

Managing California's Invasive Beetles without Regulations

**Katie Harrell
California Firewood Task Force**

CA Invasive Urban and Wildland Forest Pests

- Goldspotted oak borer
- Invasive shot hole borers
- *Phytophthora ramorum*

Goldspotted Oak Borer

- Native to Arizona and Mexico
- Introduced on firewood
- 1st Detected San Diego Co, 2004
- Tens of thousands of trees killed



Hosts

- Coast live oak
- California black oak
- Canyon live oak
- Engelmann oak
(rare instances)



California Distribution

- Los Angeles
- Orange
- Riverside
- San Diego



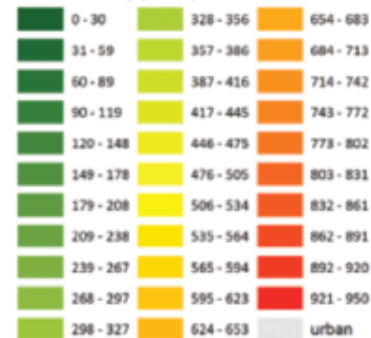
Risk

➤ Sea level to 6,000 feet

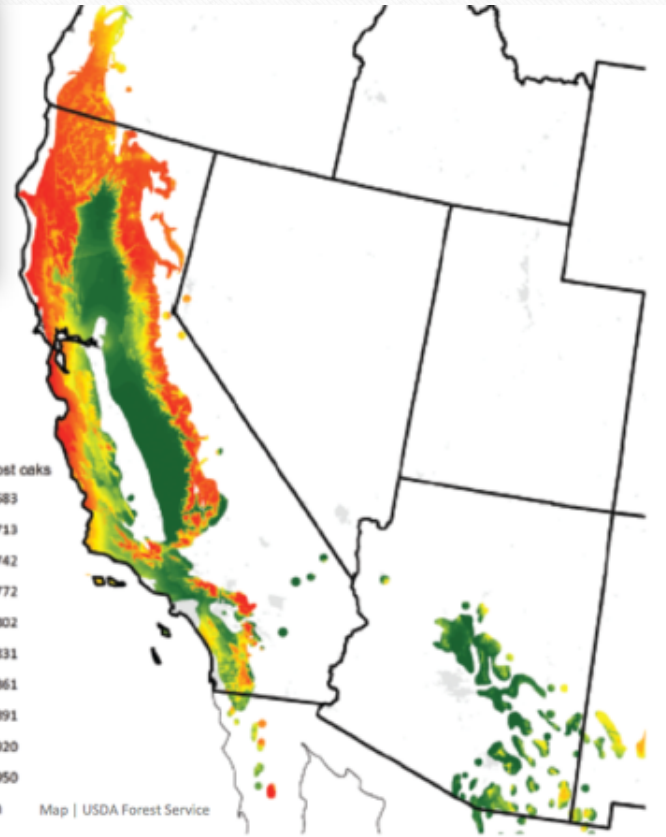
➤ Prepupae cold tolerance of about -0.4°F



Climate suitability (0-1000) within distribution of host oaks



Map | USDA Forest Service



Invasive Shot Hole Borers

- Polyphagous shot hole borer (PSHB)
 - Vietnam and Israel
 - 1st Identified in Los Angeles Co 2003
- Kuroshio shot hole borer (KSHB)
 - Taiwan and Okinawa
 - 1st Identified in San Diego Co 2014
 - Related to PSHB, genetically distinct
- Hundreds of thousands of trees killed



Internal symptoms on coast live oak

Beetle Characteristics

- Beetles – fungi farmers
 - 5 known fungi species between beetles
- Females are black, 2 mm
- Males are brown, 1.5 mm
- Males don't leave tree
- Females pregnant before leave tree



Male & Female PSHB on Penny

Hosts

- More than 260 known hosts
- At least 35 reproductive hosts
 - 17 native CA species
 - All major riparian tree species
 - Common landscape trees
 - Agricultural species – avocado, black mission fig



