Sudden Oak Death Update for Foresters and Landowners

Eureka, California

May 13, 2010

The Latest in the SOD Regulatory World

Mark Stanley
Chair, California Oak Mortality Task Force
Chief Deputy Director CDF (Retired)

California Oak
Mortality Task Force

Regulations 101

State vs. federal regulations

Quarantined counties

Bole hosts vs. foliar hosts

Movement inside the 14 counties

Movement outside the 14 counties

California Oak Mortality Task Force

Federal vs. State

Federal Regulation - USDA Agricultural and Plant Health Inspection Service (APHIS)

California Department of Food and Agriculture (CDFA)

They are "Harmonized"

Both enforced by Ag Commissioner

Regulations Say

Regulated material cannot move outside of the quarantined area without some action.

- This could be an inspection
- Free from protocol
- Mitigation or treatment

Purpose is to not have this disease/pathogen move through human means

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Bole vs Foliar Hosts

Bole cankers on coast live oak, Shreve's oak, tanoak, black oak, do not sporulate and therefore do not present a risk for spreading the infection, but they are still regulated.

Foliar hosts such as bay, madrone, huckleberry, poison oak, tanoak, yew, salmonberry, … are the inoculum source for this disease to infect the trees.

Redwood, Douglas fir, grand fir, are confirmed foliar hosts but only needles and twigs <1" are regulated for these… for now.

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Bole vs Foliar Hosts

Inspections

Mainly pertains to nursery products but may include other products:

burls, wreaths, spices, greens, xmas trees

Seeds are not regulated.

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"Free From" Protocol

Currently done in and around nurseries in quarantined counties' "Pest Free Zone".

Currently available in forests for movement within the state.

Proposed to APHIS for those counties that are not generally infested. (Still waiting for action from APHIS).

Treatment

Different for different products

- Wreaths - boiling or vacuum treatment
- Tanoak, debarking, kiln drying, fumigation …
- Other bole hosts – debarking

Movement will require some kind of phytosanitary certificate so the receiving party is assured that there is no risk of spread.

Specific Products

Redwood and Douglas fir, grand fir, logs:

Logs are not regulated but they must be free of leaves, needles and twigs if leaving the 14 counties.

Tanoak - The whole tree is regulated and must be debarked to move or have some other mitigation, depending on destination.

Douglas fir and redwood cones

The seeds and cones are not regulated but as with logs, needles must be removed to ship out of regulated area.

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Specific Products

Christmas trees - Douglas fir, grand fir, red fir….
Treated as nursery stock and farm is inspected prior to season.

Df boughs for wreaths are regulated as a product and have to be inspected.

Lilly bulbs -the bulbs are not regulated but the soil they are growing in is. This would require an inspection and removal of all soil.

The bottom line is that a regulated host has to be treated or mitigated and inspected in order to move out of the 14 counties.

What Is on the Horizon

Douglas fir, western hemlock, Port Orford cedar have been found as bole hosts in the UK.

In the past these would have been put on the host list by APHIS, but that has not happened yet.

Could have significant impact on the timber industry on the west coast

Debarking at a minimum, manufacturing in the 14 county area only, and potentially kiln drying

Stay Tuned @

www.suddenoakdeath.org

California Oak

Mortality Task Force

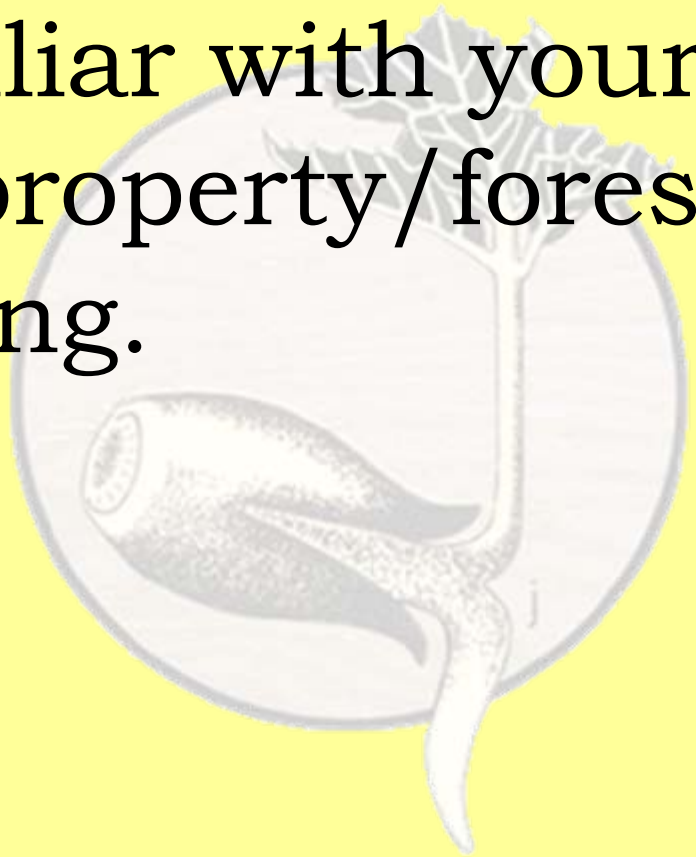
SOD and Forestry

Jack Marshall

May 12th and 13th, 2010

Some first steps

- Be familiar with your property, or the property/forest you are managing.



Do I have **SOD** on my property, or within my timber harvest plan area?

- Must know on which plants to look
  - Find host lists at www.suddenoakdeath.org
    - Look under **Symptoms and Diagnosis**
      - Host Plant Lists (February 2010)

Do I have **SOD** on my property, or within my timber harvest plan area?

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- Learn symptoms on those hosts
  - Look under **Symptoms and Diagnosis**
    - **Plant Symptoms** (first 3 are oak, tanoak, bay. Learn these.)
      - » **Image Library**
      - » **Plant Symptoms photos** (for other hosts)

Now that I know what symptoms to look for, and on which hosts, how do I survey for incidence of the disease?

- www.suddenoakdeath.org
  - **Treatment and Management**
    - **Professional Resources**
      - **Survey Methods (handout)**
        - Delineation grid – stip cruise 20%
        - Characterization Survey (variable %) for % infected, % mortality, ave. age, ave. size, etc.

