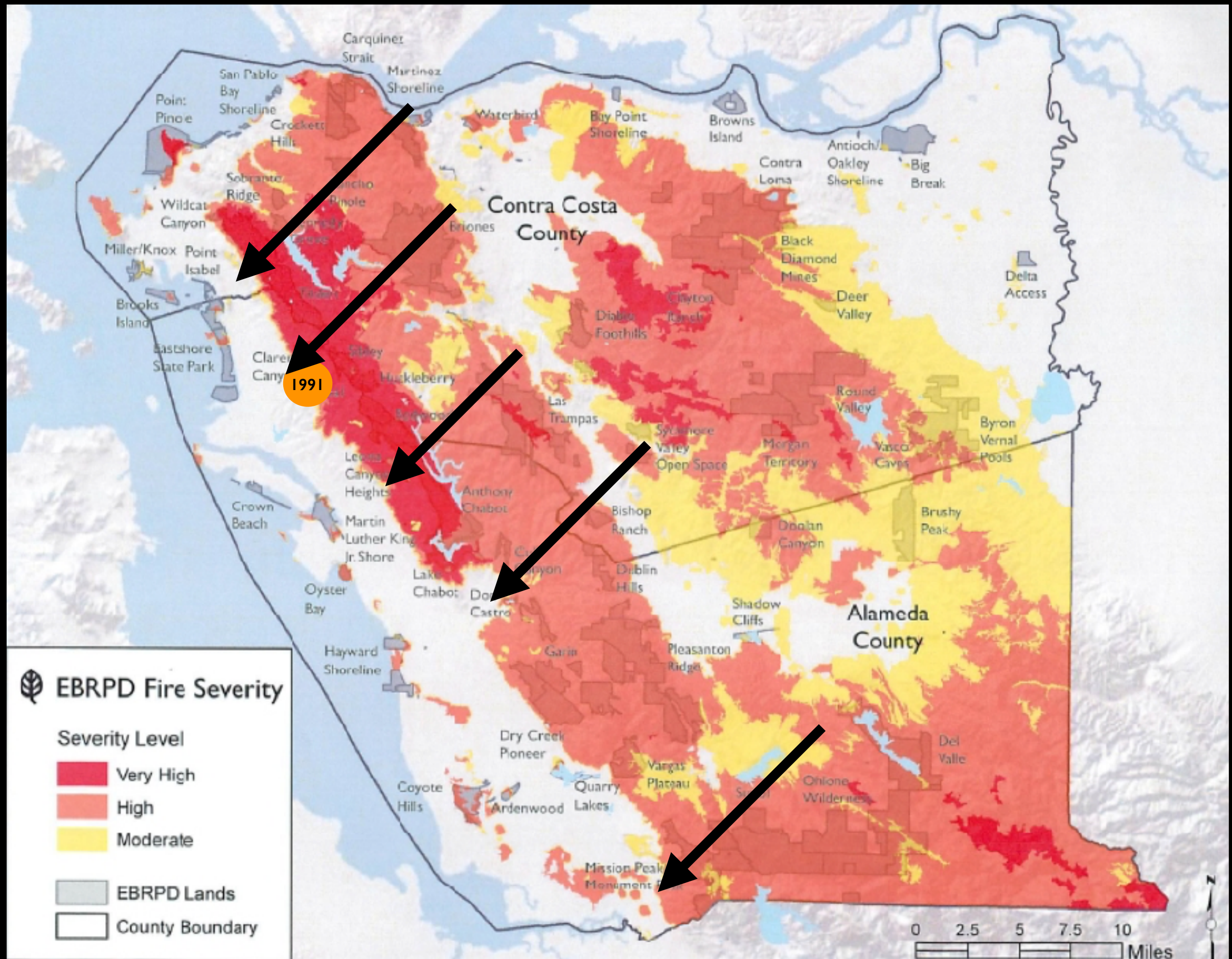
## CAL FIRE SPENT 2 DAYS SAVING LIVES BEFORE FIREFIGHTING COULD BEGIN

## N. BAY SIEGE OF FIRES





# COULD A 12 MILE LONG DIABLO WIND FIRE OR SIEGE OF FIRES OCCUR HERE ?







WILL BE BUSY  
AND NEED HELP



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.