Dead box elder tree, Ontario, CA

Distribution

- Polyphagous
- Kuroshio
- Monitoring Traps
- Los Angeles
- Orange
- Riverside
- San Bernardino
- San Diego
- San Luis Obispo
- Santa Barbara
- Ventura

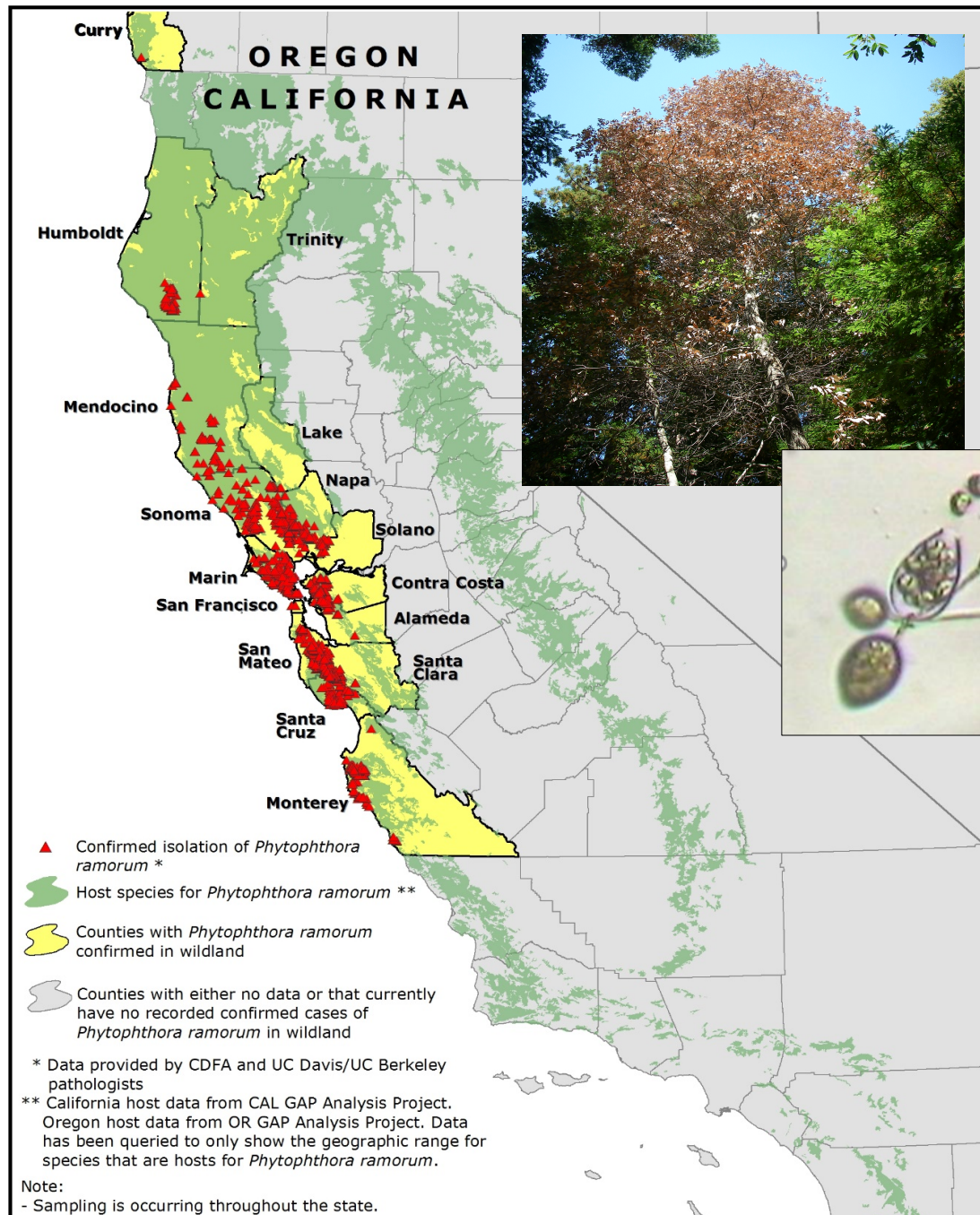


Phytophthora ramorum

- Sudden oak death
 - Trunk infection/mortality: 4 oak hosts, tanoak
- *Ramorum* blight
 - Foliar and twig infection
 - Affects non-oak hosts, including tanoak
- More than 140 hosts
- Millions of trees killed since mid-1990s