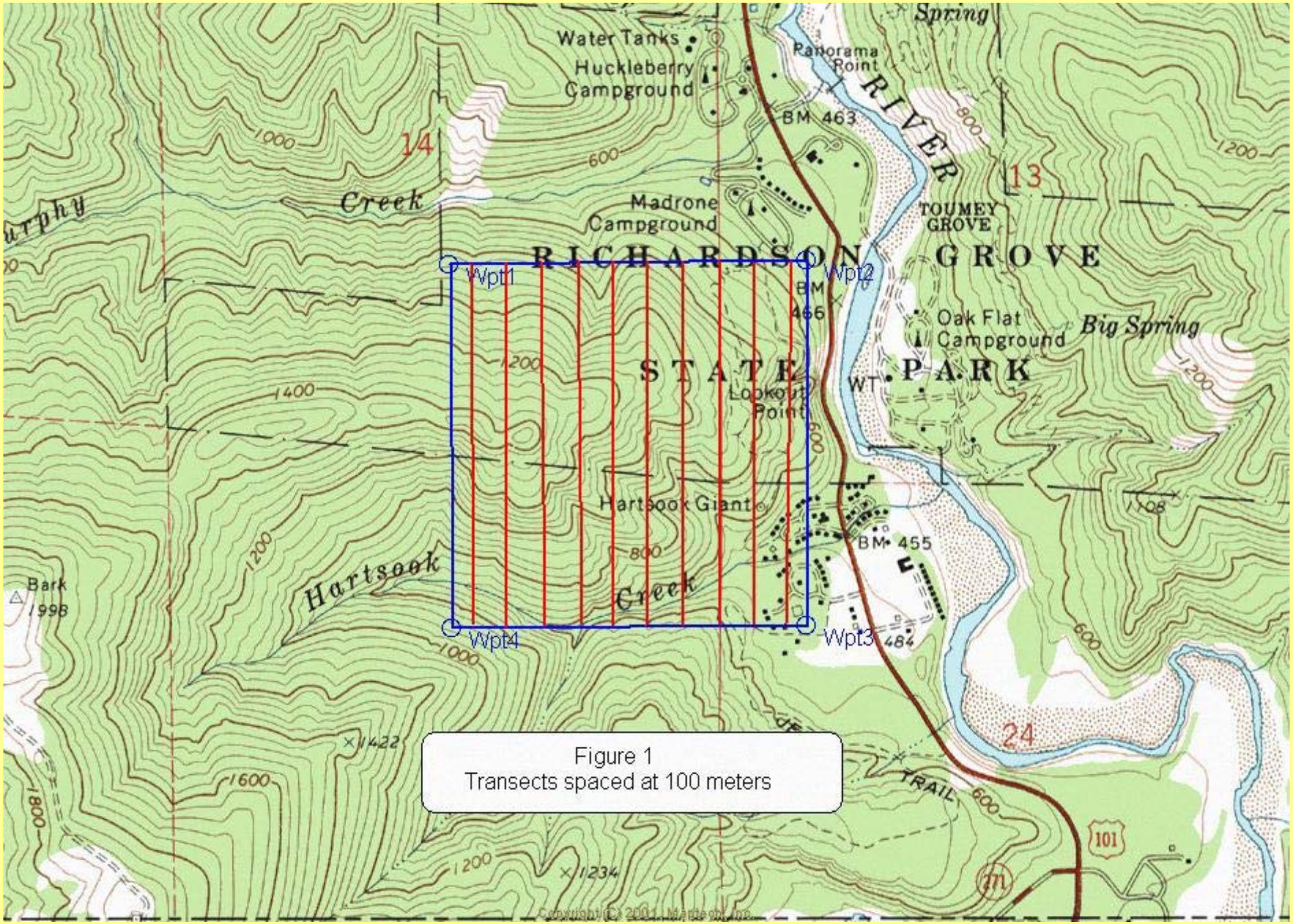


Figure 1
Transects spaced at 100 meters

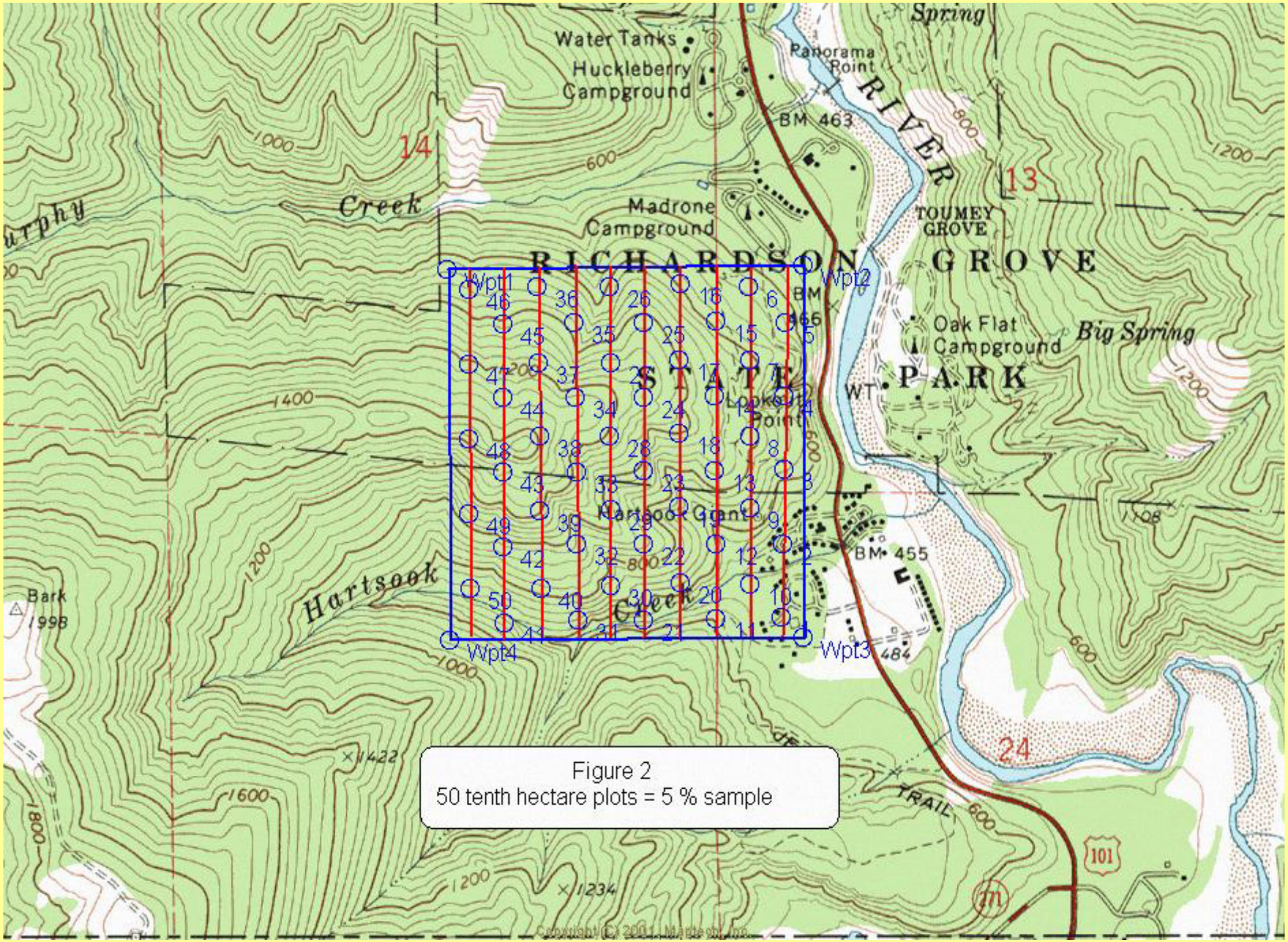


Figure 2
50 tenth hectare plots = 5 % sample

You've heard Mark talk about regulations (stuff you gotta do) if the regulated article leaves the quarantine area (ZOI) or state. But what can you do to minimize the risk of introduction or spread within the quarantine area /ZOI (stuff you should consider doing)?

