

# TREE MORTALITY & DROUGHT CONDITIONS



**Glenn Barley**

**San Bernardino-Inyo-Mono Unit**

**Chris Anthony**

**Amador-Eldorado Unit**

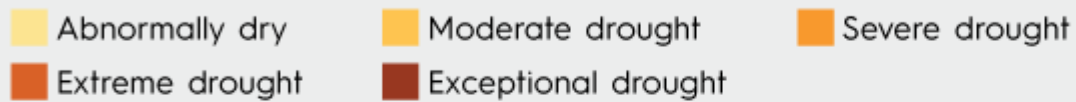




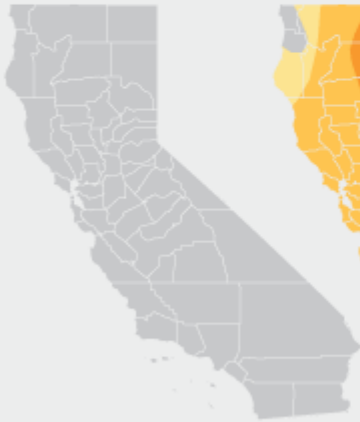
# Five Years of Drought

## A Record-Breaking Drought

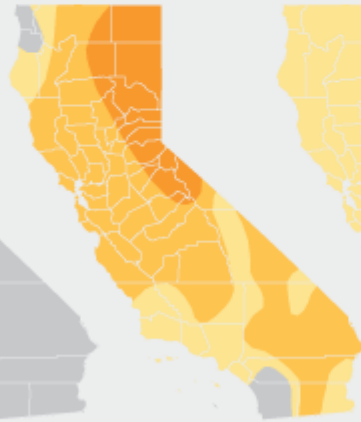
41% of the state is facing “exceptional drought” (the most severe kind).



