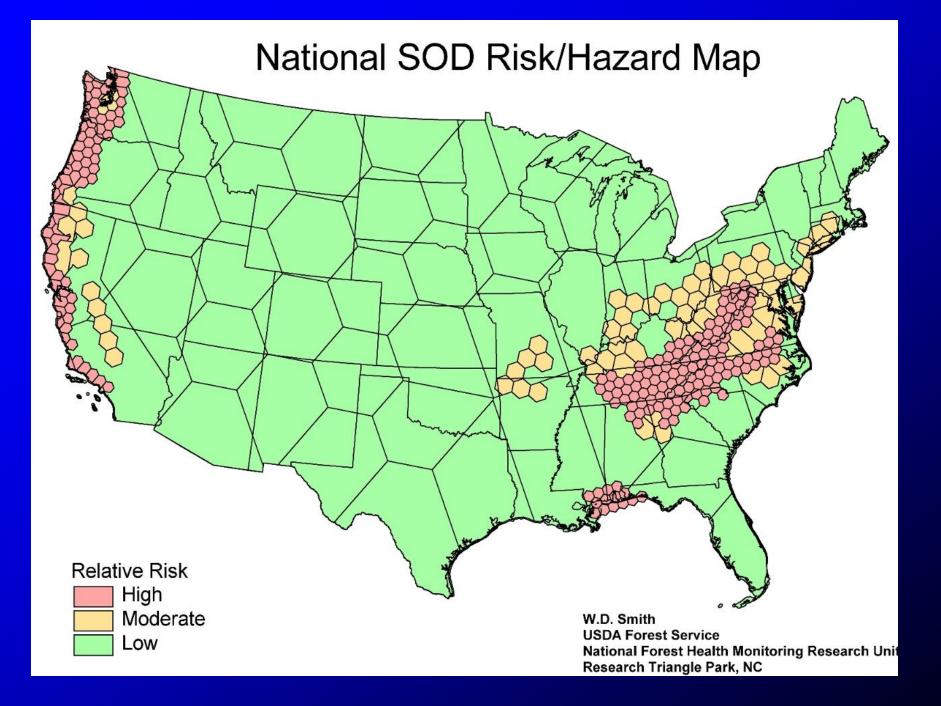
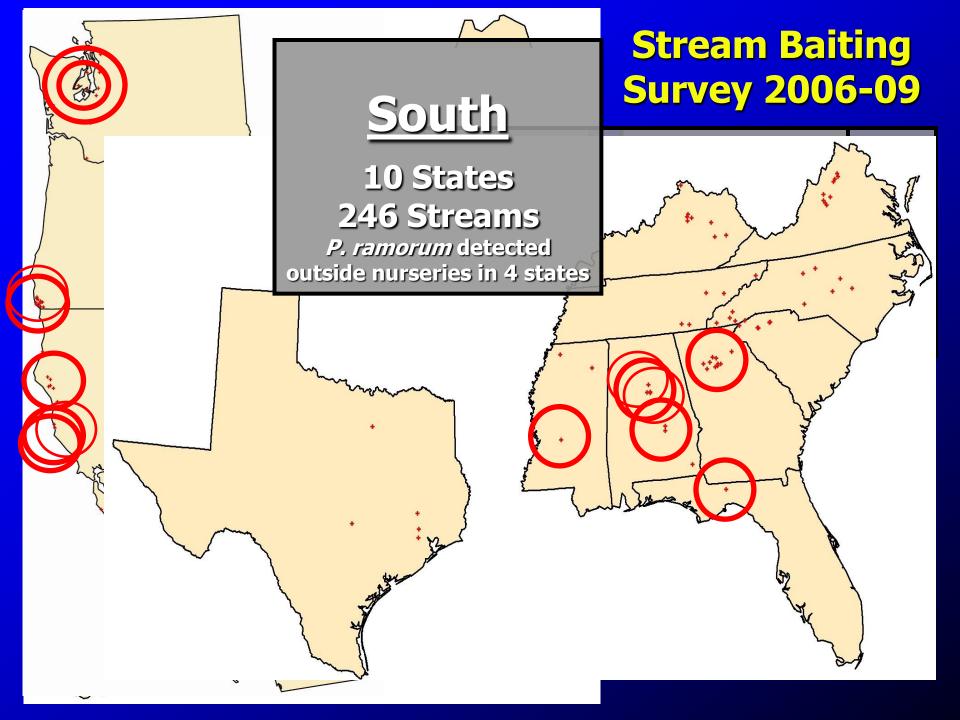
#### *Phytophthora ramorum* in Waterways Detected by the National Early Detection Survey of Forests Update and Implications