SOD
Best Management Practices

a.k.a.
stuff you oughtta be doin’

BMP Basics

- **Based on the biology of the pathogen**
- **Conditions it thrives in**
- **Actions that can be done by humans with some likelihood of success**

Elements for Effective BMP's

- **Knowledge** of the pathogen
- **Planning** to mitigate spread
- **Sanitation**
- **Timing** of activity
- **Avoidance** of the pathogen
- **Accepted Treatments**
- **Monitoring** for effectiveness

Knowledge

- ***P.r.*** **likes it warm & wet (spring)**
- ***P.r.*** **does NOT like hot & dry**
- ***P.r.*** **can survive in green plant material, soil, and water**
- ***P.r.*** **can move from Point A to Point B in plant material, soil, and water**
- **Stem-infected trees may be structurally weak and hazardous**

Planning

- Survey & sample for SOD
- Know where equipment is coming from, or going to next
- Know where to get regulatory paperwork, and who to contact
- Sanitation plan - put together sanitation kits and plan sanitation site
- Tailgate sessions to explain SOD mitigation
- Plant ID training
- Know location of nearest power wash
- Green waste disposal
- Location of logging decks, landings, roads, etc.

Wash Station

Eel River Camp


Redway


DEERE
80C

Sanitation

- **Kits: Lysol or bleach, water, brushes, whisk broom, Muck-type rubber boots, tool to clean shoe tread, towels, bucket, plastic gloves, bags/baggies, & tarp**
- **What to clean: shoes, hand & heavy equipment, vehicles, rec. vehicles, pets, gloves OR,**
- **Dedicate sets of equipment, shoes, and gloves for use only in SOD areas. Keep bagged and identified.**


Vermeer 125
IMPORTANT
CALIFORNIA
902838

10% bleach solution


CCC
CCC
CCC


CCC
CCC
CCC


OHIO PRISONER

Timing

- **Work in disease free areas when wet, cool, and muddy**
- **Save SOD areas for hot, dry time, usually June through October**
- **Monitor and sample during wet, cool periods (late winter – early spring)**
- ***** Note - Infected bay leaves may be cast after hot summer periods**

Avoid

- Muddy areas where SOD exists
- Parking off-road, or rock a planned parking area
- Drafting water from infected drainages, and using elsewhere
- Grinding stumps to, or below, soil line

- **--- Wait, there's more…**

More things to avoid

- Placing chip or firewood piles in areas where others have access to move product - Keep firewood local
- Creating a fire hazard or other problems when abating SOD area
- Cankered trees for long-term snag recruitment

Accepted Treatments

- Stand manipulations (host reductions)
- Chemical treatments (Agri-fos, sprout mitigating herbicides)
- Composting, chipping, or pile & burn
- Bay leaves: vacuum/heat for spice, free-from survey or out-of-county gathering and compliance agreement for wreaths
- Genetic resistance is being evaluated
- Top dress exposed soil and trails with chips from Alaska yellow cedar heartwood or non-hosts
- Restoration

Humboldt Co.


Humboldt Co.

Monitor

- Survey & sample yearly
- Leaf-bait watercourses
- Rain bucket spore load quantification
- Soil sampling
- Check bay trees as early indicator
- Monitor tanoak sprouts
- Evaluate treatments

Incorporating SOD into land/resource management plans or timber harvest documents

- Follow all applicable state and federal regulations
- Obtain appropriate Compliance Agreements
- Incorporate BMPs to:
  - Minimize risk of disease introduction into property
  - Minimize build-up of disease within property
  - Minimize spread to other properties

Specific to state and private timber harvest plans (1 of 3)

- Determine location of SOD outbreaks and report to the Director. **14 CCR 917.10** [All Districts].
- Since the Board of Forestry and Fire Protection has approved the Director's declaration for the need of a Zone of Infestation, an increased awareness and knowledge level of that pest is expected from the professional forester prescribing management practices within that ZOI.
- **14 CCR 917.9** (a) [All Districts] mandates mitigations for pests when plan is within a ZOI

Specific to state and private timber harvest plans (2 of 3)

- Just saying the regulated articles will not be leaving the ZOI, and therefore no state or federal regulations apply, is **NOT** showing how the proposed timber operations will minimize the build-up (including introduction) or spread of the disease (within the ZOI). Reference **14 CCR 917.9** [All Districts].
- Review and Consider the list of Best Management Practices we just reviewed, or explain how other mitigations will accomplish **14 CCR 917.9** [All Districts].

Specific to state and private timber harvest plans (3 of 3)

- Or, provide a “Free-From” survey report.
  - Must have certified surveyor from a previous COMTF training class
  - Include survey methods and survey map
  - Include sampling results
  - “Free-From” provides reasonable assurance that SOD is not on-site, but you still need to provide mitigation minimizing the risk of introduction
  - Not valid if regulated articles are to leave the state

For THPs filed under an approved **S**ustained **Y**ield **P**lan

- Review SOD information and identify new issues or mitigations in the new THP or deviation (substantial or minor). **14 CCR 1091.14**

Approved THP is the functional equivalency of a Compliance Agreement

- Must be with load, just as with a regular Compliance Agreement
- Compliance Agreement or Equivalency good for one year:
  - From date of completion of “free-from” survey if no symptoms were detected
  - From “free-from” survey’s sampling results date obtained from an approved lab
  - From date of approved THP if no survey was conducted and all hosts are deemed infected. Plan’s mitigations must be reviewed and approved.
  - From date of SOD submission letter or amendment to NTMP coinciding with Notice of Timber Operations. Notice must comply with **PRC 4594.6**, that the NTMP is still in conformance with the rules.

  - **And also….**

After 12 months has elapsed …

- Conduct another free-from survey and amend the plan
- Review current state and federal regulations or changes in host lists
- Amend plan where needed or notify Region that there have been no such changes

Forestry Assistance Programs

- California Forest Improvement Program (**CFIP**)
  - 20-to-5,000 acres of forestland zoned timber production (TPZ) or Agriculture Preserve
  - Cost share up to 75%
  - SOD incidence may generate cost share up to 90%
  - Assistance is in the form of reimbursement of invoices, and covers:
    - Plan preparation
    - Site preparation
    - Tree planting
    - Thinning/release

Sudden Oak Death Mortality and Fire: Facts and Speculations

UC Cooperative Extension
Eureka, California
With help from:
Humboldt State University Department of Forestry and Wildland Resources
California Department of Forestry and Fire Protection
USDA Forest Service PSW Research Station

Photo courtesy of British Columbia Ministry of Forests and Range


08/09/2006
Marin County,
2006

What has been observed?

