

Wildland Fire Risk Mitigation

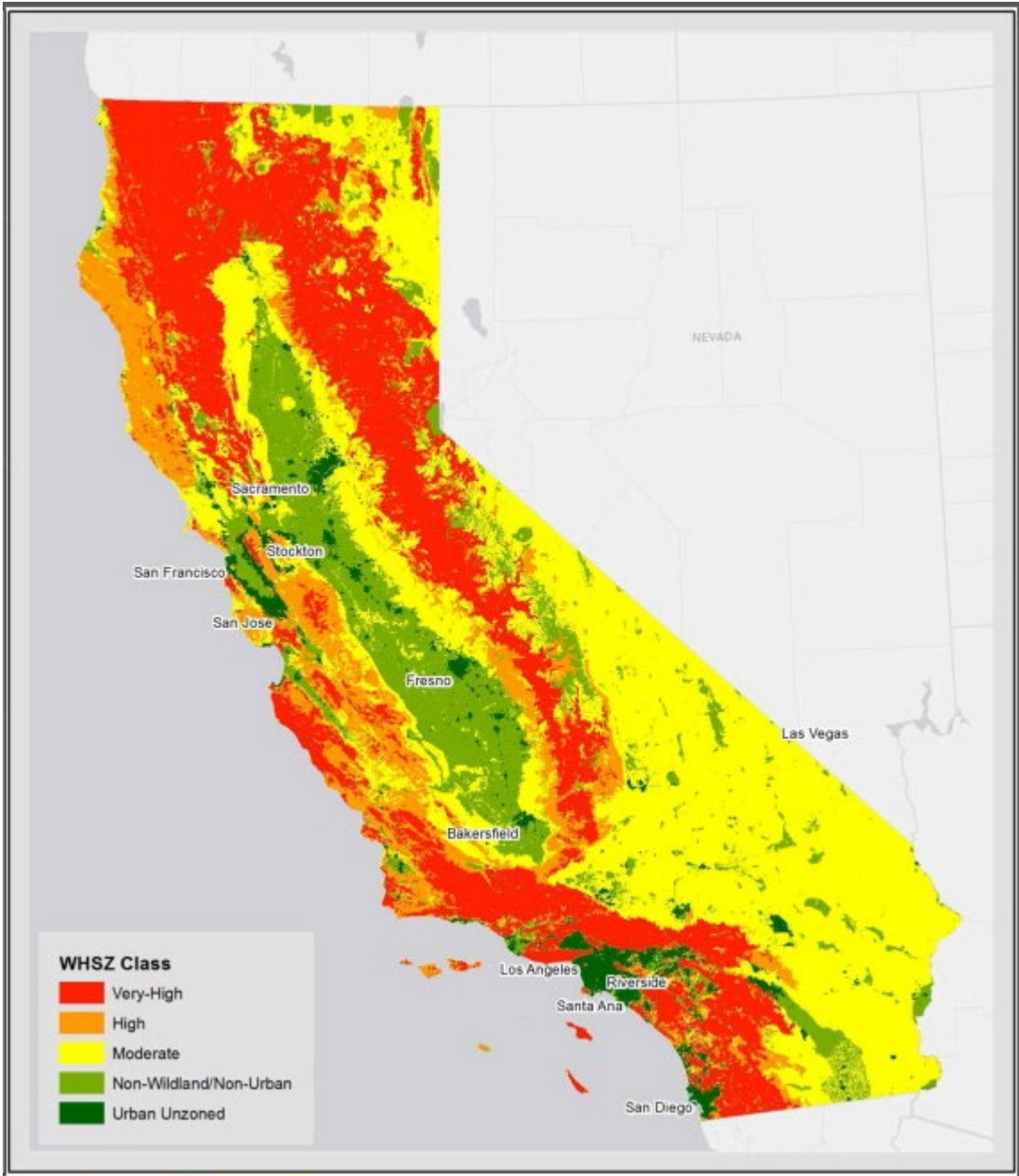
Agenda

- Define the Threat
- Risk Reduction
- Prevention and Suppression
- Policy vs Practice
- Market Forces
- Local Government Programs

DEFINE THE THREAT

Why Are We Here

- 1.5-3.5 Million Acres Burned per Year Pre-European Period
 - 3-5 Year Grass/Brush Fire Cycle
 - 25 Year Forest Fire Cycle
- 2017/2018 and 2020/21 Approached Lower End Historical Average Acres Burned
- 3 Million Homes with 11 Million Occupants built in the WUI
 - 1.7-2 Million of These are in Very High or High Hazard Areas
 - Few are built to Ember Resistant Construction Standards
- Climate Change has Compressed the Historical Rainy Season