Steve Oak, Forest Pathologist USDA Forest Service Southern Region FHP COMTF San Rafael, CA 10 June 2010

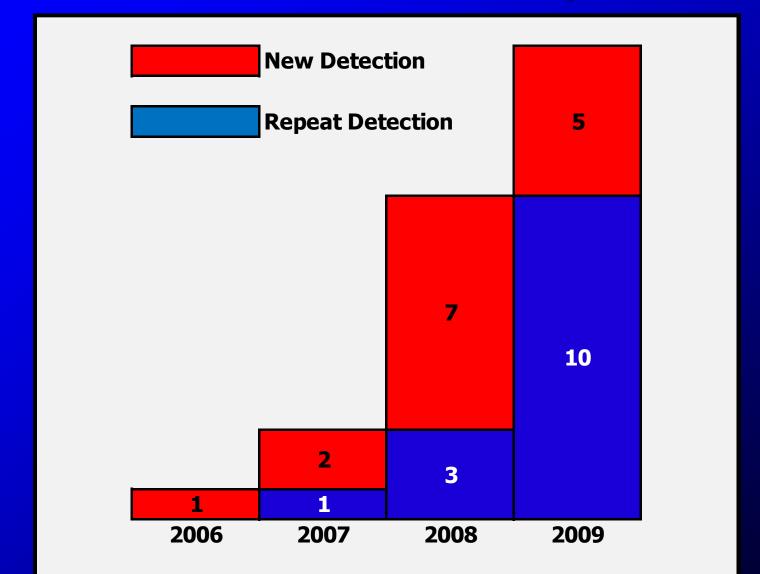
### Photo credit- Dan Omdal



| Stream Survey Totals by Region  |      |      |      |                        |       |                                   |
|---|------|------|------|------------------------|-------|-----------------------------------|
| Region (States)   | 2006 | 2007 | 2008 | 2009                   | Total | Unique<br>Watersheds <sup>1</sup> |
| West Coast (3)  | 37   | 32   | 39   | <b>25</b> <sup>2</sup> | 133   | 78                                |
| South (10)  | 33   | 64   | 71   | 78                     | 246   | 176                               |
| North Central (6)   | 0    | 20   | 15   | 0                      | 35    | 28                                |
| Northeast (9)   | 24   | 37   | 29   | 15                     | 105   | 82                                |
| National Total (28)   | 94   | 153  | 154  | 118                    | 519   | 364                               |
| <sup>1</sup> some watersheds surveyed in multiple years<br><sup>2</sup> 50 bait sites in one WA watershed |      |      |      |                        |       |                                   |



### **Stream Detection Survey** *P. ramorum* Detections by Year



## **P. ramorum** Risks to Forests What we know...

- The quarantine is "leaky".
- The pathogen persists in infested nurseries despite eradication measures.
- Inoculum is leaving infested nurseries in water.
- There is a plausible pathway from water to terrestrial ecosystems.
  - Two instances of terrestrial host plant infection
- Climate is at least seasonally suitable for infection.

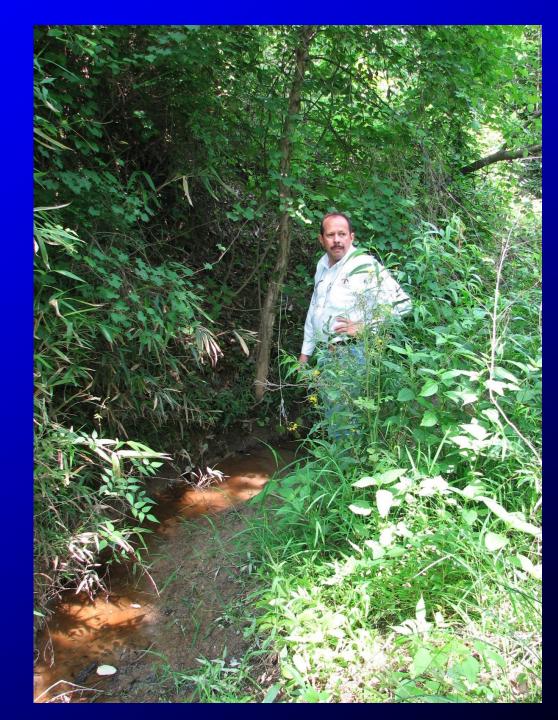
## **P. ramorum** Risks to Forests What we don't know...