Sudden Oak Death Mortality and Fire

Lessons from the Basin Complex

Chris Lee and Yana Valachovic
University of California Cooperative Extension, Eureka, California; yvala@ucdavis.edu

Susan Frankel
USDA Forest Service, Pacific Southwest Research Station, Albany, California

Katie Palmieri
UC Berkeley and California Oak Mortality Task Force, Berkeley, California

Introduction

The exotic plant pathogen *Phytophthora ramorum*, cause of a disease called Sudden Oak Death, has killed hundreds of thousands of tanoak, coast live oak, California black oak, and canyon live oak trees along the California coast. Hardwood fuels are increasing in these coastal forests, prompting a need to know whether this mortality changes fire behavior, alters the fire ecology of coastal forests, or makes fires more challenging to suppress. The 2008 Basin Complex of fires and Chalk Fire in Big Sur, an area with substantial hardwood mortality because of Sudden Oak Death, offered a chance for fire suppression professionals and fire behavior analysts to make preliminary observations about these issues. We captured those observations in a series of interviews and meetings.

Methods

We used an interview-driven approach to consolidate the available anecdotal information about fire behavior and fire suppression operations on the Basin Complex and Chalk Fire. First, we administered an interview to a core group of Incident Management Team (IMT) personnel. Second, we convened a series of three web meetings with a variety of firefighting administrators, ecologists, and land managers, to bring some of the issues raised by survey respondents under the lens of scientific knowledge and gather together a concise set of recommendations for policy, education, and operational recommendations related to fire and Sudden Oak Death.

Our survey addressed the following general topic areas:

Fire Behavior	Fire Operations
General changes in fire behavior*	Maintaining fire lines**
Spotting**	Hazard trees/safety challenges***
Rates of spread	Hot spots**
Flame lengths**	Mop-up***
Energy release	Demobilization process/sanitation*
Residence time	Water cleanliness
Difficulty in predicting fire behavior*	Future research needs
Future research needs	

* Indicates areas where many interviewees indicated that conditions on the Basin Complex (infested area) were significantly different from conditions in uninfested areas. * = least change, *** = most change.

Results

Most personnel who worked on the Basin Complex perceived that *P. ramorum*-caused mortality increased surface fuel loading. Dead hardwood material was arranged in "jackpots," (patchy distribution). When the flame front reached one of these jackpots, surface fire behavior changed. Most of the measures recommended by IMT members to improve fire suppression operations in these areas involve information sharing.

Safety

The hazard of falling snags is by far the most important issue

Fire Behavior

Some respondents estimated the change in fire behavior overall to be a 20-25% increase

Flame Lengths

Flame lengths increased greatly when a moving fire front reached an area of heavy hardwood mortality

Greater flame lengths = no direct attack = retreat + back burn = a need for diplomacy

Fuel Models

"Slash"-type fuel models (i.e., 11 or 12 in the Anderson (1982) fuel model system) were used to predict fire behavior on the Basin Complex and worked reasonably well. Good information for live fuel moistures and amount of live ground fuel (i.e., herbs and shrubs) present could be used to refine these models

Spotting

Although no crown fire activity was observed, spotting increased (greater distance, greater quantity)

Maps

Having good maps would be helpful for overall tactical decisions and for firefighters who are navigating unknown terrain and need to know specific mortality areas

These maps need to be very localized in scale and can be based on hardwood mortality in general rather than Sudden Oak Death in particular. Maps can be posted on FRAP web site (CAL FIRE) and various other sites

Communication

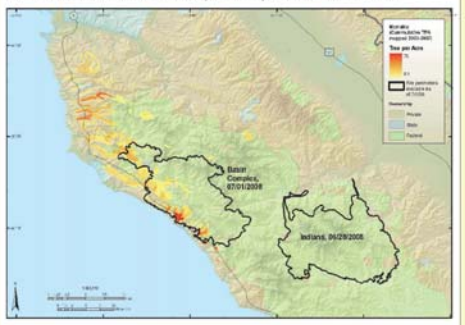
Communication of important information related to fire behavior prediction happens well within jurisdictions (i.e., USFS, CAL FIRE), but not as well between them

Discussion

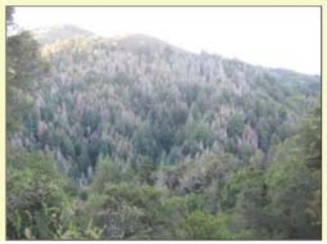
Not everyone who worked on this complex of fires saw them the same way. In general, firefighters who were local to the fires expressed more concern about increased fire behavior than non-local firefighters. According to local fire professionals, funding for local fuels reduction projects is greatly needed. Individual land managers should highly prioritize fuels management and should be actively working to raise funds and write firesafe plans.

Many obstacles to both quick fuels reduction and Sudden Oak Death management remain, not just in Big Sur, but also up and down the California coast. These include funding availability, regulatory constraints (often driven by single-species management), and a spectrum of constantly varying public opinion.

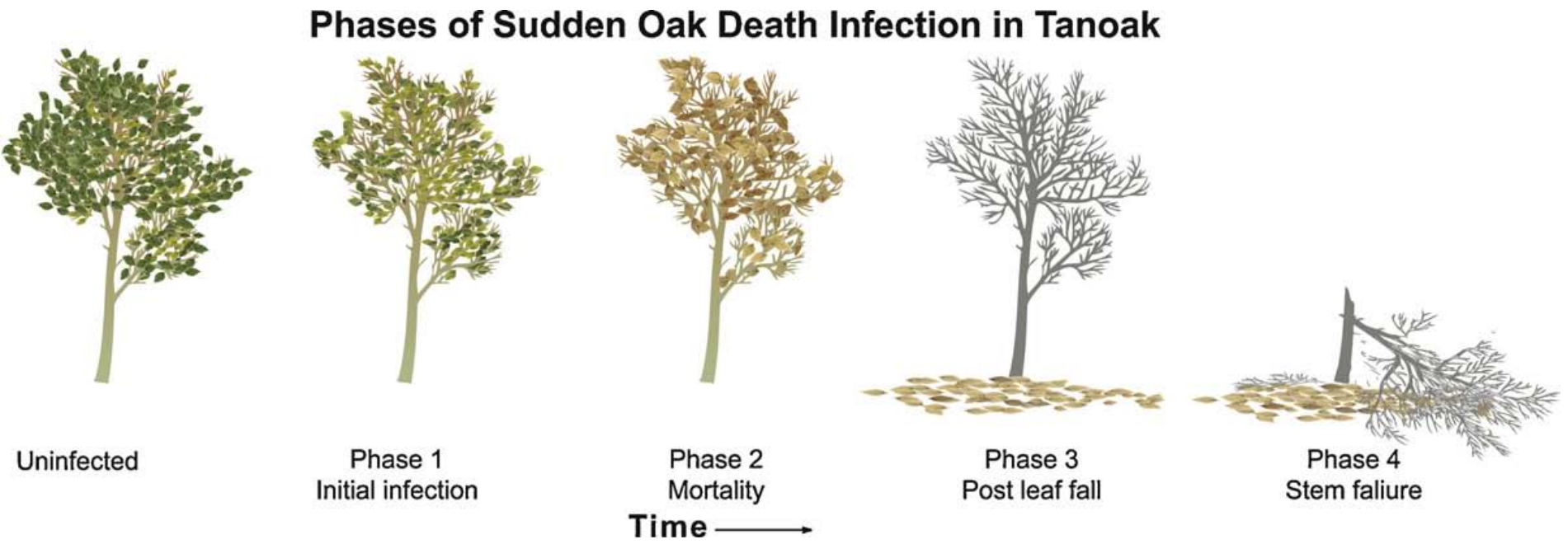
2003-2007 Cumulative Tree Mortality, Monterey Co. with Fire Perimeters