Precipitation Anomaly, Last 60 Days

2018/09/10 - 2018/11/08



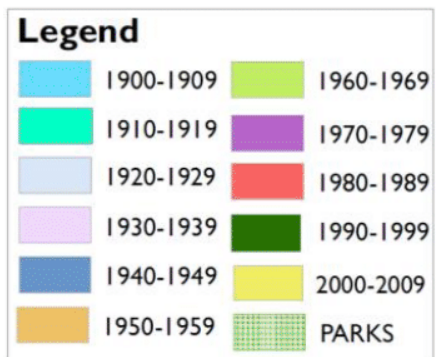
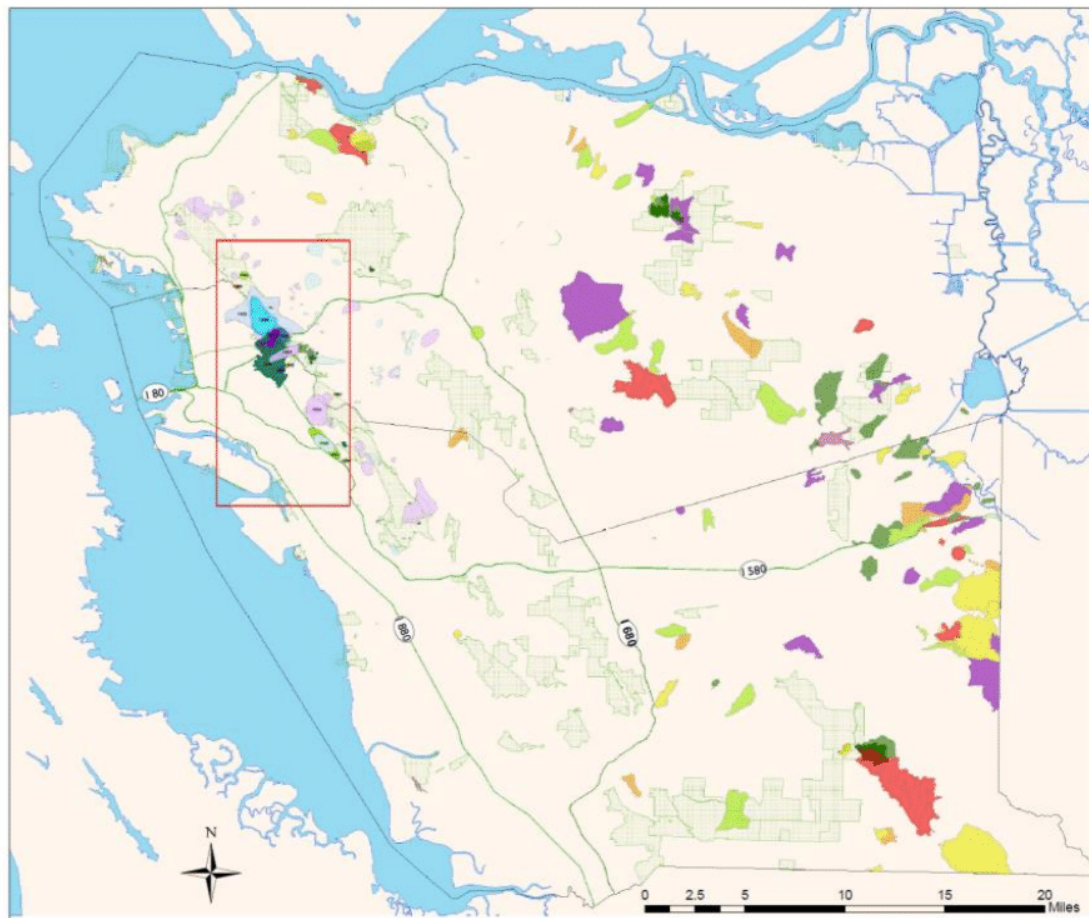
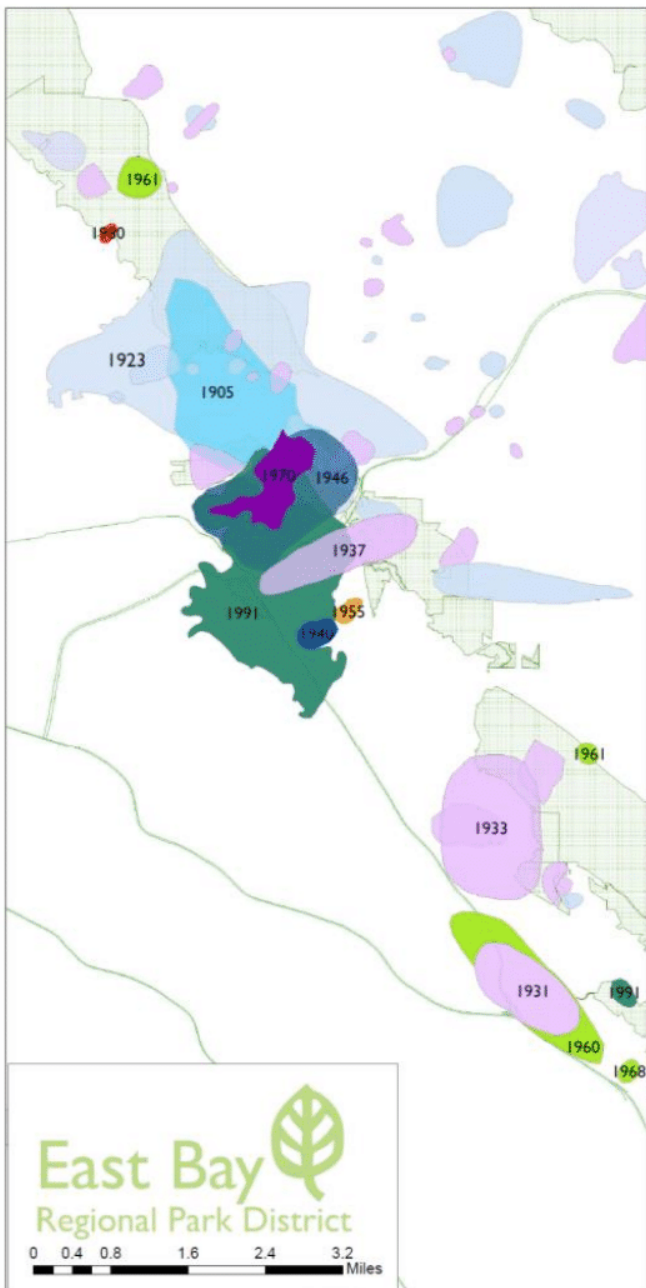
Disruption of Natural Cycle

1. Fire is natural and recurring feature of the natural cycle for most ecosystems
2. Non-native trees are poorly adapted to this climate and fire prone
3. Homes and residents create an imperative to stop fires
4. Climate change has delayed the onset of rainy season extending the exposure to fall Diablo/Santa Ana Winds
5. In the absence of fire or other fuel reduction efforts, fuel loading increases year after year setting conditions for high intensity and fast moving fires

Fire History in the East Bay

Learning from the past:

- Larger fires have occurred approx. every 20 years in the EB Hills (1905, 1923, 1937, 1946, 1970, 1991)
- Many smaller fires have occurred which were never mapped
- Fire should be an expected phenomenon, along with earthquakes (when, not if)
- To be resilient to the next fire, our efforts should take these facts into account



INFORMATION SOURCES

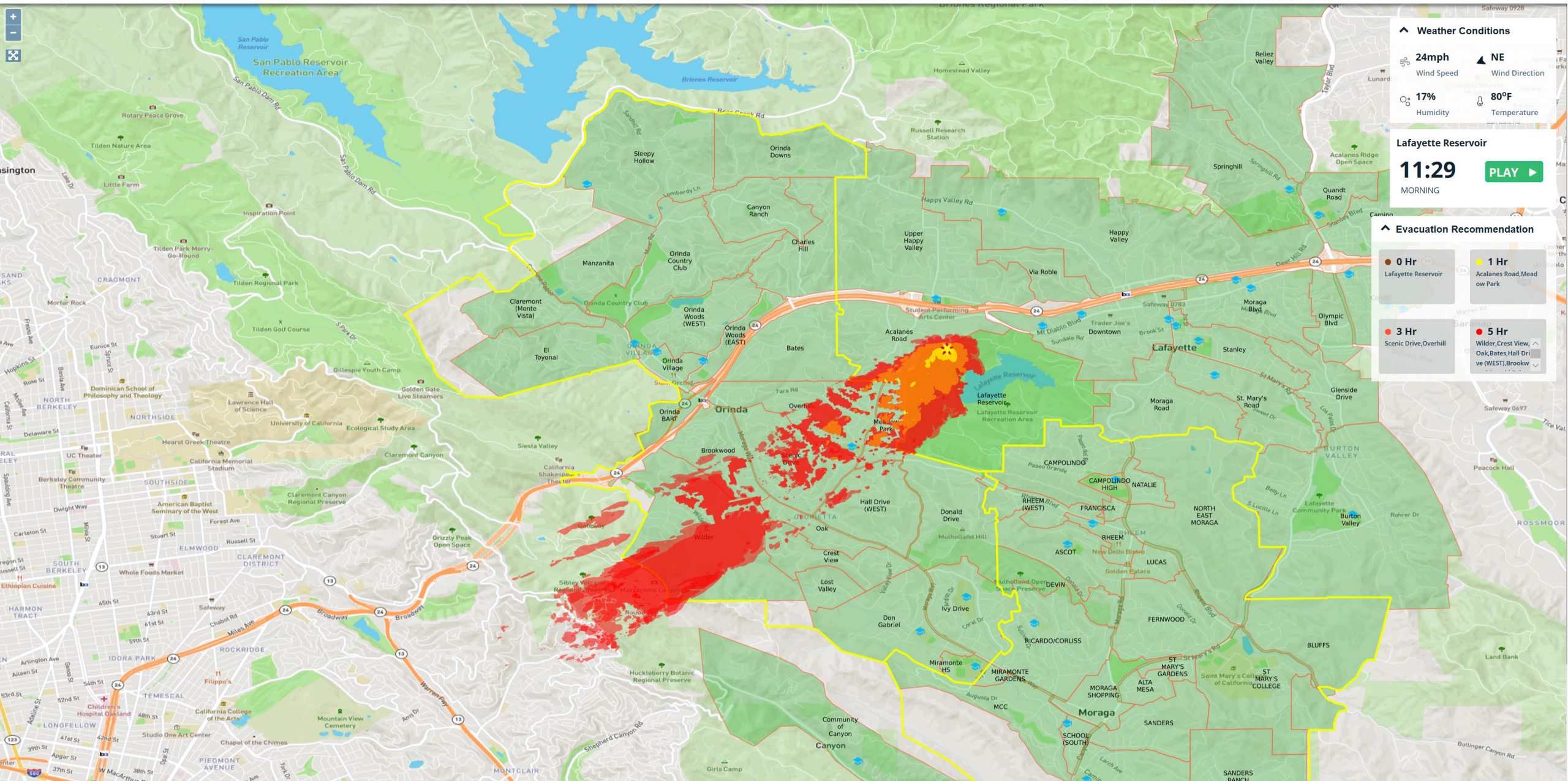
These fires have been mapped using the best available information, including boundaries described in newspaper articles, lookout tower records, and the CAL FIRE FRAP database. Particularly for early fires, boundaries are approximate. The fires shown here include all for which known data is available. However, many more fires occurred which were never mapped, therefore those displayed here represent a small percentage of this area's fire history.