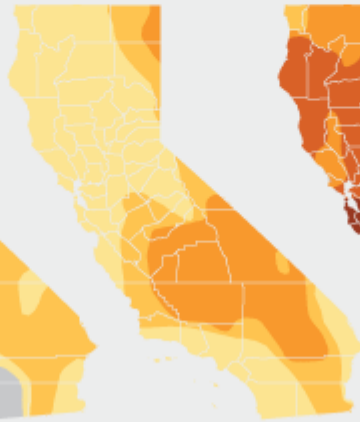
2011



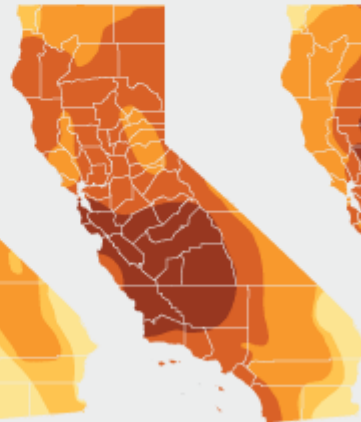
2012



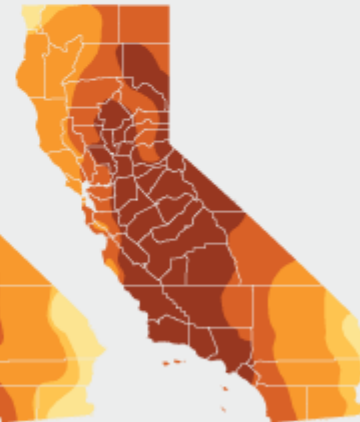
2013



2014



2015

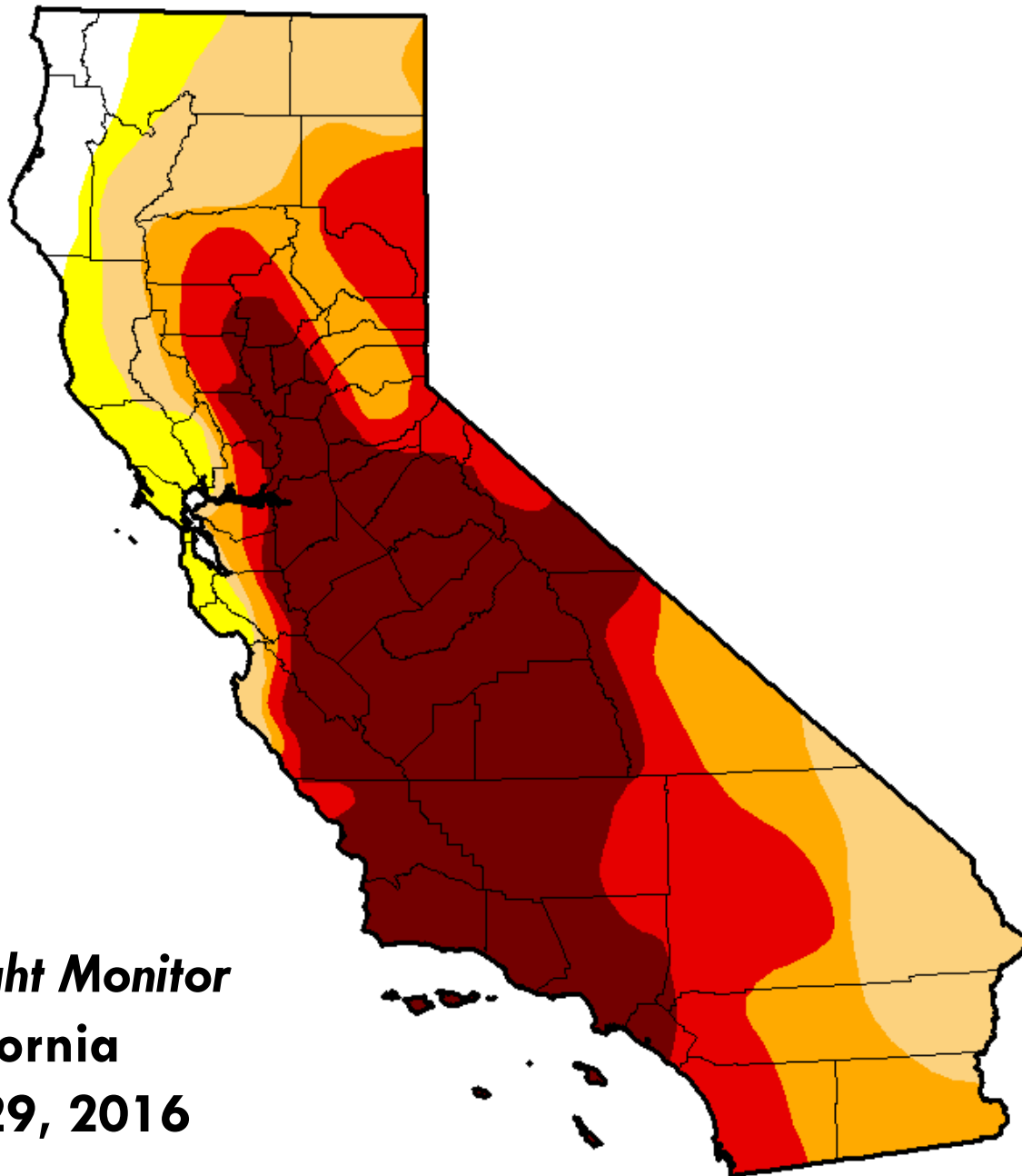


SOURCE: U.S. Drought Monitor

VISUAL NEWS



***U.S. Drought Monitor***  
**California**  
**March 29, 2016**







No Significant Fuel Modification

+

Development

+

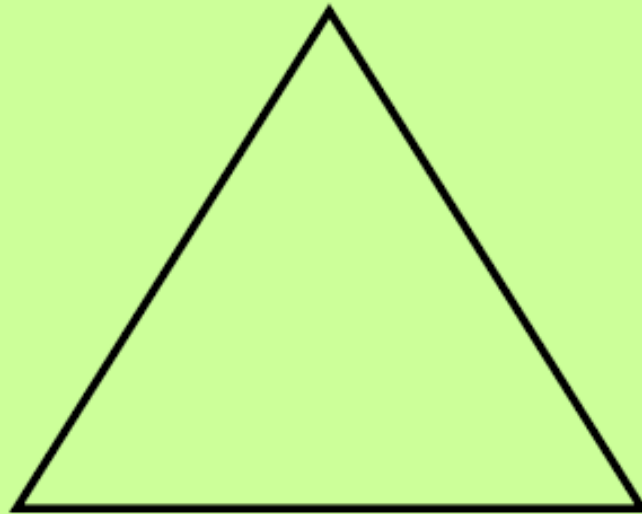
Fire Suppression

=

Aging and Overstocked Forest



Bark Beetle  
Population



Tree/Forest  
Conditions

Weather/Climate  
Conditions

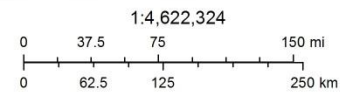
“The Perfect Storm”