Above: An example map of hardwood mortality in the Big Sur area. *Map by Zack Heath, USFS, State and Private Forestry, Forest Health Monitoring.* Below, from left to right: Hardwood mortality in Big Sur; typical surface fuels conditions in a stand infested with *P. ramorum*; one of the Basin Complex fires; an infested stand post-fire. *Photos by Kerri Frangioso, University of California, Davis.*

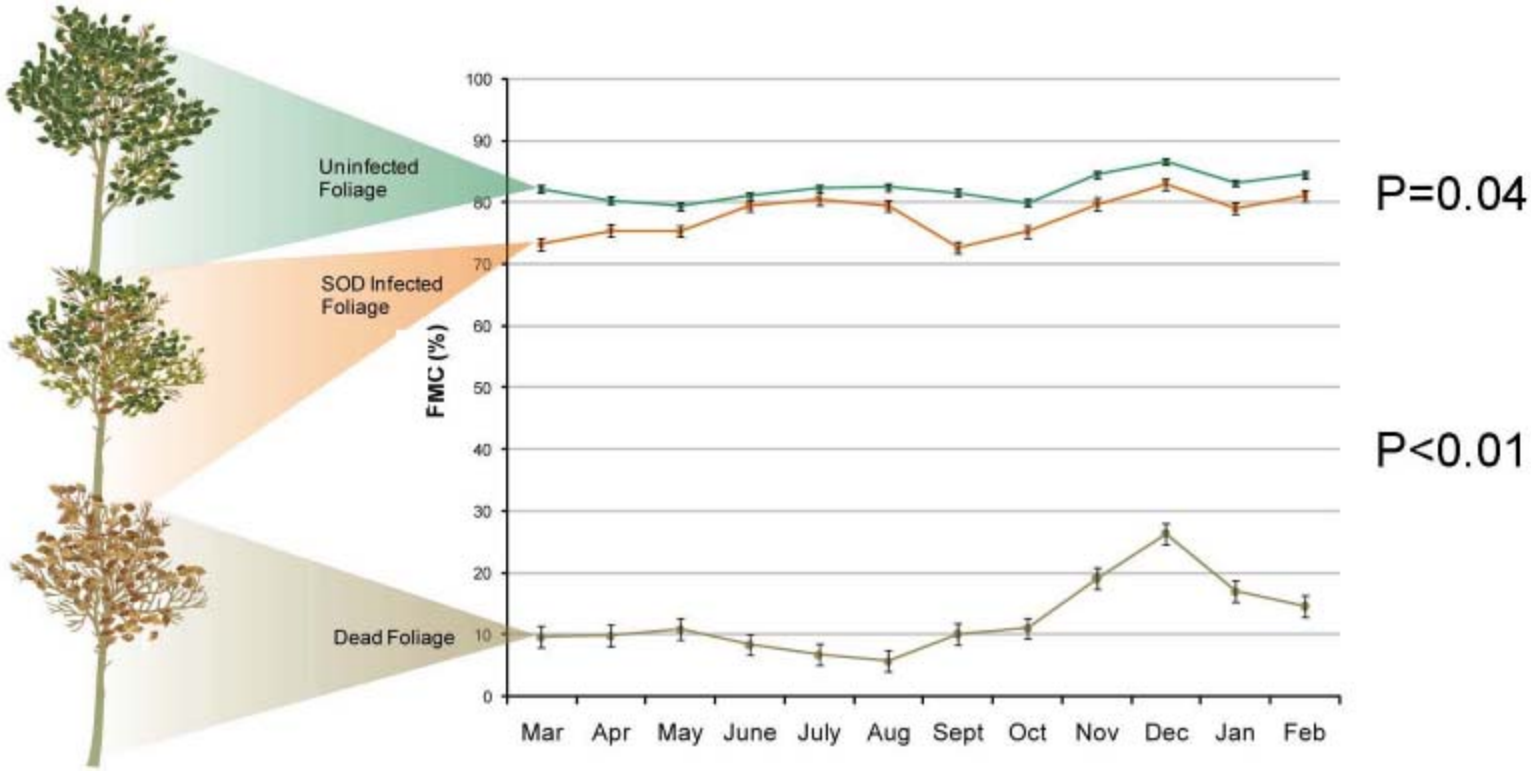


Aerial Fuels



Graphic from Kuljian, H. and Varner, JM. 2010. The effects of sudden oak death on foliar moisture content and crown fire potential in tanoak. Forest Ecology and Management 259: 2103-2110.

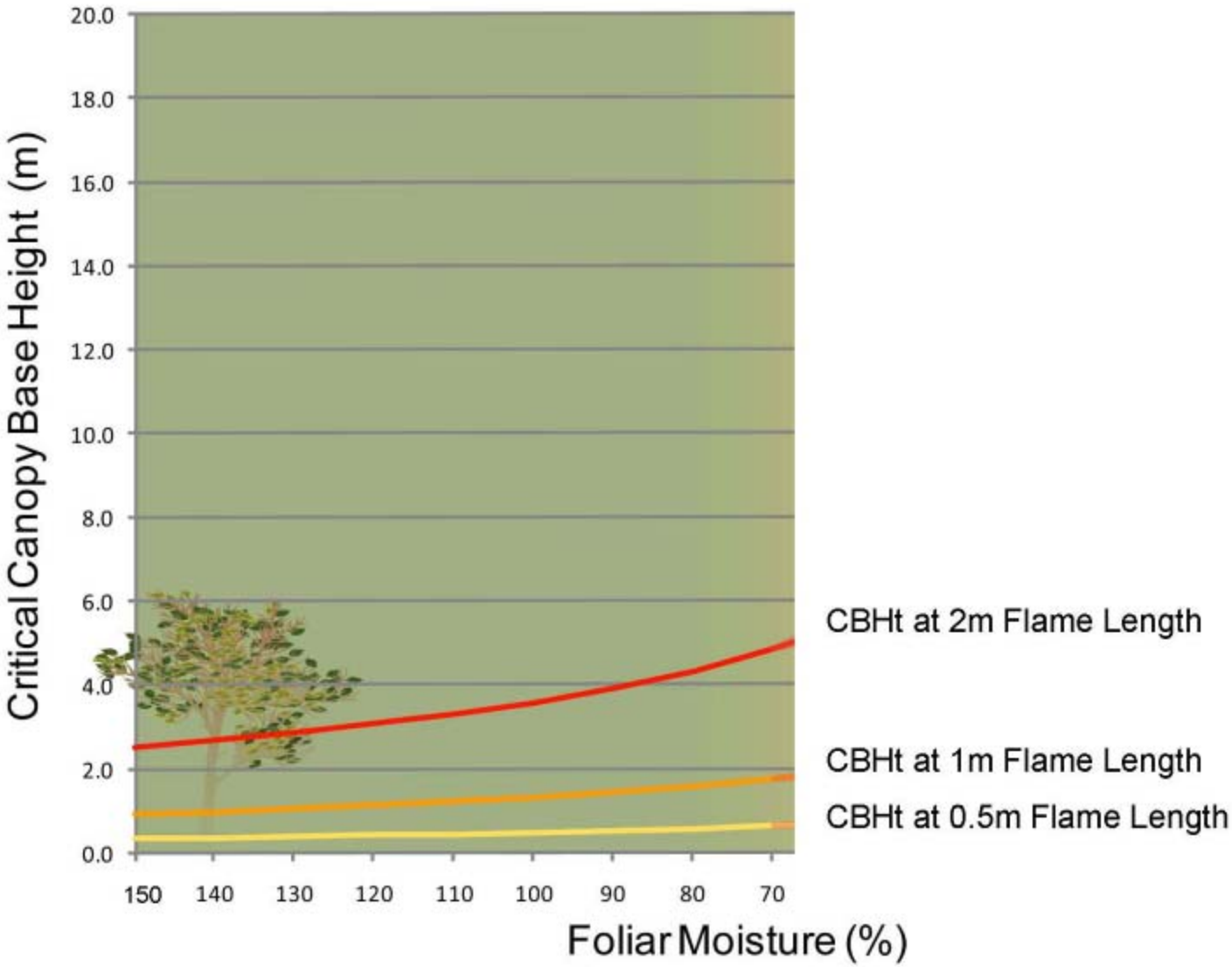
Results:



P=0.04

P<0.01

Minimum canopy base height to resist ignition relative to FMC and surface fire flame length



Spotting

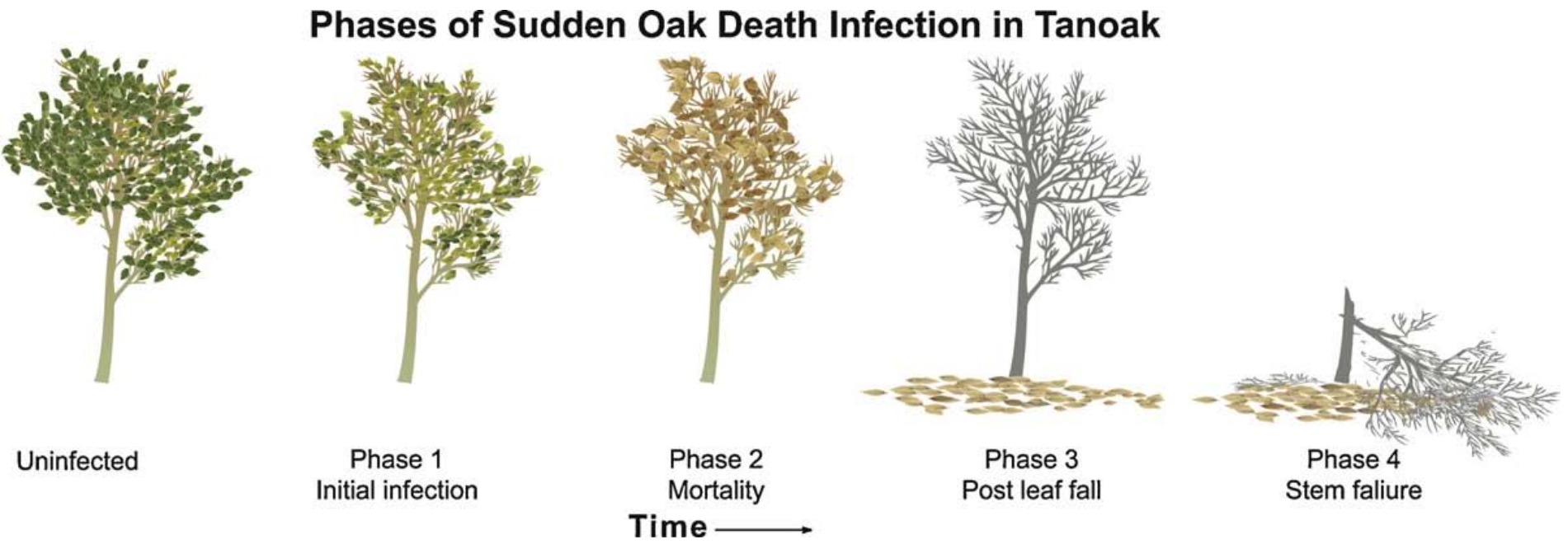
Photos courtesy Kerri Frangioso, UC Davis

Surface Fuels

Photo courtesy Kerri Frangioso, UC Davis

Photo courtesy Howard Kuljian, Humboldt State U.

Photo courtesy Kerri Frangioso, UC Davis



Graphic from Kuljian, H. and Varner, JM. 2010. The effects of sudden oak death on foliar moisture content and crown fire potential in tanoak. Forest Ecology and Management 259: 2103-2110.

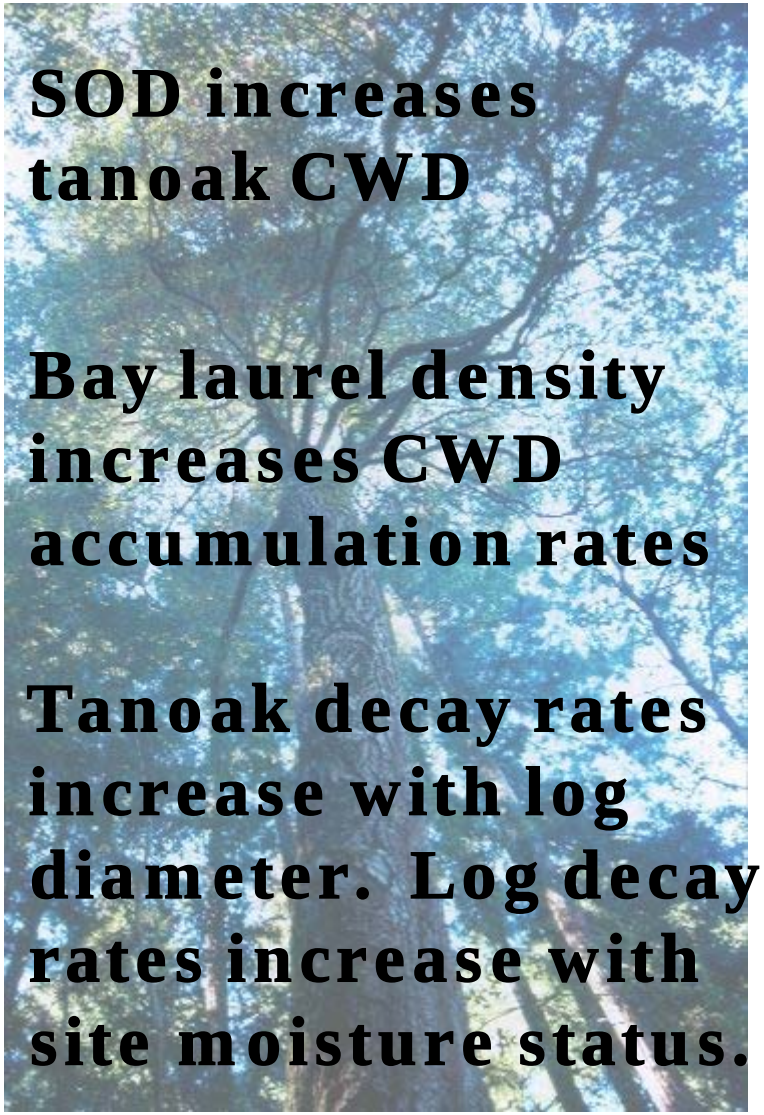
Research Questions:

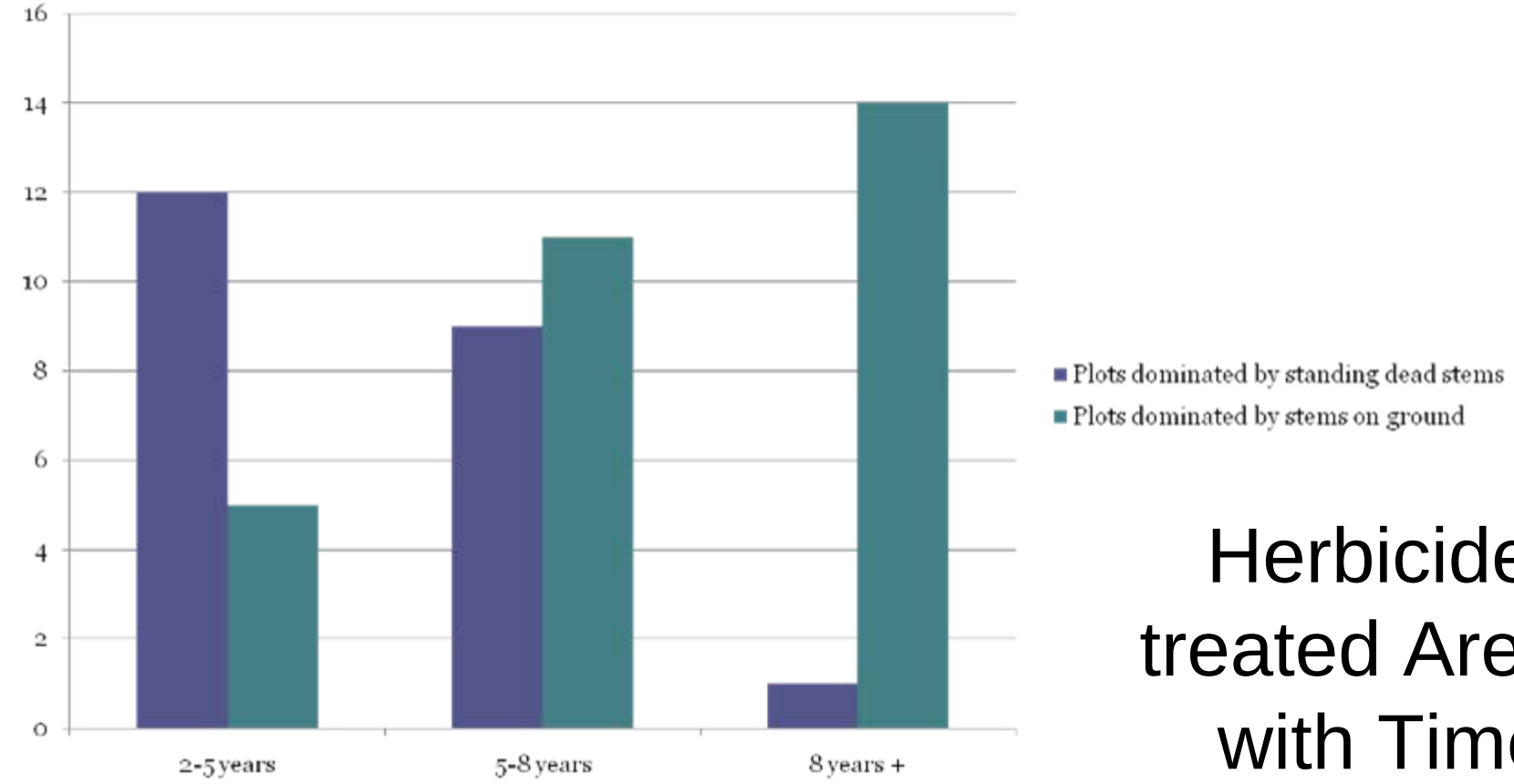
Richard Cobb, UC Davis Rizzo Lab

-Does sudden oak death increase coarse woody debris levels over baseline?

-How does community structure influence CWD accumulation rates?

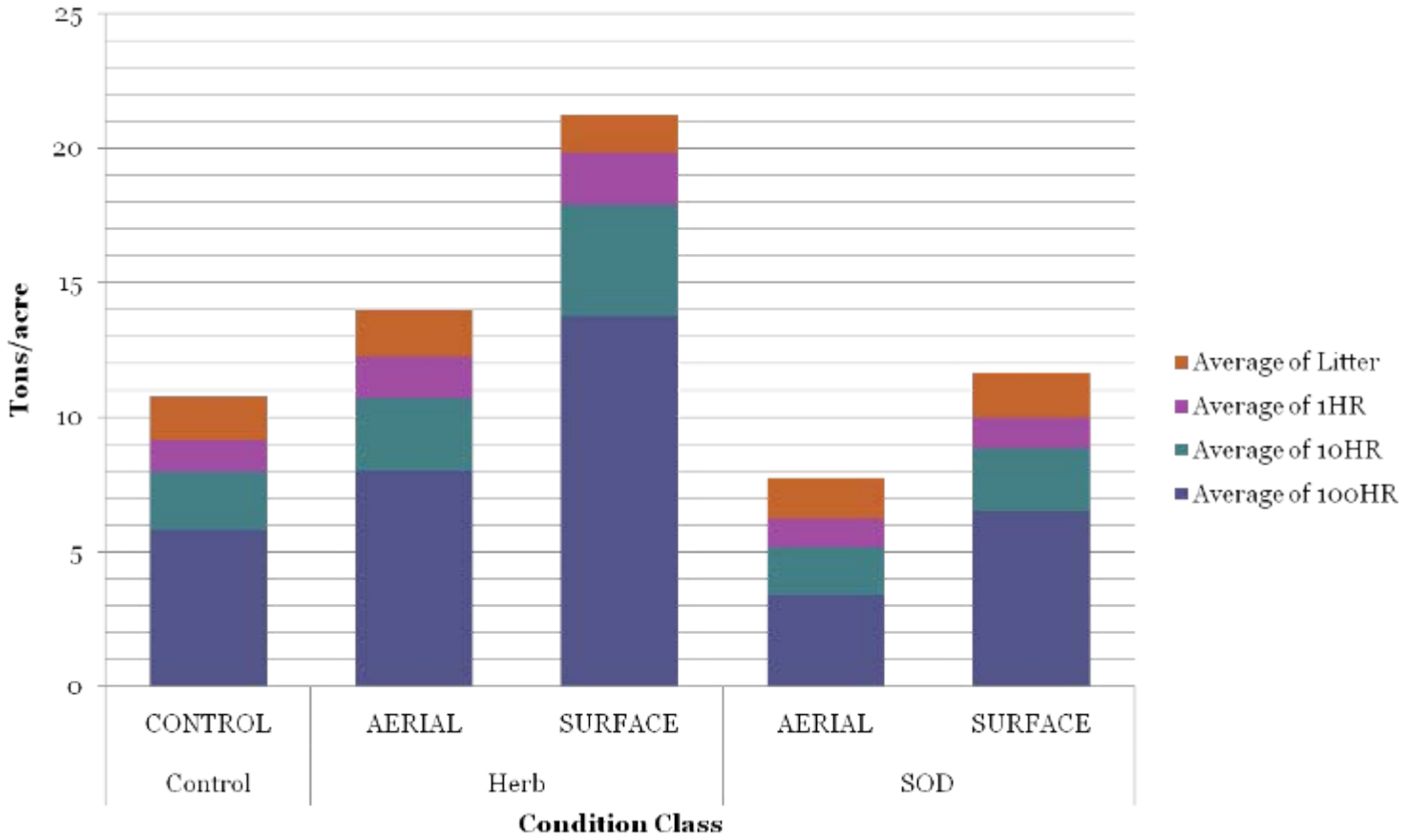
-What are tanoak decay rates in these forests and what factors influence them?