Fire Spread Modeling

- Fire spread is a product of:
 - Fuel
 - Understory and Canopy
 - Topography
 - Weather
- Existing programs can rapidly calculate the spread of both ground component and three dimensional ember cast
- These programs can be automated
- Point of ignition is the only remaining variable



Weather Conditions

24mph Wind Speed
NE Wind Direction

17% Humidity
80°F Temperature

Lafayette Reservoir

11:29 **PLAY**

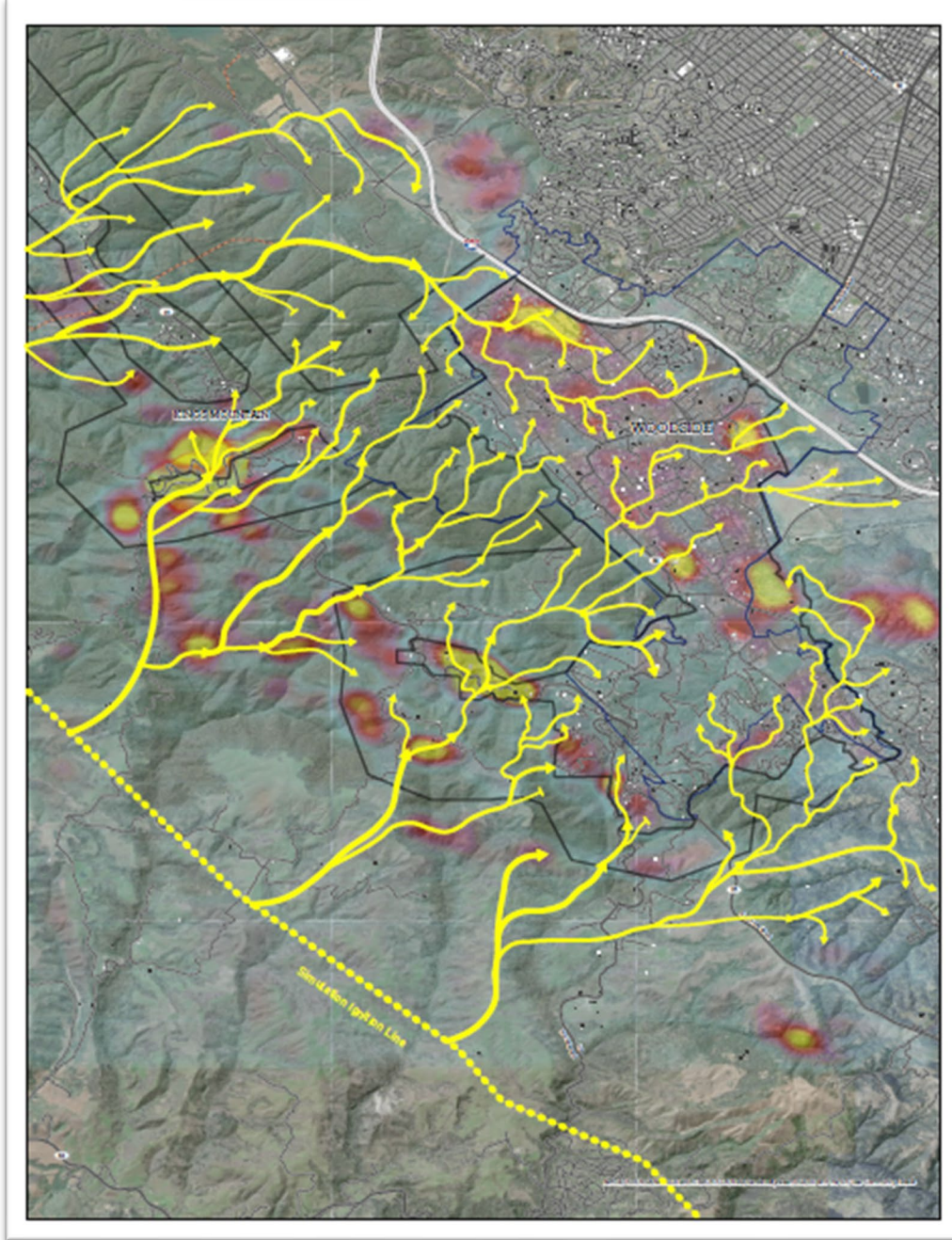
MORNING

Evacuation Recommendation

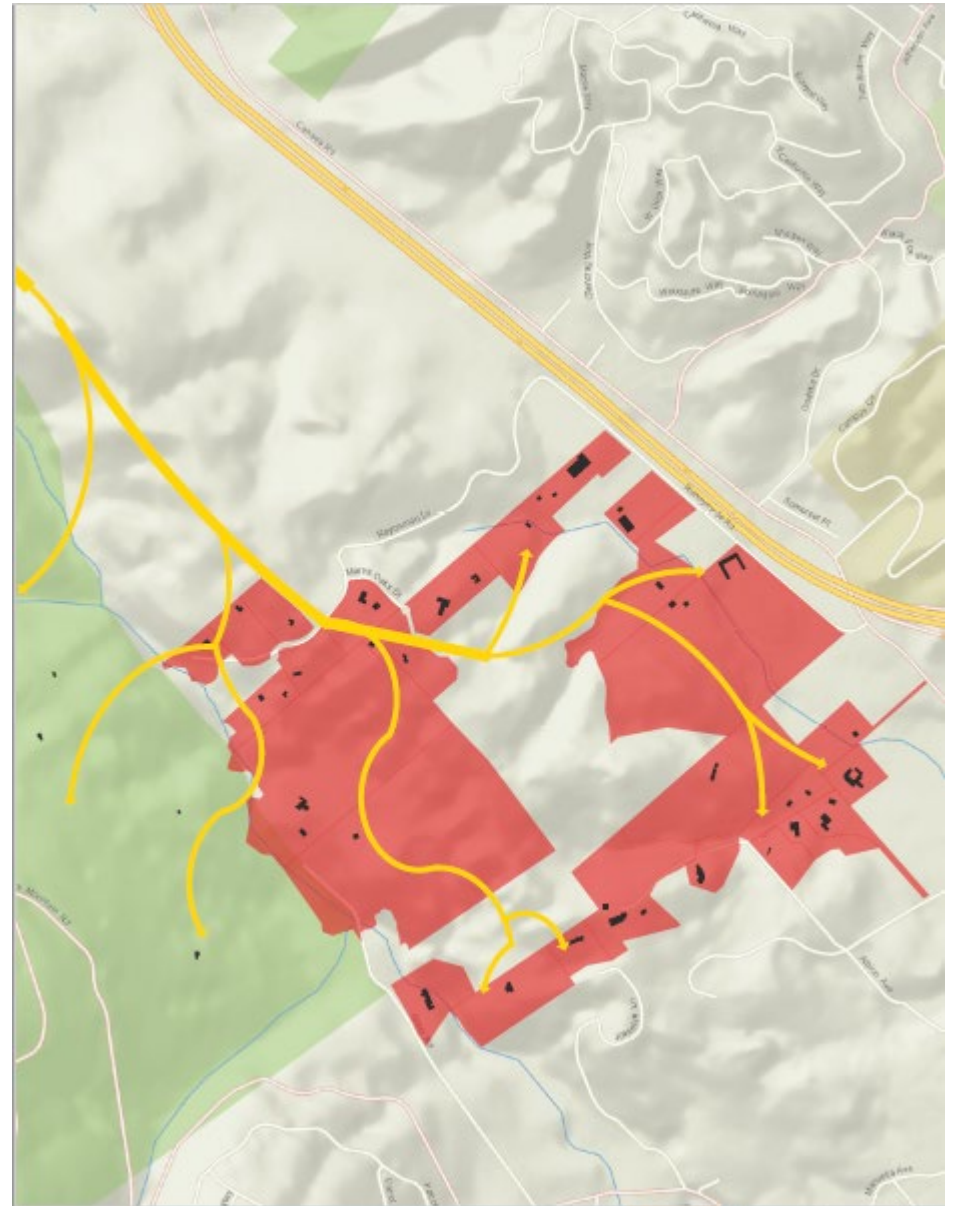
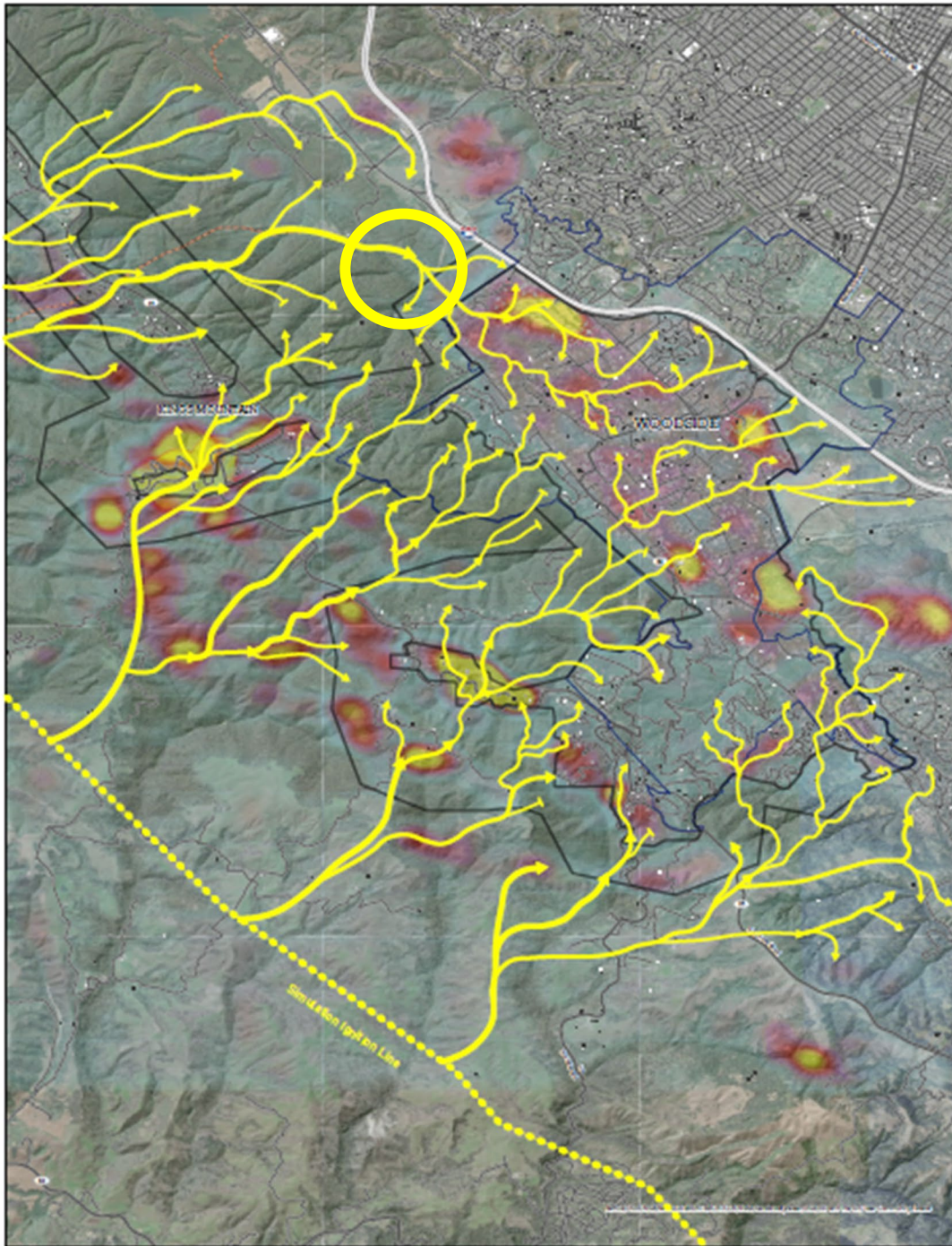
- 0 Hr** Lafayette Reservoir
- 1 Hr** Acalanes Road, Meadow Park
- 3 Hr** Scenic Drive, Overhill
- 5 Hr** Wilder, Crest View, Oak, Bates, Hall Drive (WEST), Brookwood Park



[Animation Here:](#)