Distribution of Sudden Oak Death as of July 8, 2014



- Mild temps, 61-72 F
- Extended rain – 12+ hrs; 2+ years

CA Firewood Regulations

- Firewood is prohibited from entering CA if it originated in any area under quarantine for, or an area generally infested with pests, such as emerald ash borer and gypsy moth.
- *P. ramorum* host material leaving 15 quarantine counties is regulated.
- In S CA counties quarantined for red imported fire ant, it is illegal to move firewood without prior authorization if it has been stored in direct contact with the ground.



Current Program: Border Stations

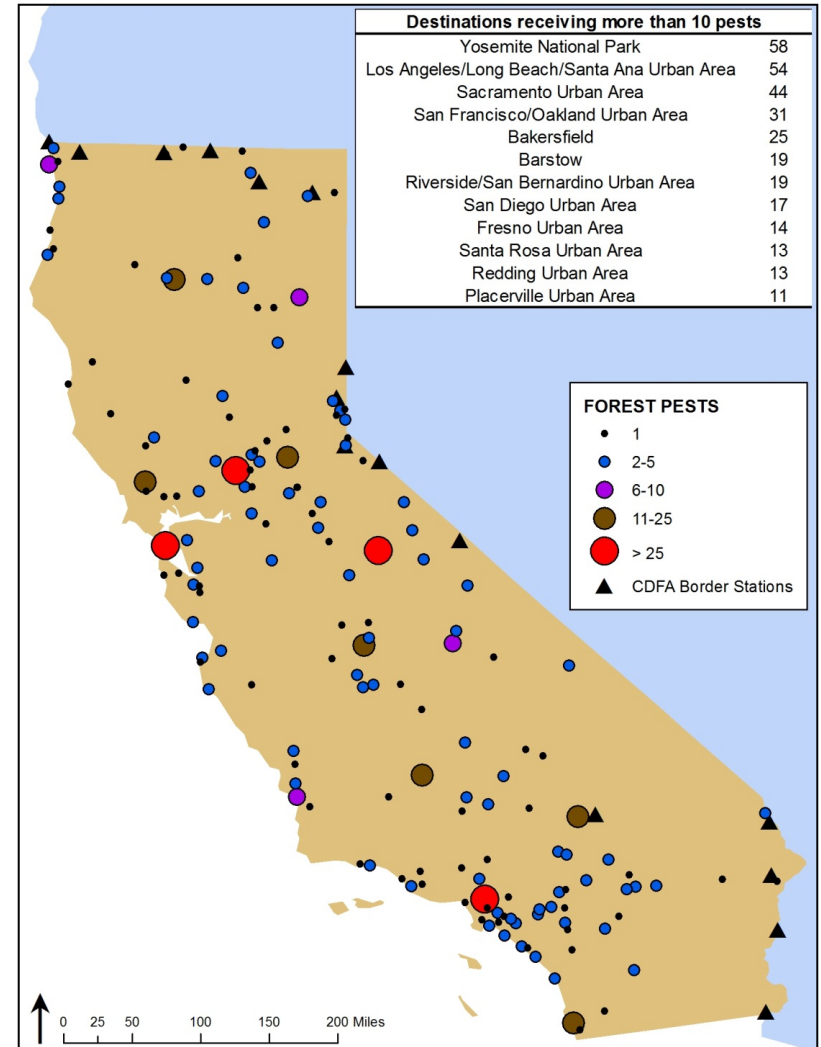
- 16 Stations statewide
 - 9 Fully staffed 24/7 on main routes into CA
 - 7 Smaller stations staffed peak hours
- Inspectors visually assess wood entering the state, split based on pest risk
 - Confiscate infested wood