# 2012 Mortality



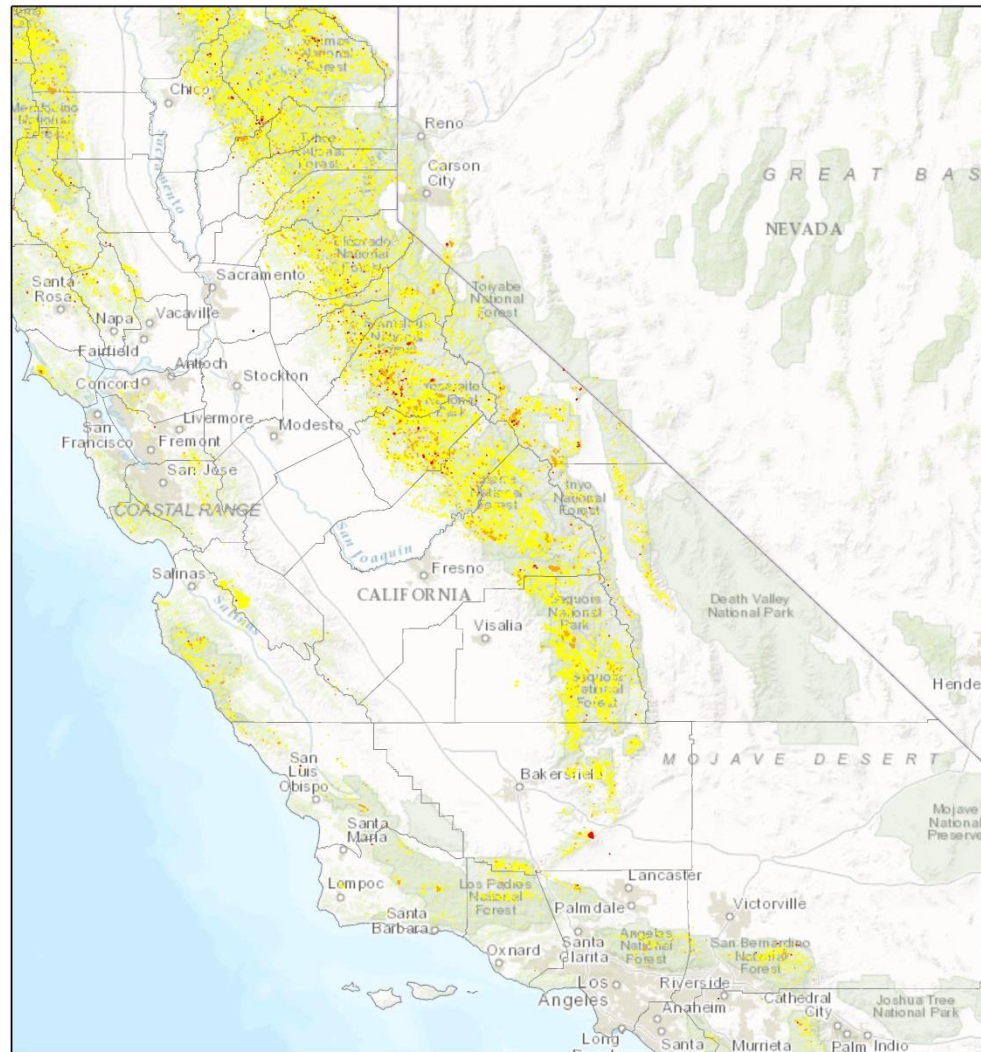
April 7, 2016



Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), Swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