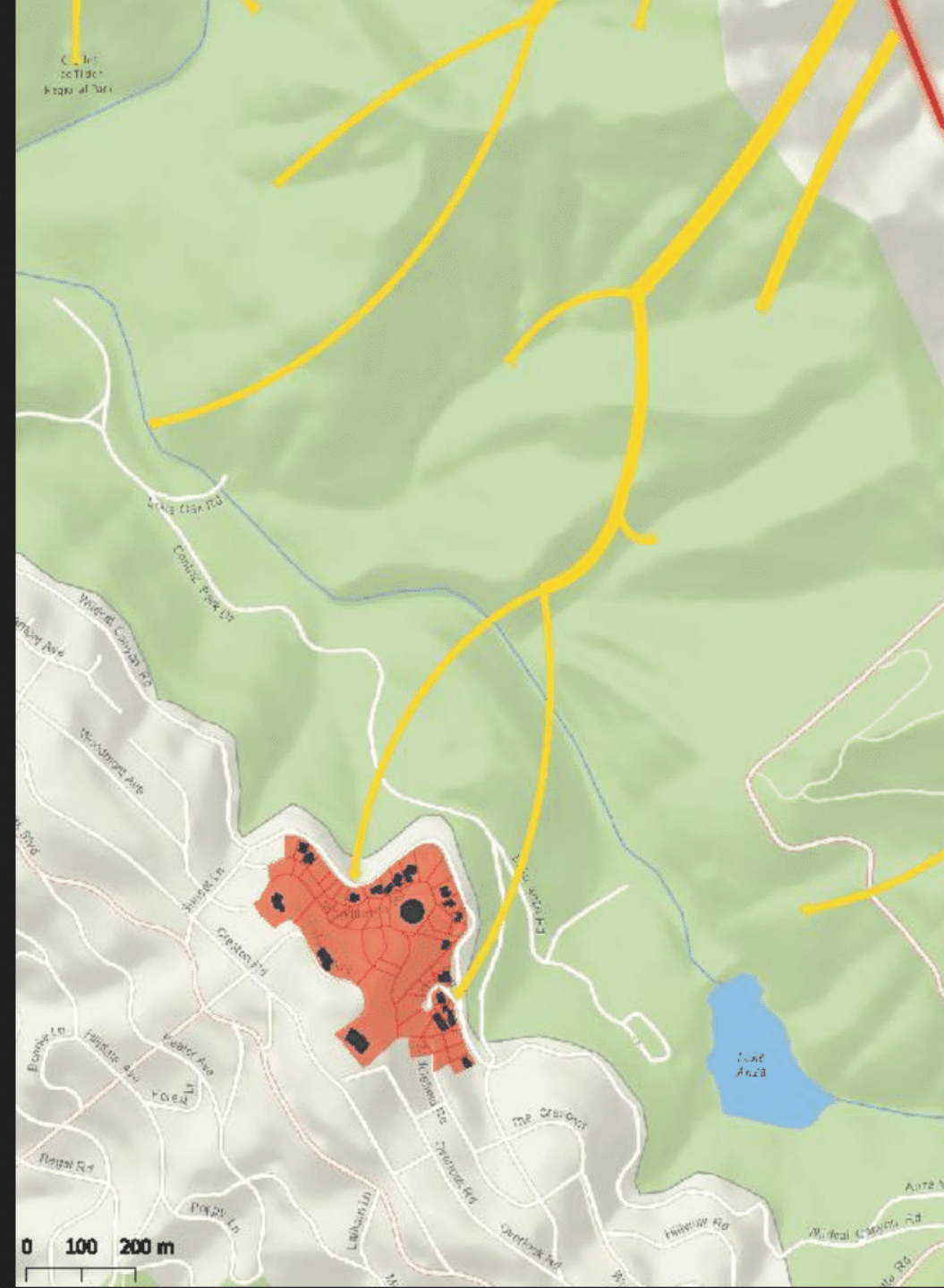
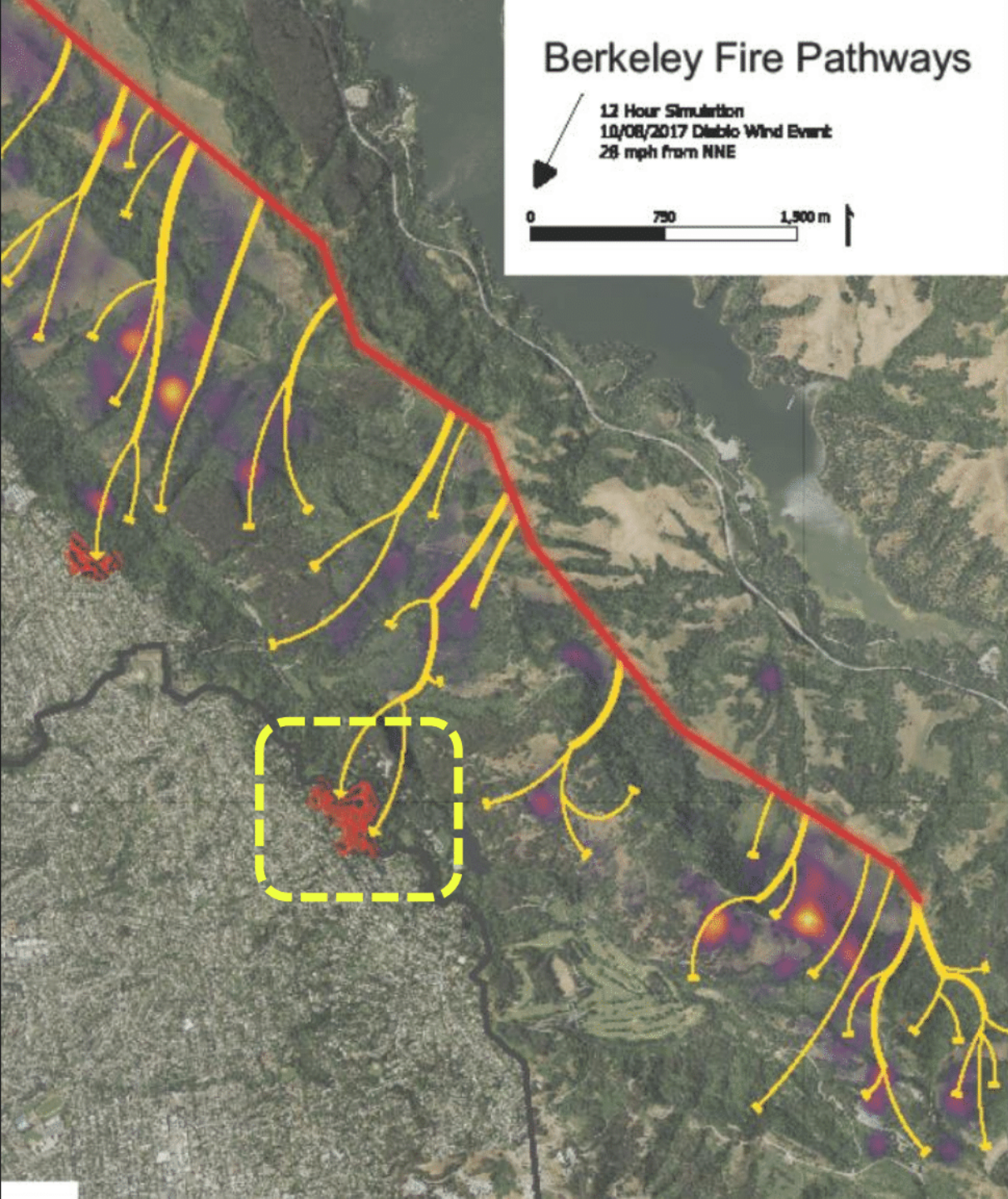
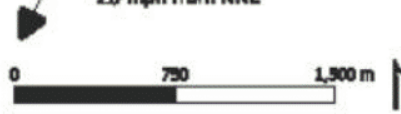
[Animation Here:](#)



[Animation Here:](#)