#### • Epidemiology.

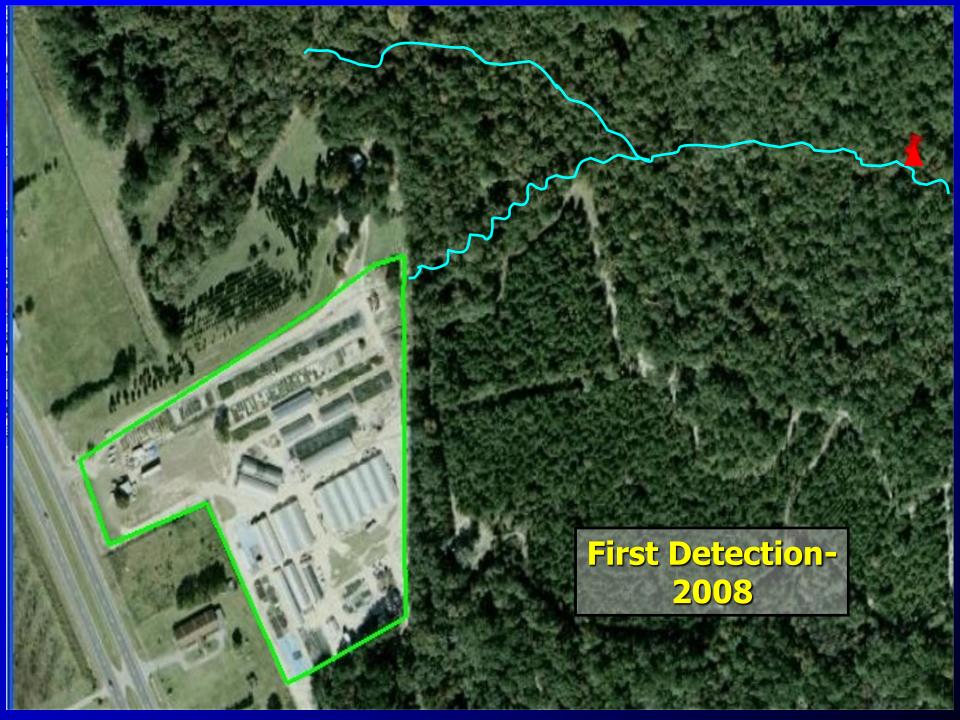
- Coincidence of sporulating hosts in infested streamside zones
- Sufficient sporulation to initiate/sustain epidemics?
- Suitable climate at the right time for infection?
- Lag time from infection to establishment to epidemic?
- Ecosystem effects?

## First Detection-2006

## First Detection-2007

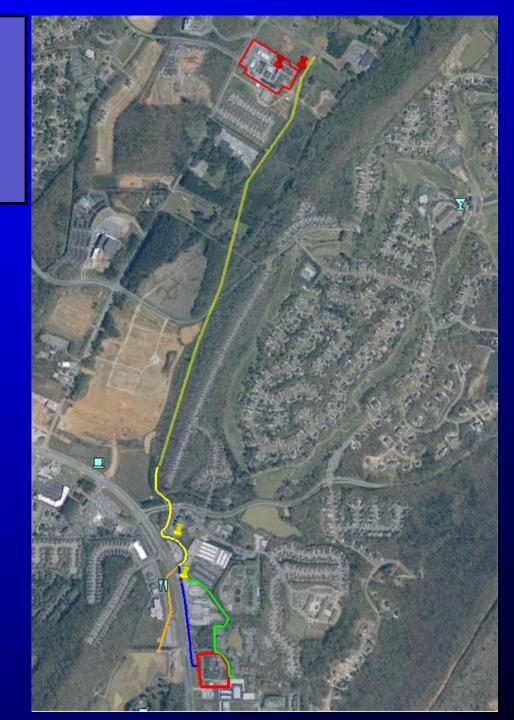






#### Location A First Detection- 2008

Location B First Detection- 2009







# Challenges

- Web of interactions
  - Regulatory
    - APHIS
    - State Ag Departments
  - Forest Health
    - USFS
    - State Forestry Agencies
    - Diagnostic Labs
- Roles and responsibilities for eradication of an infestation in "wildlands"