



# Forest Health Monitoring

Fact Sheet Series

## Sudden Oak Death National Detection Survey



### Background

Sudden Oak Death, a newly identified forest disease caused by the pathogen *Phytophthora ramorum*, has been killing thousands of tanoak and oaks in coastal areas of central California. Small infestations were recently found in southern Oregon and eradication efforts have begun.



Dead tanoaks and coast live oaks in Marin County, California

Laboratory investigations indicate that other oak species, including northern red and pin oak, are susceptible to the pathogen. Concerns regarding the risk of this disease to the Nation's oak forests have led to development of a National Sudden Oak Death Detection Survey of forests through the Forest Health Monitoring program.

- **Objectives** – Detect new infestations of *P. ramorum*, the cause of Sudden Oak Death, in forests outside the known infested areas.
- **Risk-based Sampling** – The survey design attempts to detect new infestations by increasing sampling intensity in areas at high risk to invasion by *P. ramorum*.
- **Risk Factors** – The following factors, reflecting current understanding of the biology and ecology of *P. ramorum*, were used to assign risk and develop sampling polygons (map attached):
  1. Presence of likely hosts
    - a. Known (West) or suspected (East) tree hosts
    - b. Known (West) or suspected (East) shrub hosts

2. Likely pathways of introduction to new areas
  - a. Rhododendron nurseries
3. Climatic factors
  - a. Moisture – length of yearly moist weather period
  - b. Temperature – extreme temperature limits
  - c. Months of optimum moisture/temperature combination

### ➤ Sampling Methods –

1. Site selection:
  - a. Forested areas around nurseries – Nursery selection based on Pilot National Survey for Nurseries coordinated by Animal and Plant Health Inspection Service.
  - b. General forested areas - Random sample locations are generated using road networks, host type, and risk category.
2. At each site, suspected host plants are sampled on four 100 meter transects.
3. Symptomatic leaves or stems are collected for laboratory analysis using approved diagnostic techniques.

### ➤ Pilot Surveys –

1. During the spring and summer of **2003**, survey crews collected samples of suspected hosts in PA, WV, VA, GA NC, SC, and TN. Diagnostic laboratories processed over 800 samples. None of these were positive for *P. ramorum*.
2. State and federal personnel conducted surveys in the following states during **2004**: South – VA, NC, GA, SC, AR, MS, AL, FL, LA, KY, TN, TX; Northeast – ME, NH, VT, NY, CT, RI, MA, PA, WV, MD, DE, NJ, OH, IN, IA, IL, MO, MI, MN, WI; Intermountain – UT, NV; and West Coast – CA, OR, WA. Highest priority for sampling was assigned to forests adjacent to nurseries that may have received infected nursery plants from CA. Over 4,500 samples were collected from nearly 1,000 locations. All were negative for *P. ramorum* except for two follow-up samples from Golden Gate Park in San Francisco, CA. This was the first report of the disease in San Francisco County.
3. In 2005, surveys continued in previously sampled States with the addition of OK and KS. Pilot tests sampling streams for *P. ramorum* were initiated in CA, OR, WA, GA

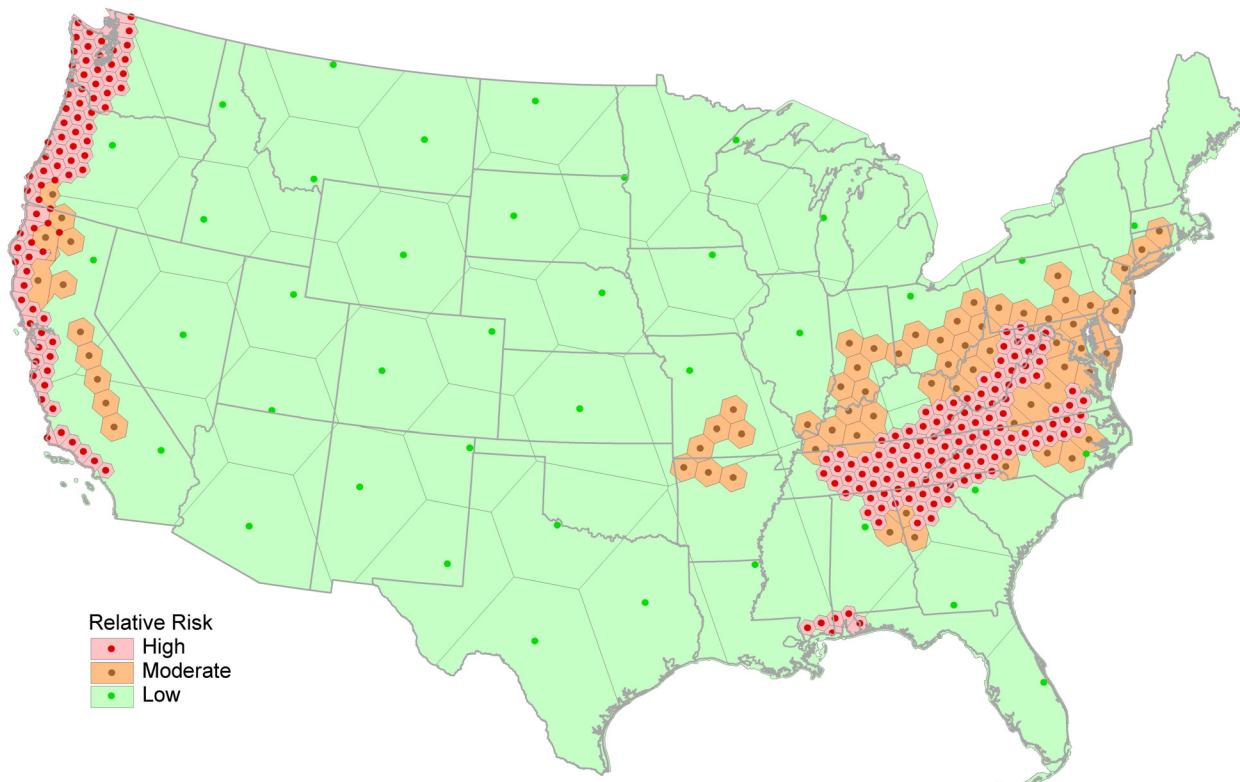
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- and SC. This appears to be a very sensitive early detection tool downstream from infested forest environments or nurseries.
4. Surveys continued in 2006 in most of the previously surveyed states. Stream sampling pilot has been expanded to include 10 states.
  5. Operational SOD surveys shifted to stream sampling only in 2007 and 2008. To date, 320 unique watersheds in 28 states have been sampled for *P. ramorum*. The pathogen has

been found outside the previously known range in OR and CA, as well as in water courses draining infested nurseries in WA, and MS. Supplemental sampling is being conducted in WA and MS to determine if the pathogen has become established in forest vegetation.

## Preliminary SOD Risk/Hazard Map



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