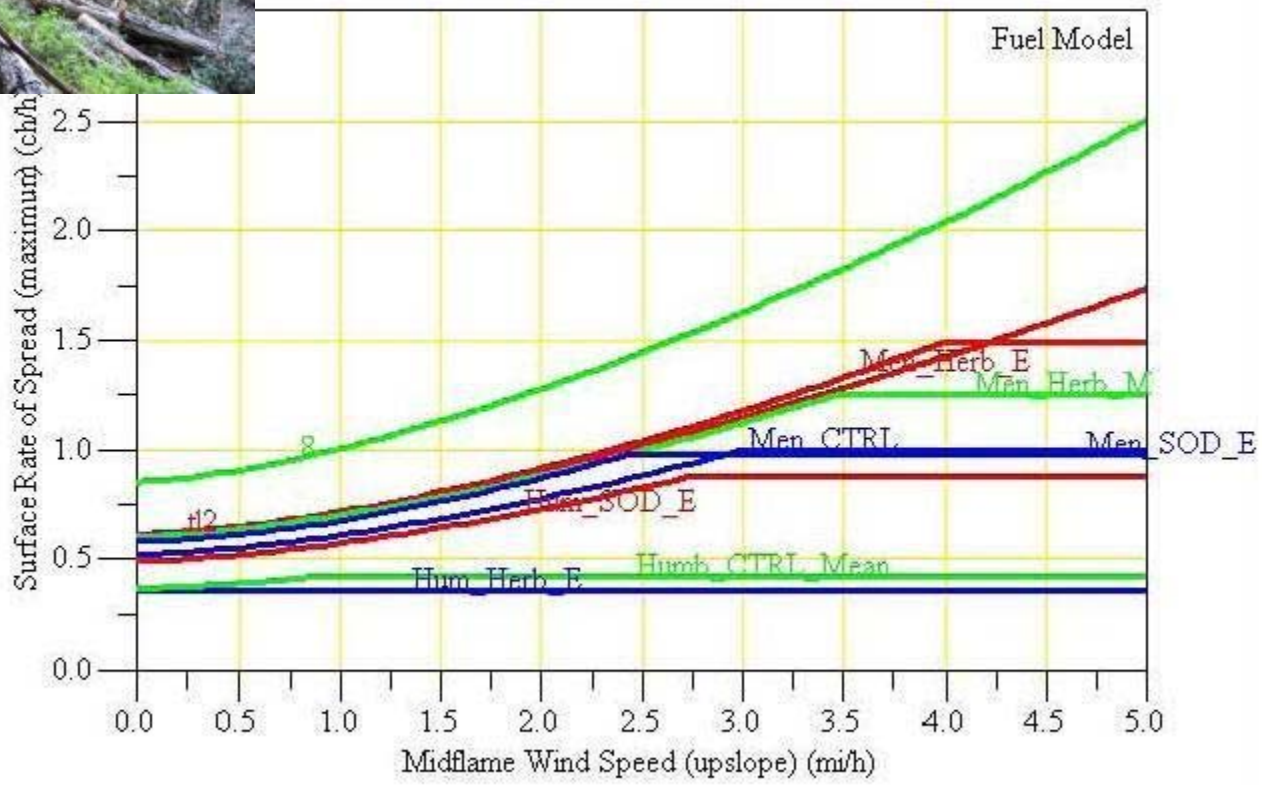




Herbicide-treated Areas, with Time since Treatment

Fuel Loading (tons/ac) by Condition Class




Fuel Model
Surface Rate of Spread (maximum) (ch/h)
2.5
2.0
1.5
1.0
0.5
0.0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
Midflame Wind Speed (upslope) (mi/h)
8
Men_Herb_E
Men_CTRL
Men_SOD_E
Hum_SOD_E
Humb_CTRL_Mean
Hum_Herb_E

Photos courtesy Kerri Frangioso, UC Davis

Acknowledgements

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  Morgan Varner, Humboldt State U.

  Howard Kuljian, Humboldt State U.

  Dave Rizzo, UC Davis

  Richard Cobb, UC Davis

- Participants:

  Chuck Berner, Sierra NF

  Dennis Burns, Livermore-Pleasanton Fire Dept.

  Craig Carter, Graeagle Fire

  Matt Casterman, Mid-Peninsula Open Space District

  John Connors, UC Berkeley

  Les Curtis, Lassen NF

  Steve Davis, Los Padres NF

  Steve Dean, Los Padres NF

  Alison Forrestel, UC Berkeley/Pt Reyes NS

  Kerri Frangioso, UC Davis/Big Sur VFB

  Martin Hamel, Angeles NF

  Sam Marouk, Sierra NF

  Kelly Martin, Yosemite NP

  Jack Marshall, CAL FIRE

  Charley Martin, BLM Medford Dist

  Margaret Metz, UC Davis

  Ellen Natesan, San Francisco PUC

  Cindy Roessler, Mid-Peninsula Open Space District

  Caerleon Safford, FIRESAFE Sonoma/ Sonoma Cty Dept. Emergency Services

  Mark Stanley, COMTF/CAL FIRE

  Stephen Underwood, CA State Parks

Yana Valachovic
UC Cooperative Extension

Sudden Oak Death in Forestlands:

Conclusions

Conclusions

- We are still learning about this disease. Stay informed (COMTF newsletters; NC newsletter; website; trainings)
- You can take actions to manage this disease on your own property
- While it is likely to spread, collectively we can work together to combine our efforts
- Slowing the spread of the disease, will keep options available to you. It is better to be disease free

Conclusions

- By comparison, some progress is being made with Port Orford Cedar root disease
- SOD is re-writing pest and disease management and the interactions of nurseries and the wildland, creating more vigilance
- There have been differences in response from the regulatory agencies between and within states. Invasive Species Act?

Conclusions

- While there is not a pool of funding to treat the disease on your land, both EQIP and CFIP are aware of the situation and will prioritize projects that address SOD
- The team here is available to consult with you about management strategies and to manage and prepare for future impacts.

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May 13, 2010