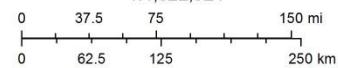
# 2013 Mortality



April 7, 2016

- County Boundaries
- >0 - 5 (Background Mortality)
- 5 - 15
- 15 - 40
- 40+

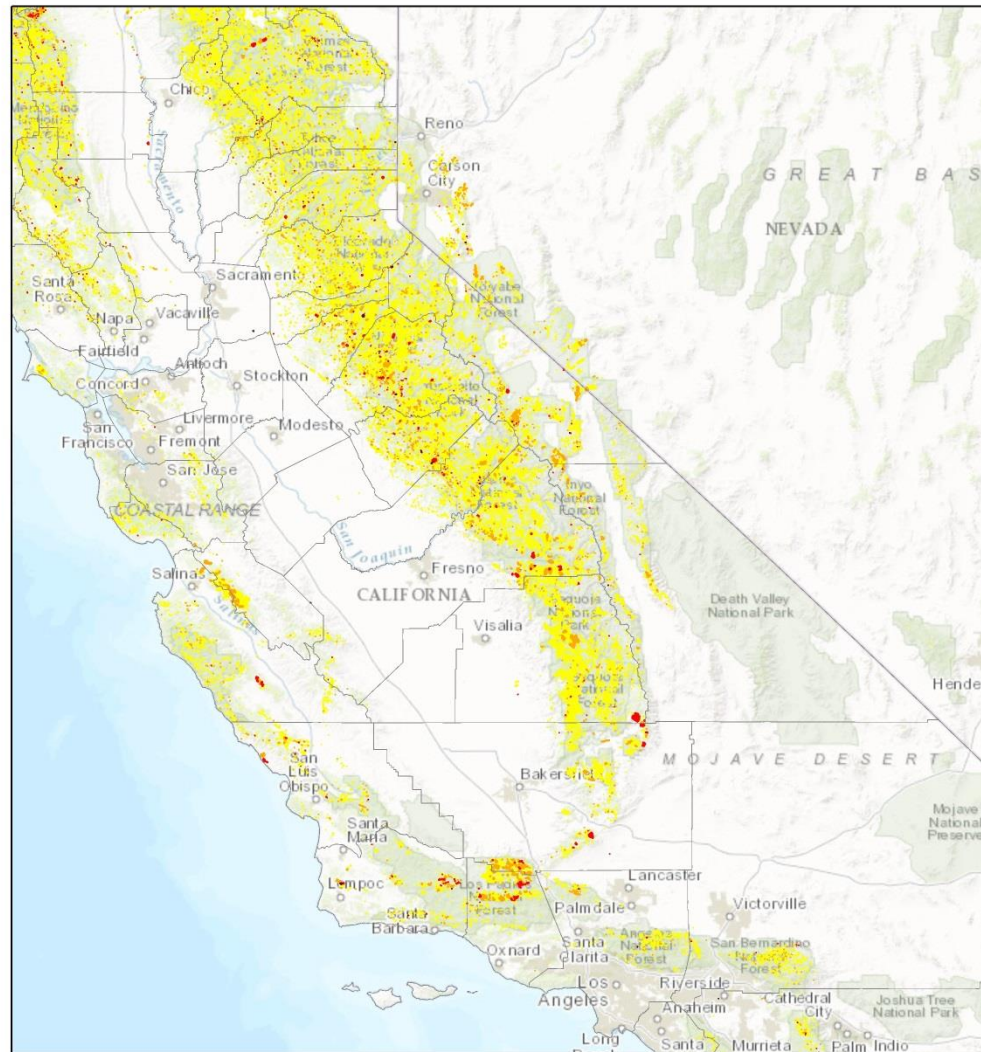
1:4,622,324



Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), Swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



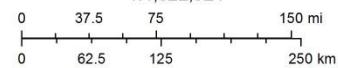
# 2014 Mortality



April 7, 2016

- County Boundaries
- >0 - 5 (Background Mortality)
- 5 - 15
- 15 - 40
- 40+

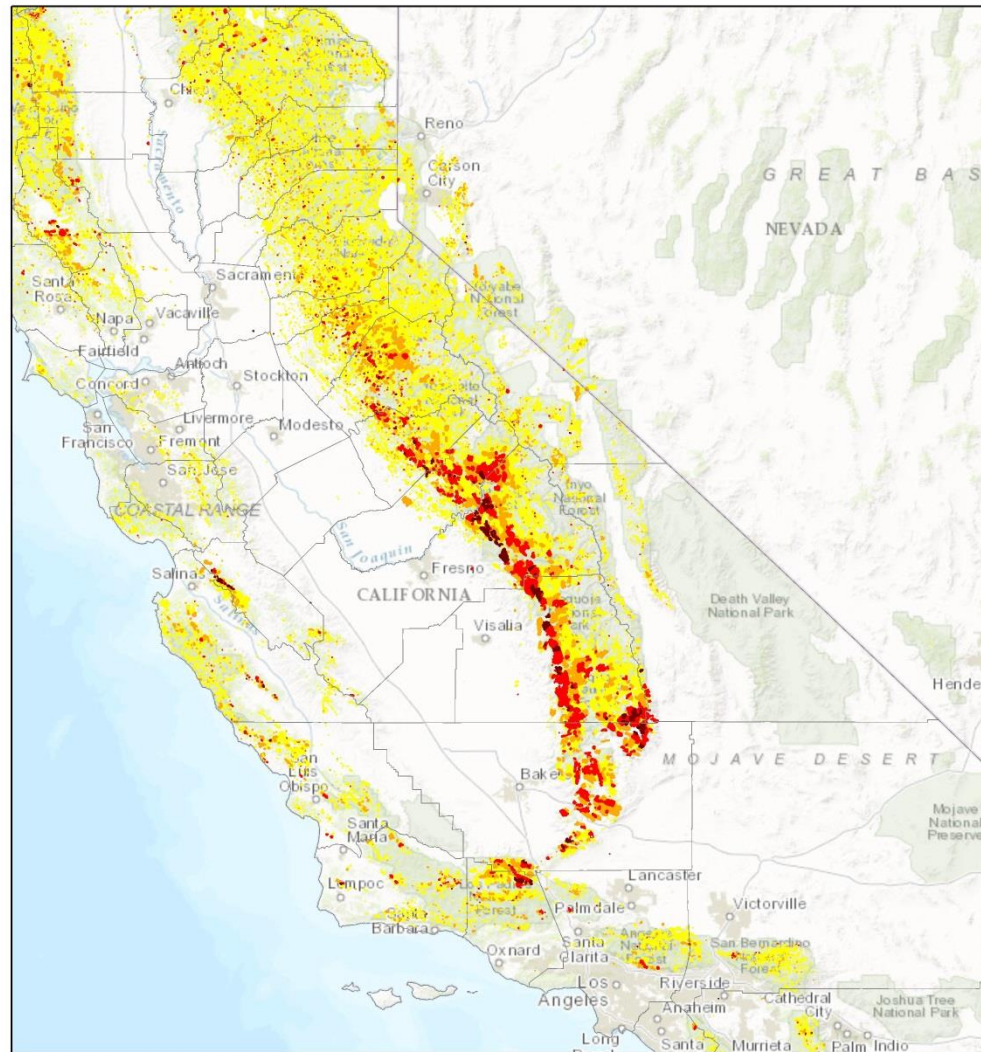
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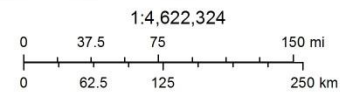
Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), Swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