Firewood and Forest Pests Entering California, 2011-2013

- 2015 USFS report analyzed border station data on firewood and associated forest pests
- Over 67 million pounds of wood entering state
- Wood from 47 states, Canada, and Mexico
- Firewood in private vehicles traveling 76 miles on average

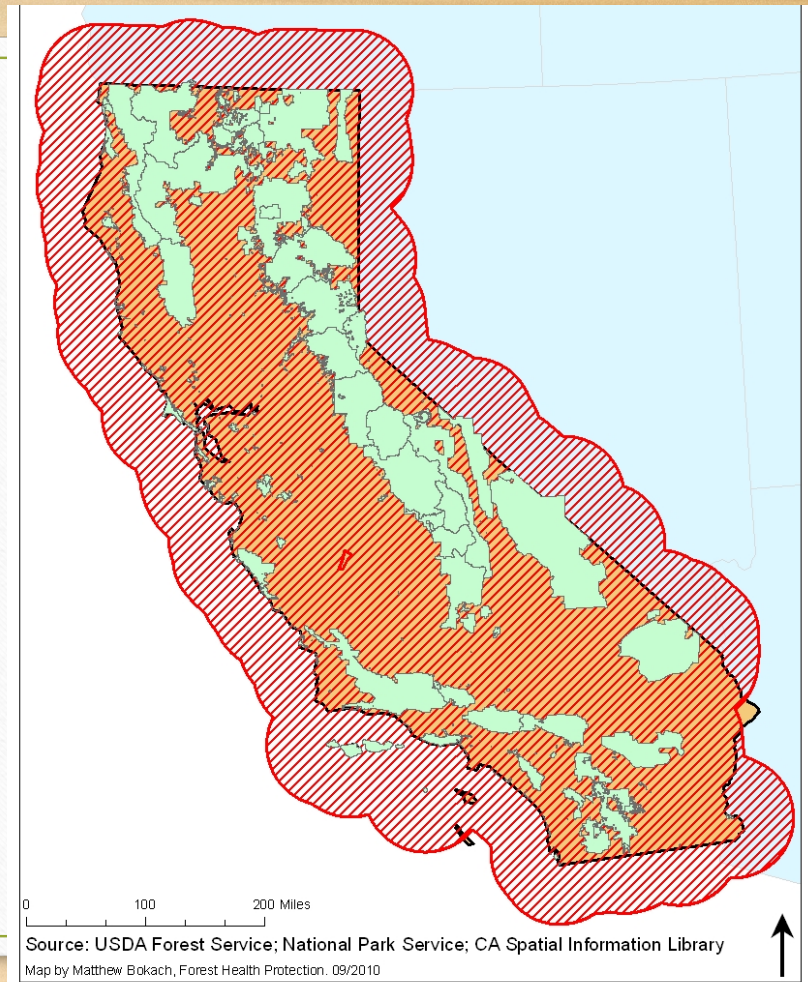
2011 - 2013

- 610 Pests intercepted on firewood
 - 94% were beetles
- Infested firewood bound for over 170 destinations
- Top Destinations
 - Yosemite
 - Most large urban areas



2011 - 2013

- 99.8% of CA is within 50 miles of a National or State Park or Forest
- 76 Miles - avg distance wood travels
- Any forest pest hitchhiking on firewood is a threat to CA parks and forests





Border Stations – Past 5 Years

- 353 Firewood load interceptions of actionable pests
 - 66 with metallic wood-boring beetle (*Buprestidae*, family includes EAB) larvae
 - 287 with longhorn beetles (*Cerambycidae*, family includes ALB) larvae

Sidebar photographs courtesy of CA Dept of Food and Agriculture



US Army Corps
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University of California
Agriculture and Natural Resources



Firewood.ca.gov



HELP STOP THE SPREAD OF INVASIVE PESTS & DISEASES.

Our forests are threatened by nonnative insects and diseases that can kill large numbers of trees. Goldspotted oak borer, sudden oak death, pitch canker, emerald ash borer, and Asian longhorned beetle can be transported long distances on firewood. Once transported to new areas, these insects and diseases can become established and kill trees.