Berkeley Fire Pathways

12 Hour Simulation
10/08/2017 Diablo Wind Event
28 mph from NNE



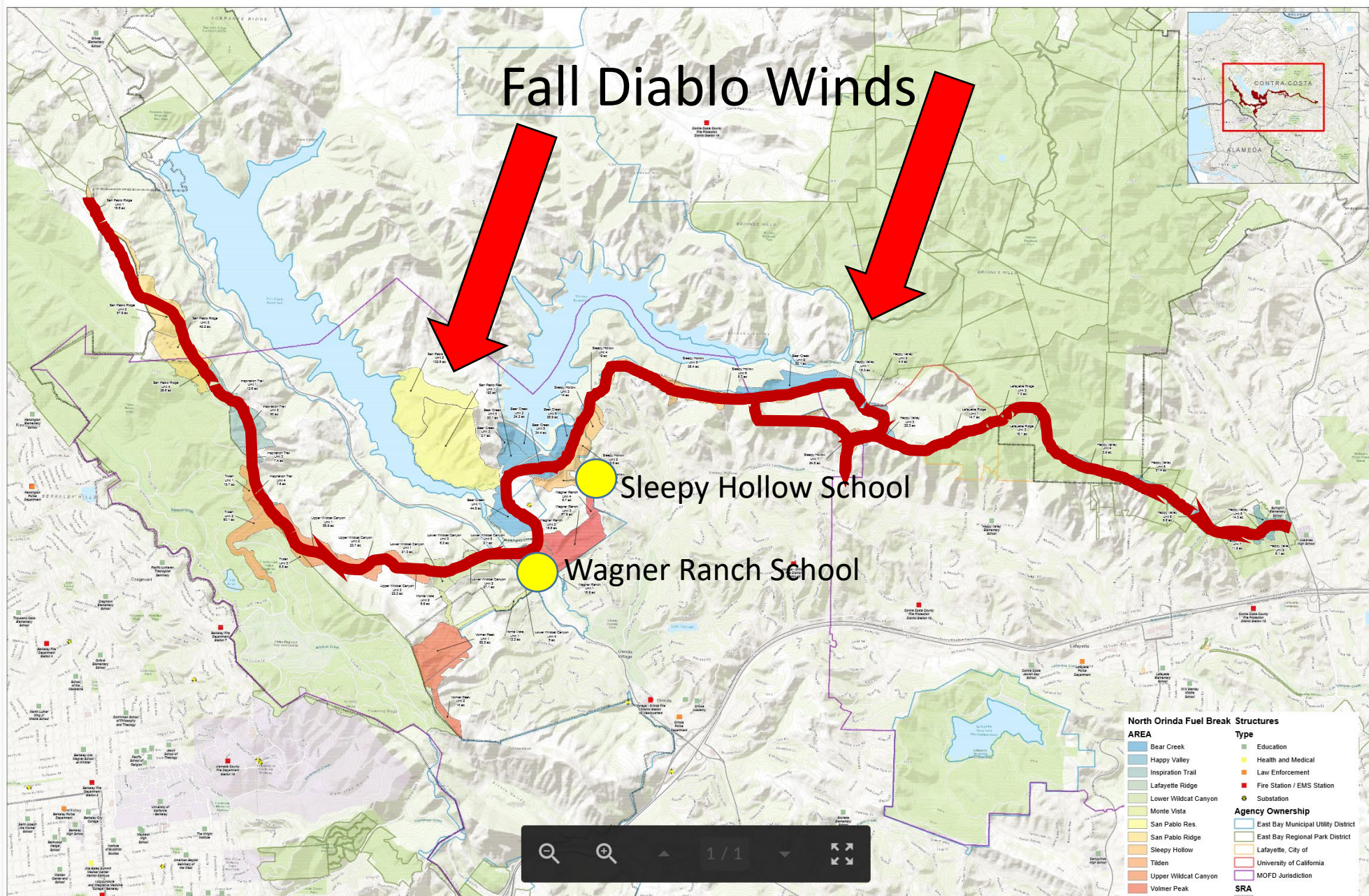


Risk Reduction



North Orinda Shaded Fuel Break

Datum: NAD 83, Created: 04/25/2016, T. By: [unreadable]
Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, Swisstopo, IGN, Esri, [unreadable], [unreadable], Esri Japan, METI, Esri China (Hong Kong), Swisstopo, [unreadable] and the GIS User Community

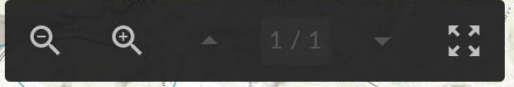


Fall Diablo Winds

Sleepy Hollow School

Wagner Ranch School

North Orinda Fuel Break Structures	
AREA	Type
Bear Creek	Education
Happy Valley	Health and Medical
Inspiration Trail	Law Enforcement
Lafayette Ridge	Fire Station / EMS Station
Lower Wildcat Canyon	Substation
Monte Vista	
San Pablo Res.	
San Pablo Ridge	
Sleepy Hollow	
Tilden	
Upper Wildcat Canyon	
Volmer Peak	
Wagner Ranch	
	Agency Ownership
	East Bay Municipal Utility District
	East Bay Regional Park District
	Lafayette, City of
	University of California
	MOFD Jurisdiction
	SRA
	SDA







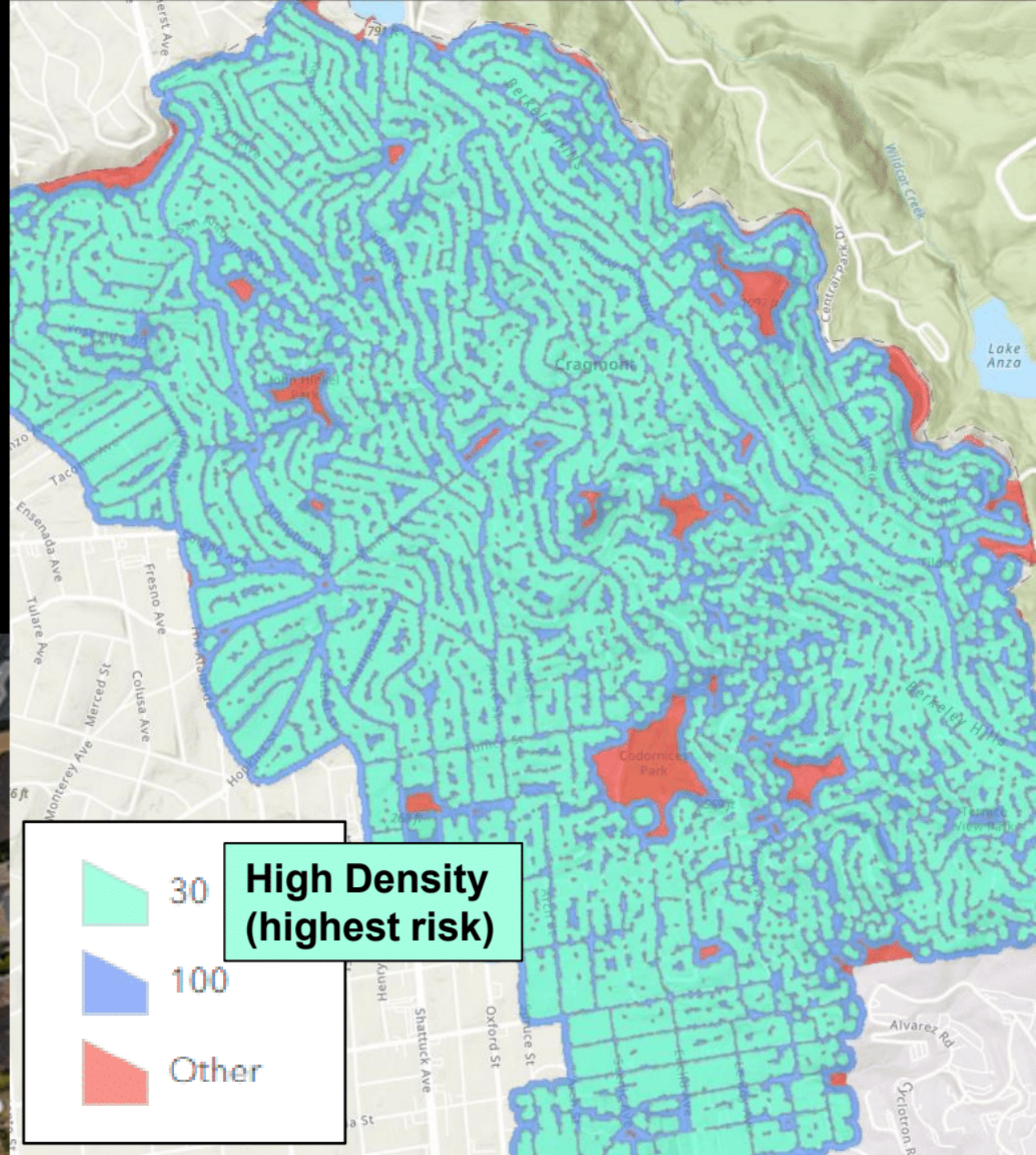
DEFENSIBLE SPACE ZONES



Berkeley Challenge: Structure Separation

Closer structures = faster fire spread

Most of Berkeley hills are
high density (6 ft – 30 ft apart)



