

# Addressing *Phytophthora ramorum* in California: Programs of the USDA Forest Service and California Department of Forestry and Fire Protection<sup>1</sup>

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## Abstract

Since 2000, the U.S. Department of Agriculture Forest Service and California Department of Forestry and Fire Protection have been collaborating on a comprehensive program to address sudden oak death, caused by *Phytophthora ramorum*, in California, investing over \$12 million of state and federal funds. The program's primary objectives are pathogen containment and maintenance of public safety, which are accomplished through monitoring, management, research, education and outreach. Monitoring efforts have included surveys of Southern California and the Sierra Nevada, as well as watershed, vegetation, and aerial surveys of high-risk terrain in and surrounding California's 14 infested, coastal counties. Education and outreach programs, utilizing [www.suddenoakdeath.org](http://www.suddenoakdeath.org), and collaborative efforts via the California Oak Mortality Task Force (COMTF), have trained thousands of professionals in pathogen detection, treatment, and management. Quarantine implementation, suppression efforts, hazard tree reduction, and debris disposal programs for *P. ramorum* are also on-going; a program overview is provided.

*Key words:* sudden oak death, *Phytophthora ramorum*, management, monitoring

## Introduction

Since 2000, the U.S. Department of Agriculture Forest Service (USDA-FS) and California Department of Forestry and Fire Protection (CDF) have been collaborating on a comprehensive program to address sudden oak death, caused by the pathogen *Phytophthora ramorum*, in California, investing over \$12 million of state and federal funds. The primary objectives of the program are pathogen containment and maintenance of public safety, which are accomplished through monitoring, research, management, education and outreach. The program is carried out via grants to cooperators at over 15 universities or agencies. The California Oak Mortality Task Force (COMTF) provides program coordination and collaboration, as well as education and outreach activities.

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## **Monitoring**

Early detection and some delimitation monitoring is carried out via aerial survey, watershed, and ground-based vegetation survey. In 2004 the following projects were implemented:

1. Aerial Survey (Jeff Mai, USDA Forest Service, and Walter Mark, Cal Poly San Luis Obispo)
2. Watershed Monitoring (David Rizzo, University of California, Davis)
3. Ground-Based Targeted Risk Survey (Ross Meentemeyer, Sonoma State University)
4. California National *P. ramorum* Survey (Don Owen, CDF, Redding)
5. North Coast Recreation Area Monitoring (Yana Valachovic and Chris Lee, University of California, Cooperative Extension, Humboldt and Del Norte Counties)
6. Reported finds follow-up (David Rizzo and John Bienapfl, University of California, Davis)

A risk model to help in planning and survey design is maintained by Meentemeyer, Sonoma State University. An interactive, GIS database for all wildland detections is managed by Kelly and Tuxin, University of California, Berkeley. Support for diagnostic services is provided to Rizzo, University of California, Davis and Garbelotto, University of California, Berkeley. Sierra Nevada and Southern California surveys have not detected *P. ramorum* in those ecosystems. Project results are posted in the monitoring section, at [www.suddenoakdeath.org](http://www.suddenoakdeath.org).

## **Management**

California's Sudden Oak Death management strategy divides the state into two regions with different objectives:

1. Northern California (Del Norte, Humboldt and Mendocino Counties) - *P. ramorum* wildland infections are few and isolated from other infestations. Our strategy is an aggressive slow-the-spread program. A suppression project was carried out in Southern Humboldt County to remove symptomatic plants in an old-growth redwood forest near Redway in February 2004. Cooperators include the Humboldt County Department of Agriculture and University of California Cooperative Extension, Humboldt and Del Norte Counties.
2. Central coastal California (Sonoma, Marin, Napa, Santa Cruz, and Monterey Counties) - *P. ramorum* is common in coastal evergreen and redwood/tanoak forests, so our strategy is containment to keep the pathogen from spreading to new areas. Various efforts have limited pathogen spread, including wash stations, regulatory enforcement, best management practices, education, and outreach. Details for many of these programs may be found at <http://www.suddenoakdeath.org>.

Throughout the infested area, sanitation and quarantine compliance are emphasized. In infested areas, all fire crews in California clean their equipment prior to departure. USDA-FS, CDF, and parks personnel are trained annually in quarantine compliance and sanitation for all operations. Plant debris collection sites (<http://groups.ucanr.org/SODBusters/>) are operating in Santa Cruz and Marin Counties and California-funded hazard tree removal along highways and other high-use areas.

### ***Education and Outreach***

The California Oak Mortality Task Force (COMTF) is an umbrella organization that brings together all groups working on sudden oak death (*P. ramorum*) in California. Education and outreach are carried out via [www.suddenoakdeath.org](http://www.suddenoakdeath.org), a monthly newsletter, informational meetings, training sessions, talks, and a public affairs program. In 2004, 11 training sessions on nursery and forestry aspects of *P. ramorum* reached well over 1,000 professionals. The education/outreach program is implemented by Janice Alexander, Outreach Specialist, University of California Cooperative Extension, Marin County; Katie Palmieri, Public Information Officer, University of California, Center for Forestry, Berkeley; and Chris Lee, Sudden Oak Death Specialist, University of California Cooperative Extension, Humboldt and Del Norte Counties.