# 2015 Mortality



April 7, 2016



Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), Swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



# Mariposa County March 21, 2015





# Mariposa County October 11, 2015





An aerial photograph of a vast forested mountain slope. The forest is composed of numerous coniferous trees. The color of the foliage varies across the slope, with a distinct gradient from green in the lower and middle sections to a brownish-orange hue in the upper sections. The terrain is rugged, with ridges and valleys visible. In the far distance, more mountain peaks are visible under a clear sky.

November 11, 2015 Madera/Fresno County line



# Mariposa County

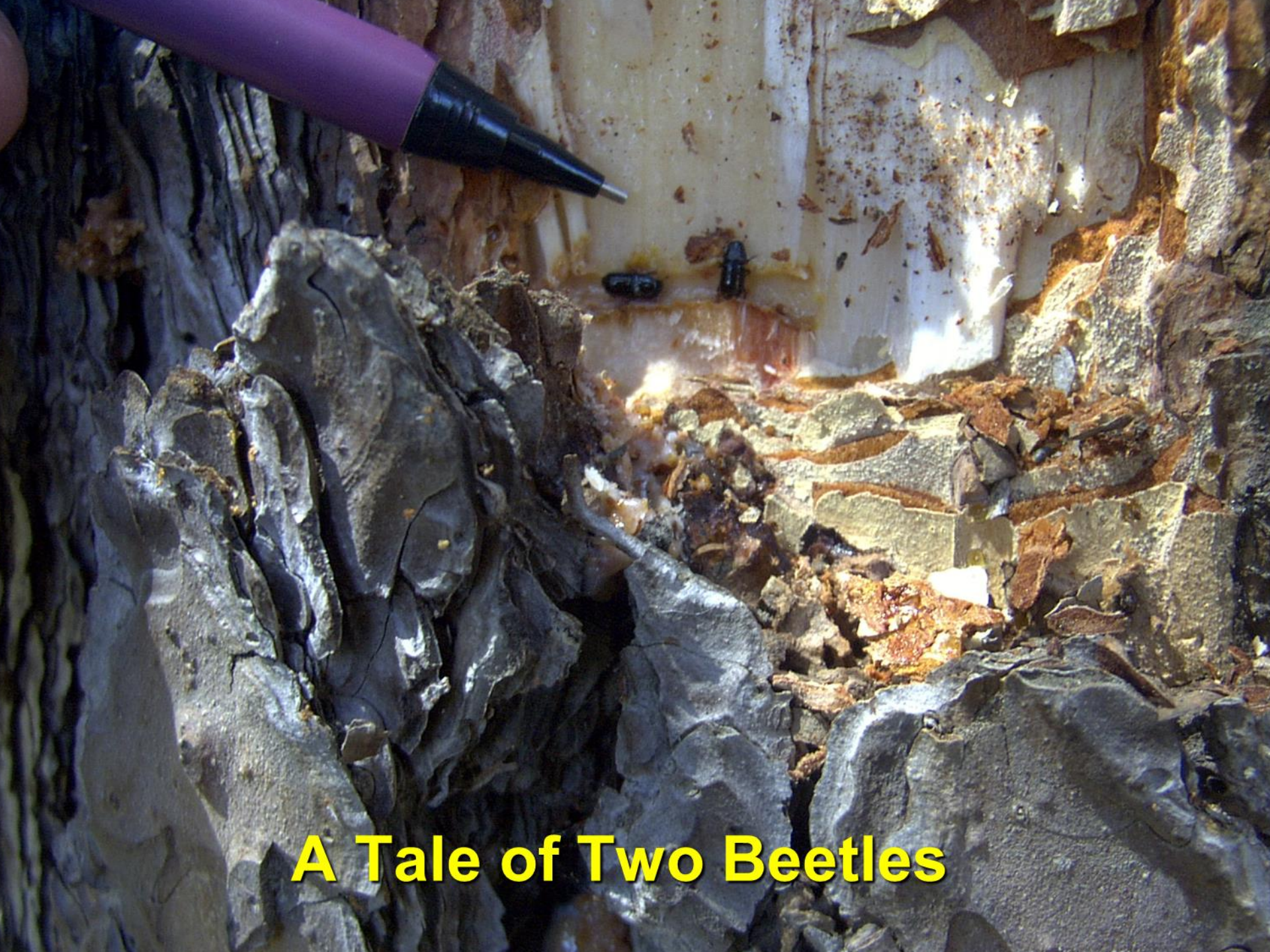


□ March 21, 2015



□ October 11, 2015



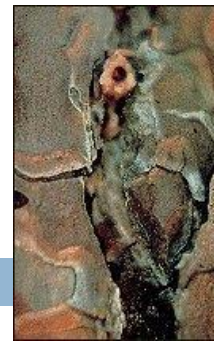


## **A Tale of Two Beetles**

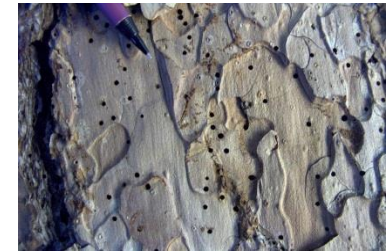




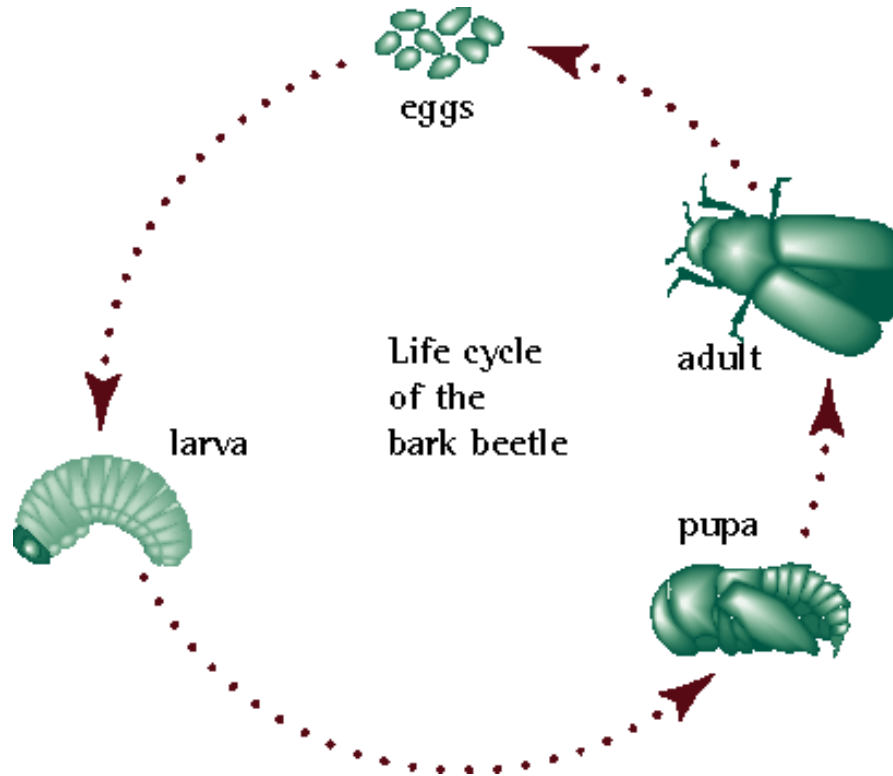
Eggs hatch into larva



Emerge and Attack



Larva pupate into  
adult beetle



Larva feed under the bark



## Generic Bark Beetle Life Cycle





Mountain Pine Beetle



Western Pine Beetle



Red Turpentine Beetle



Ips Beetle



Fir Engraver Beetle





Ponderosa Basin October 20, 2015



**Executive Department**  
**State of California**

**PROCLAMATION OF A STATE OF EMERGENCY**

**WHEREAS** the State of California is experiencing record drought conditions, which have persisted for the last four years; and

**WHEREAS** on January 17, 2014, I proclaimed a State of Emergency to exist throughout the State of California due to severe drought conditions; and

**WHEREAS** a lack of precipitation over the last four years has made trees in many regions of California susceptible to epidemic infestations of native bark beetles, which are constrained under normal circumstances by the defense mechanisms of healthy trees; and

**WHEREAS** these drought conditions and resulting bark beetle infestations across broad areas have caused vast tree mortality in several regions of the state, with the United States Forest Service estimating that over 22 million trees are dead and that tens of millions more are likely to die by the end of this year; and

**WHEREAS** recent scientific measurements suggest that the scale of this tree die-off is unprecedented in modern history; and