Prevention and Suppression

Wildland Fire Suppression

- Firefighters are very effective against early stage fires with a rapid response
- Under extreme weather conditions, fires can spread more quickly than the suppression response (relative speed)
- When fuel loads will not support rapid fire spread, fires do not spread rapidly
- When conditions around values at risk do not support fire spread, we do not lose lives and structures....setting conditions for managed fire
- Prevention improves conditions
- Prevention is low cost, high impact with few barriers to execution at the micro scale

And many hands make for a light load



Policy vs Practice



Fire Safety

- Public Resource Code 4291 requires defensible space around structures

BUT.....

(f) As used in this section, “person” means a private individual, organization, partnership, limited liability company, or corporation

Which excludes publicly owned buildings and propane tanks from fire safety requirements

AND.....

There are no state minimums for fire prevention measures beyond 100’ from privately owned structures



State Minimums and Local Amendments

- State minimums for fire safety are established in PRC 4291, CCR Title 14, and the CFC
 - PRC 4291 excludes publicly owned buildings and propane tanks
 - CCR Title 14 does not include standards for undeveloped land
 - CFC is limited to structures

BUT....

- PRC 4117
 - Any county, city, or (fire) district may adopt ordinances, rules, or regulations to provide fire prevention restrictions or regulations that are necessary to meet local conditions of weather, vegetation, or other fire hazards. Such ordinances, rules, or regulations may be more restrictive than state statutes in order to meet local fire hazard conditions.



Market Forces



Market Forces

- Insurance
 - Wildfire is largely abstract, but insurance is annual
 - Insurance risk is actually held by unregulated reinsurers
 - FAIR plan TIV increased 5x 2019-2022
- Mortgage Holders
 - Have 30 year investment in a parcel
 - Traditional indifference is changing
 - <http://faculty.haas.berkeley.edu/stanton/pdf/fire.pdf>
- Muni Bond Rating
 - Wildfire risk can will increase borrowing costs
- <https://www.hoover.org/news/hoover-veteran-fellows-headline-program-mitigating-california-wildfire-risk>



Market Forces



CAS RESEARCH PAPER

CATASTROPHE MODELS FOR WILDFIRE MITIGATION: QUANTIFYING CREDITS AND BENEFITS TO HOMEOWNERS AND COMMUNITIES

By Peggy Brinkmann, Nancy Watkins, Cody Webb, Dave Evans, Gabriele Usan, Michael Glavan, Lillian Zhang, and Carolyn Prescott: Milliman Inc. Tom Larsen and Grace Lee: CoreLogic Inc.



CoreLogic



[Report Here:](#)

A MILLIMAN AND CORELOGIC REPORT
Prepared with funding from the California Resilience Challenge Grant

Town of Paradise California Resilience Challenge Task 1 to Task 4

Risk Reduction, Climate Change, and Insurance Premiums

April 2023

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CORELOGIC
Kent David
Fan Lei
Byron Melish



Milliman CoreLogic

[Report Here:](#)

Local Government Programs

WILDLAND URBAN INTERFACE DIVISION



- **Wildland Urban Interface Division**
- **Community Wildfire Protection Plan (CWPP)**
- **Fire Safe Berkeley Website**
- **FireWise Neighborhood Program**
- **Berkeley Emergency Map (ZH)**
- **Evacuation Time Estimate Study**

Actions:

Improve the wildfire resistance of your property and neighborhood:

1. Create (& maintain) Defensible Space
2. Harden your home (against embers)



Create Defensible Space

Defensible Space acts as a buffer to wildfire and embers.

It can slow or halt the progress of fire that would otherwise engulf your property and your neighbors.

The city requires that you maintain 100 feet of Defensible Space from any structure - **wildfire does not stop at property lines.**

Science: The 0'-5' area around your home and other structures **IS THE MOST** important area.

**applies to parcels in fire zones 2 and 3*



Harden our Homes

Increase home's resistance to heat, flames, and embers:

- Wire mesh behind vents / or engineered vents
- Gutter covers
- Clearing combustible materials under deck or within 5' of structure
- Double-paned windows
- Focus on sides facing other structures < 100'



Education & Outreach

- Firewise coaching
- WUI Ambassador Program
- Updated website, direct mail, social media, e-mail and community presence



berkeleyfire.com/firesafe

Please share this video with
neighbors and friends.

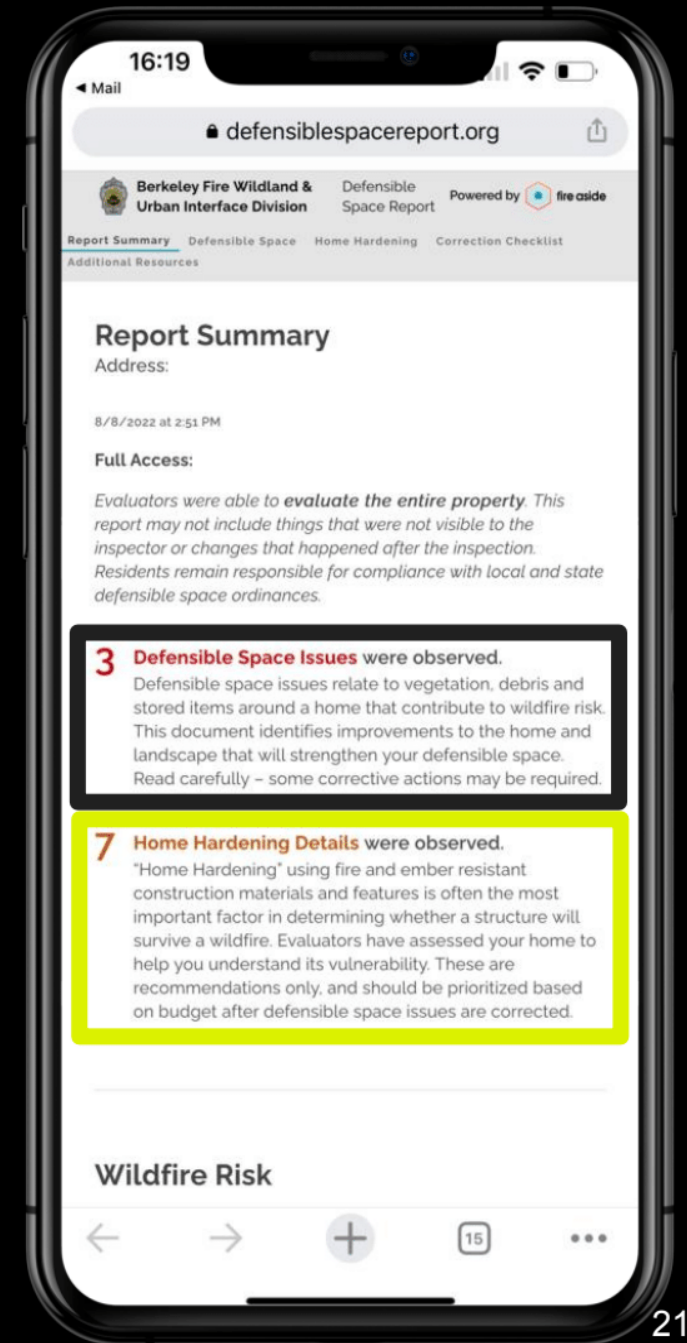


FIREWISE USA[®]
RESIDENTS REDUCING WILDFIRE RISKS

Defensible Space Inspection (DSI)