HOW YOU CAN HELP:

- Leave firewood at home – buy or collect firewood where you camp.
- Use firewood in the same county or region where it was cut.
- Bring only what you'll need, and burn responsibly.

BUY IT WHERE YOU BURN IT.



firewood.ca.gov

**DONTMOVE
FIREWOOD.org**



PROTECT CALIFORNIA TREES



California forests are threatened by nonnative insects and diseases. These invasive species can spread to new areas on firewood, where they can kill large numbers of trees.

You can help!

- Buy or collect firewood from a source near where it will be used.
- Don't take firewood home from a trip.
- Find local firewood vendors at firewoodscout.org.
- Only obtain as much wood as you will need, and burn responsibly.

BUY IT WHERE YOU BURN IT.



firewood.ca.gov

**DONTMOVE
FIREWOOD.org**





FIREWOOD SCOUT

Buy it where you burn it!

Help protect California's forests.
You can make a difference.
Find local firewood at :



firewoodscout.org

Do you use firewood at home or for camping?

Buying local firewood isn't just good for the economy, it also helps protect nearby forests from the spread of pests and diseases. Visit firewoodscout.org to find local vendors and to learn about safe wood practices.

Are you a firewood producer or vendor?

To help customers find you, add your business to Firewood Scout at firewoodscout.org/contact.

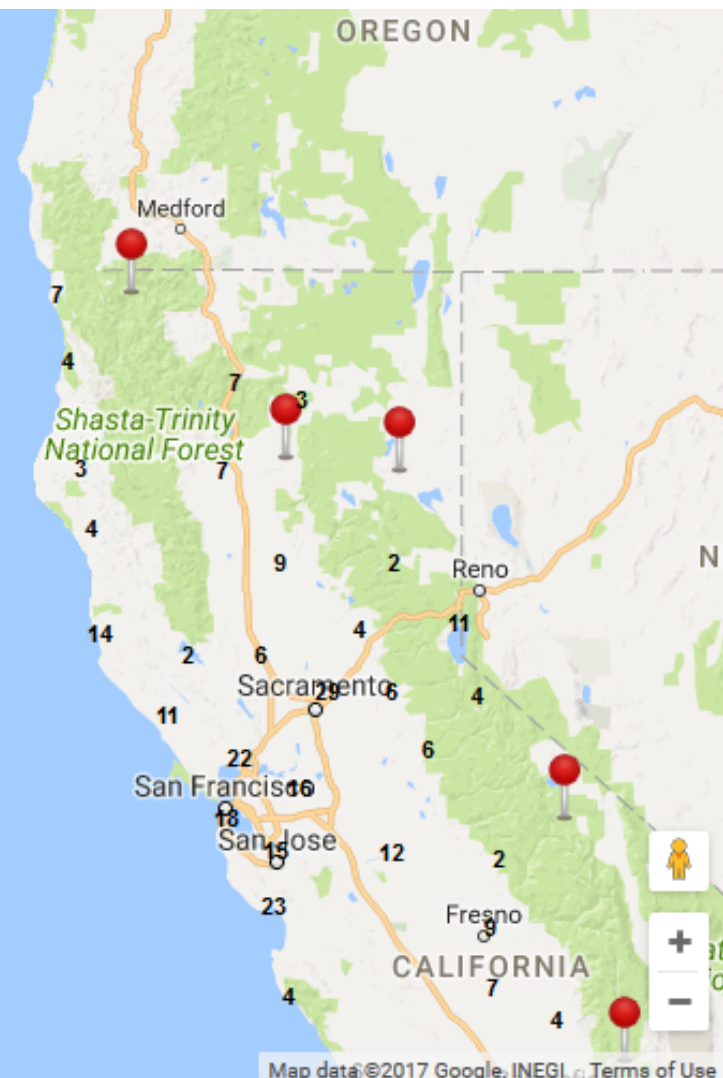
In partnership with:



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PLACE
POSTAGE
HERE



Other Outreach

- Website
- Direct communication with state and national parks and forests, campground managers
- Magazine ads – campers, 4-wheel drive, sportsmen
- Press releases
- Public service announcements



Barriers to Regulations

- Funding limitations
- Quarantines have to apply to all host material, including woody ornamental nursery stock, firewood, and green waste to ensure all potential pathways are addressed



Barriers to Regulations

- Lack adequate trapping for some pests, such as SHBs
- Need statewide delimitation surveys to regulate a pest/associated firewood
- Host range should be known/relatively stable
- Need plan for confiscated infested firewood and funding to support it
- Need more local options for disposal and utilization of infested wood throughout the state



Looking Forward



➤ Multi-agency group

- Team approach – new and existing invasives – prevention/response
- Bring the strengths of each agency to table
- Look for funding opportunities
- Develop risk matrix to determine when to act
- Engage APHIS to impact issues categorized as non-actionable before deemed non-actionable
- Better engage political delegates to elevate issues

- Research - effective traps, control, eradication
- Ongoing pest surveys
- Improve disposal and utilization options
- Increase availability of local firewood
- Continue education and outreach, including citizen scientists





Thank You

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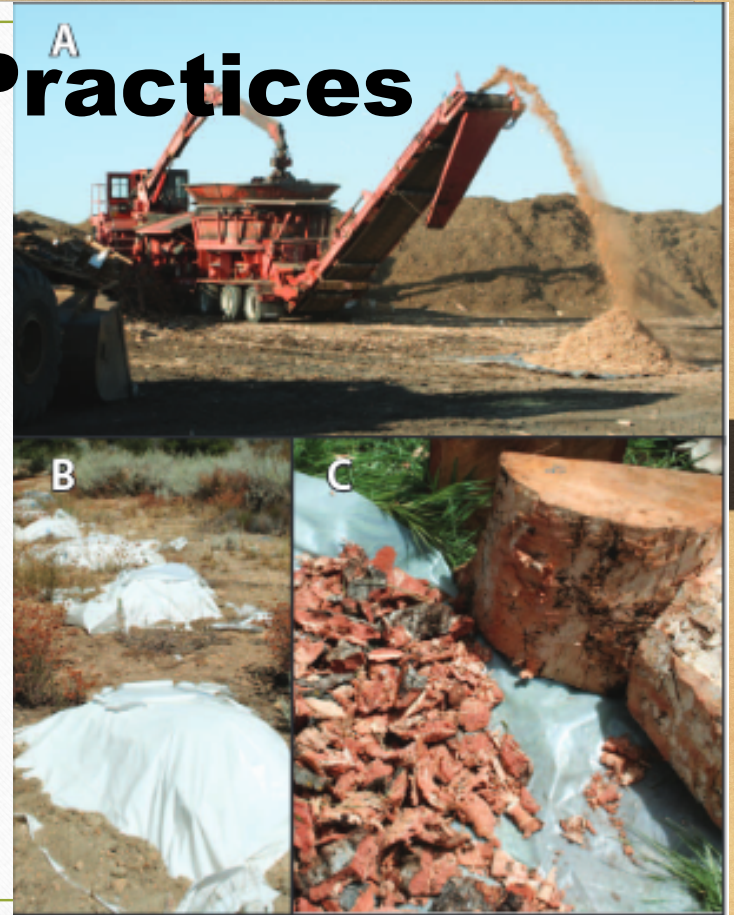
Best Management Practices

- Grind infested wood
- Solarize wood with clear, UV-resistant plastic
 - Sunny location
 - Tarp edges buried in soil
 - Adults will be trapped and eventually die
- Debark wood prior to emergence of adult
 - Destroy or tarp bark material
- Dry wood for 2 years if **MUST** move it



Best Management Practices

- Grind infested wood
- Solarize wood with clear, UV-resistant plastic
 - Sunny location
 - Tarp edges buried in soil
- Sterilize pruning tools between uses to avoid spreading the fungus



Quarantine County Best Management Practices