# TREE MORTALITY TASK FORCE

## FORMATION

**19 DIRECTIVES**

**8 WORKING GROUPS**

**79 ENTITIES**



**Cal OES**  
GOVERNOR'S OFFICE  
OF EMERGENCY SERVICES







**Cal OES**  
GOVERNOR'S OFFICE  
OF EMERGENCY SERVICES

# **TREE MORTALITY TASK FORCE**

In Response to the State of  
Emergency Proclamation

Incident Action Plan  
2016



# **Chairs:** Director Pimlott, Wade Crowfoot, Director Ghilarducci

## **Task Force Leaders:**

Glenn Barley

Chris Anthony

Whitney Bray

## **Liaison Officers**

CSAC

RCRC

CAL FIRE

## **8 Working Groups:**

Forest Health and Resilience

Mapping and Monitoring

Prescribed Fire

Public Outreach

Regulations

Resource Allocation

Utilization- Bioenergy

Utilization- Market  
Development



# All Local Resources Have Been Exhausted

- Private landowners are failing to mitigate the dead trees on their property due to excessive and unplanned costs
- Riverside and San Bernardino Counties BOS provided emergency funds; however, those funds have been spent
- State and county agencies cannot meet the demand for services (budgets and staff)
- Public lands budgets and policies are not able to treat tens of thousands of dead trees
- Public utilities are severely impacted





# Intent of the Taskforce

- **To implement the activities described in the Governor's Proclamation**
- **Statewide Taskforce supports local coordination groups by:**
  - ▣ **Identifying High Hazard Zones (HHZs)**
  - ▣ **Work to remove trees in HHZs**
  - ▣ **Identify potential storage sites**
  - ▣ **Distribute equipment across counties**
  - ▣ **Address regulatory impediments and work to resolve them**
  - ▣ **Maintain, develop, and expand the use of bioenergy using feedstock from HHZs**
  - ▣ **Work to identify and promote wood markets**
- **Core to this effort is local organizations**



# Equipment



## TREE MORTALITY TASK FORCE EQUIPMENT

Type: Chipper  
Make: Morbark  
Model: Beaver M18RX



Type: Track Chipper  
Make: Bandit Industries  
Model: 250XP Track



Type: Sawmill  
Make: Wood-Mizer  
Model: LT70 Super Hydraulic



Type: Air Burners, Inc  
Make: Air Curtain Burner  
Model: S-220 Portable Firebox



January 22, 2016



## TREE MORTALITY TASK FORCE EQUIPMENT

Type: Excavator (for Masticating)  
Make: Caterpillar  
Model: 323F



Type: Mulching Head (for Cat 323E Excavator)  
Make: RDM Series  
Model: 52EX



Type: Compact Track Loader  
Make: Caterpillar  
Model: 299D2 XHP



Type: Wheel Loader  
Make: Caterpillar  
Model: 938M



January 22, 2016



# Forefront Action Items



- ❑ **Prevailing Wage Determination**
- ❑ **CDA Funding**
- ❑ **Outlet for Trees Being Cut**
  - ❑ **Bioenergy contract extensions**
  - ❑ **Market development**
  - ❑ **Sawmills full**
  - ❑ **Storage sites**
- ❑ **Financial Assistance For Private Landowners**



# Addition of Counties to TMTF

- Focus has been on 6 “priority” counties (Tuolumne, Mariposa, Madera, Fresno, Tulare, Kern)
- Anticipate addition of counties to the north based on:
  - ▣ Declaration of Local Emergency
  - ▣ County wide level of significance
  - ▣ Local coordination team
  - ▣ Hazard tree removal plan
  - ▣ Policy direction of the Chairs



# Counties and Local Structures

- Counties are encouraged to establish a core planning team/ local coordination group consisting of decision makers from the county and various agencies to assist in the development of a Tree Mortality Hazard Tree Removal Plan
- This group is encouraged to gather and share resources, address regulatory oversight, and discuss facilitation of the tree removal plan
- Individuals/Agencies to consider:
  - ▣ County Supervisors with significant mortality within district, County Administrative Officer, County OES, County Roads Dept, CAL FIRE and/or County Fire, USFS, Fire Safe Councils, Utilities, Caltrans, Cal OES, Sheriff's Office, Local Tribal Leaders, etc.



# Public Outreach



## □ Websites

- [www.treetaskforce.org](http://www.treetaskforce.org) or [www.fire.ca.gov/treetaskforce/](http://www.fire.ca.gov/treetaskforce/) (Internal)

- Contains materials and information related to the Task Force and monthly meetings (i.e. FAQ's, meeting minutes and agendas, workgroup pages etc.)

- [www.prepareforbarkbeetle.org](http://www.prepareforbarkbeetle.org) or [www.readyforwildfire.org/Bark Beetles Risk](http://www.readyforwildfire.org/Bark%20Beetles%20Risk) (Public)

- Contains materials geared toward the public (i.e. assistance for private landowners, dead tree removal information, etc.)