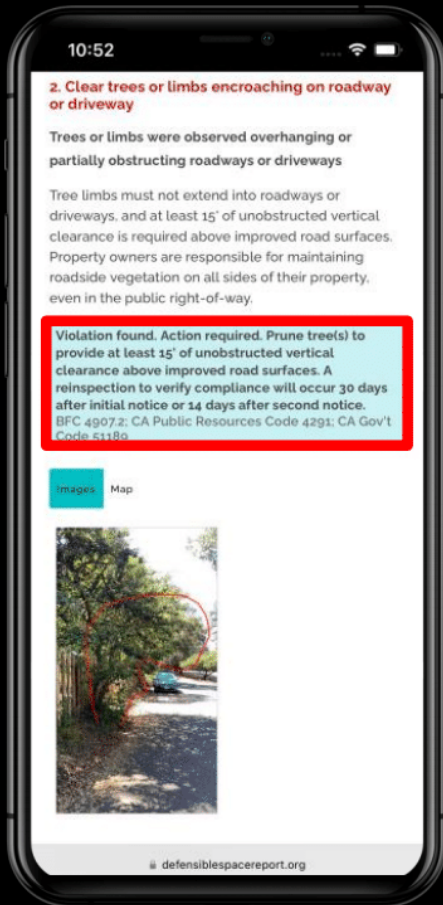
Every inspection will generate a detailed report that explains what discoveries are violations vs recommendations.

- **What:** An easy to read evaluation of your property
- **Why:** Provides a roadmap to make your property more Fire Safe
- **When:** Occurs annually in Zone 2 & 3 (VHFDSZ)
- **Where:** 1:1 or sidewalk inspection & door hangar

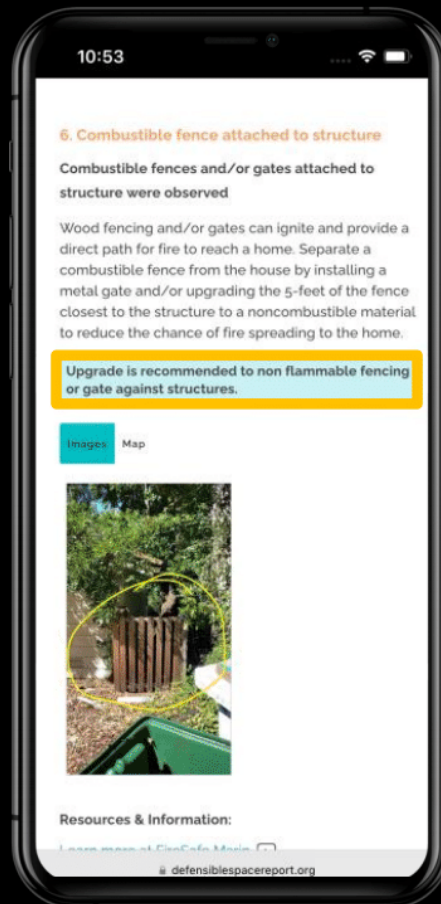


Helping residents understand the DSI Report

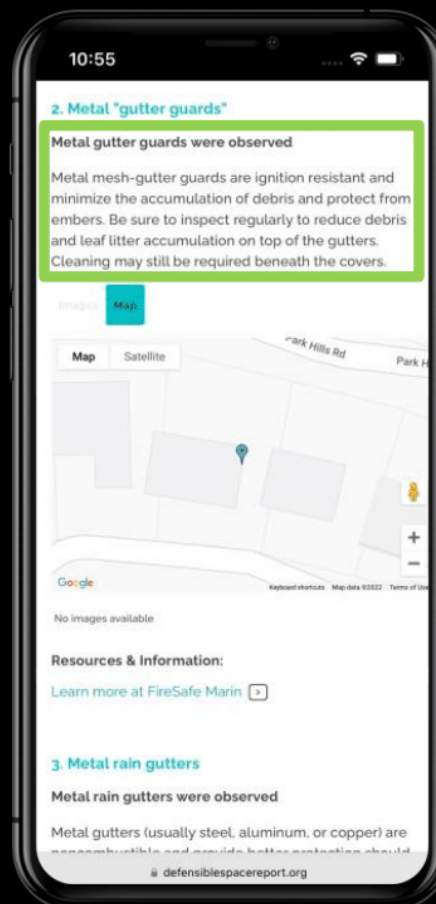
Violation



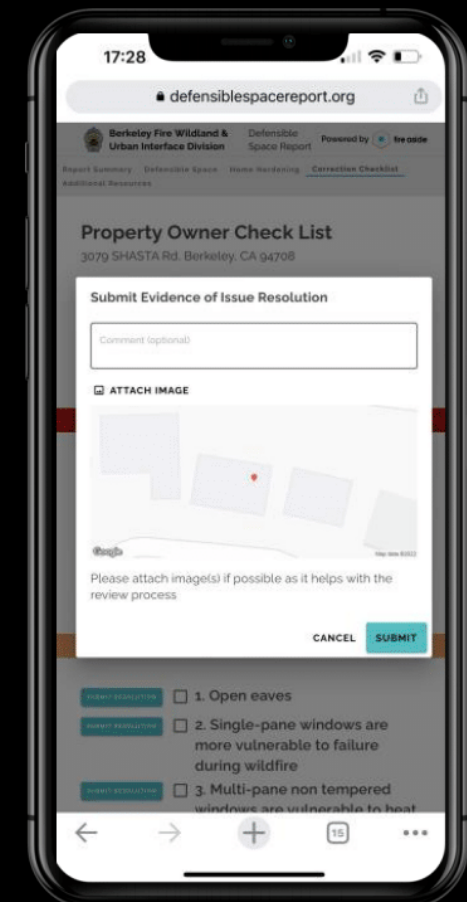
Recommendation



+ Reinforcement



Correction



ChipperDay

Re-redesigned and expanded...

“This is an excellent program! I will be able to remove a lot more brush from my property because I can do it on my time schedule rather than just the designated dates.”

Thank you so much for making it available!”

<https://www.chipperday.com/berkeley>



Resident Assistance Program *for Home Hardening*

For screen material for vents and gutters.

Qualifying residents are eligible to receive free fire rated 1/16" stainless mesh.

Residents responsible for installation and maintenance.

****Pilot Program****



Resident Assistance Program *for Defensible Space*

One-time assistance to help residents meet Defensible Space best practices, especially implementing Zone 0.

- Requires a Defensible Space Inspection pre & post work.
- Vegetation work must be driven by results of the City inspection.
- Reimbursement if you use a trusted landscaper/gardener or City contractors can do the work
- Residents are responsible for on-going maintenance work

APPLY HERE



****Pilot Program****



Moraga-Orinda Fire Protection District

- Centralized projects
 - Fuels Breaks
 - Increased grazing
 - Engagement with state and special district landowners
- Education
 - Presentations, FireWise Neighborhoods, Social Media, Service Clubs
- Incentives
 - Community Chipping, Vent and Gutter Program, FireSafe Council Grants
- Enforcement
 - Defensible Space (100'), Perimeter Fuel Breaks, Roadside Clearance, Building Codes (WUI FA)