## □ Tree Mortality Viewer Overview

- Link to viewer can be accessed from both websites or at <http://egis.fire.ca.gov/TreeMortalityViewer/>



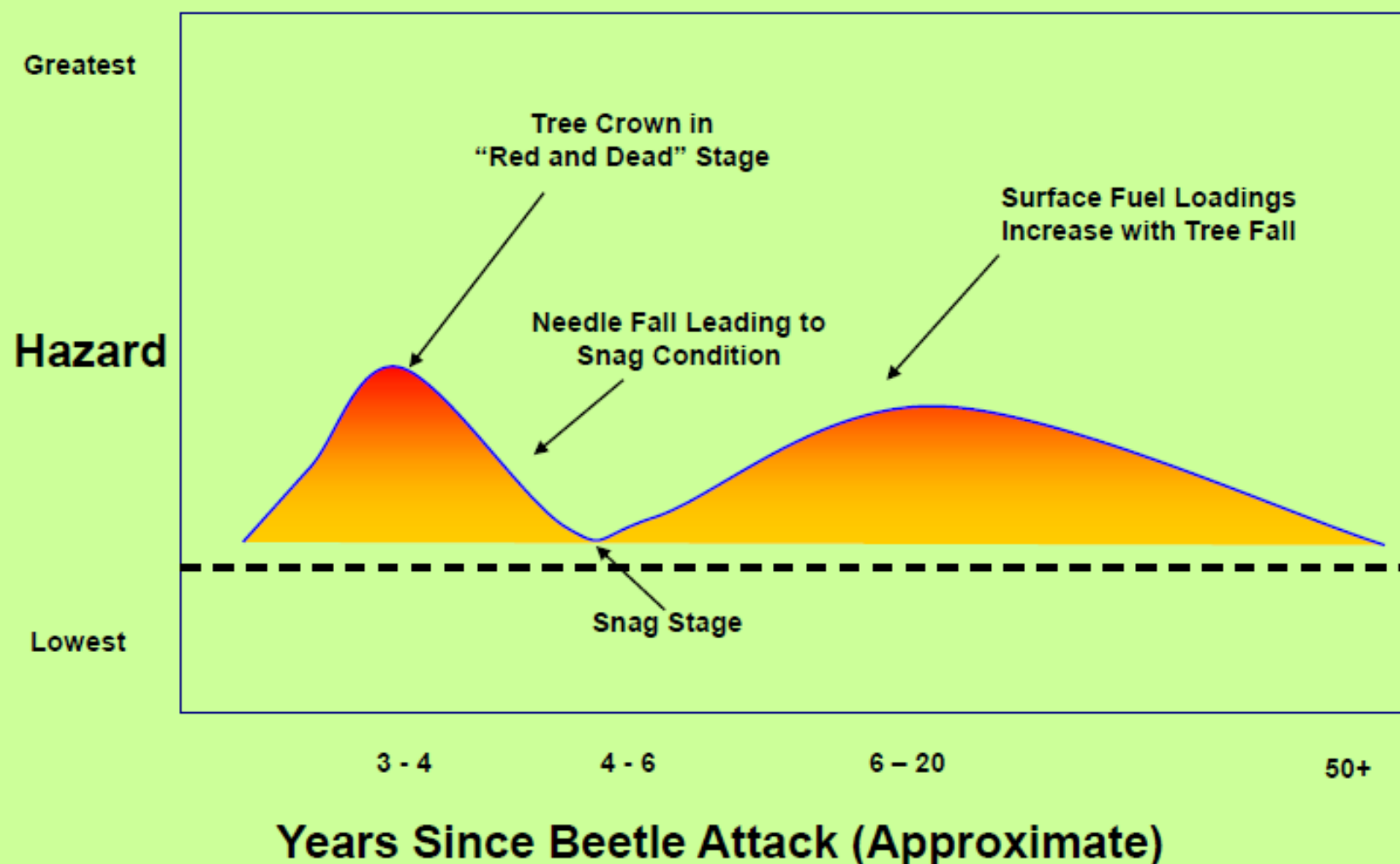
# Fire



Photo courtesy of Mike Ryan (RMRS)



# Fuel Profile Hazard Associated with MPB Mortality





# Implications For Fire Protection

## □ Tree Mortality Effect on Fire Behavior

### □ Short Term

- Red Trees
- Pine Needles
- Increase Fire Spread and Intensity

### □ Mid Term

- Standing Dead
- Burnout and Failure of Standing Dead Trees
- Extended Mop up

### □ Long Term

- Downed Heavy Fuels
- Resists Control
- Long Residence Time & Extended Mop up



# The End

- Thank you for your attention!
- Questions?

