



CALIFORNIA OAK MORTALITY TASK FORCE

AN OVERVIEW OF CALIFORNIA'S 2006 SUDDEN OAK DEATH/ *PHYTOPHTHORA RAMORUM* PROGRAM

Sudden Oak Death (SOD) is a forest disease caused by the plant pathogen *Phytophthora ramorum*. Since 1995, *P. ramorum* has killed more than a million native tanoak, coast live oak, and other susceptible tree species in the wildlands of 14 coastal California counties, from Monterey to Humboldt. Tree losses are continuing to occur in both wildland and urban/wildland interface areas, with up to 80 percent of trees affected in some stands. This unprecedented die-off of oaks and tanoaks in California is causing dramatic landscape changes that affect ecosystem function, increase fire and safety hazards, reduce land values, and diminish aesthetic values.

P. ramorum infection is also killing trees in the forests of Curry County, Oregon as well as in limited areas of the United Kingdom, the Netherlands, and Germany. Not only a forest pathogen, it has also been found in nurseries and gardens in the US and Europe on many common horticultural plants. With an extensive and increasing host list that affects garden and forest plants alike, numerous disciplines, including horticulture, forestry, arboriculture, and waste management are impacted. Additionally, infested lands span a wide range of ownerships and can be found in areas where millions of people live and recreate, making management to sustain open space greenbelts, recreation areas, and other landscapes a priority. To help contain the pathogen, thereby protecting unexposed forests outside of the quarantined counties, international, federal, and State regulations are in place. However, in areas where the pathogen is already established, research, management, monitoring, and education efforts are vital to minimizing hazardous conditions as well as maximizing pathogen suppression and containment.

With no one department or agency alone having the resources to address this problem, the California Oak Mortality Task Force (COMTF) is coordinating the efforts of more than 75 organizations that are cooperatively implementing California's Sudden Oak Death program. With goals of protecting forest health, maintaining public safety, and preventing pathogen spread, these organizations are collaborating to design and enforce quarantine regulations, conduct forest and nursery monitoring and research, manage infested forests and nurseries, educate professionals as well as homeowners, and inform policy makers. The following is a brief synopsis summarizing key activities that comprise California's 2006 CA Sudden Oak Death/*P. ramorum* activities.

Regulation Enforcement: The California Department of Food and Agriculture (CDFA), USDA Animal and Plant Health Inspection Service (APHIS), and county agriculture departments continue to enforce and update State and federal *P. ramorum* quarantines. Annual inspections are ongoing for all California nurseries that ship host and associated host plants interstate as well as for nurseries that ship non-hosts interstate but have host and associated host plants on-site. Additionally, all nurseries and other industries within the 14-county infested area are required to undergo monthly inspections of interstate

shipments, and all infested material from within the quarantined counties cannot leave the quarantine area without gaining permits from affected county agricultural commissioners.

Research: The USDA Forest Service Pacific Southwest Research Station manages a \$2 million per year Sudden Oak Death/*P. ramorum* research program. More than 50 grants are currently in place at universities and research institutions worldwide. The primary research objective is to develop a wildland treatment. Research is currently being conducted on: biology, epidemiology, and disease behavior; detection and spread; disease management and resource utilization; disease impacts on ecosystem components; and economic impacts. This year, efforts in CA have resulted in the identification of numerous new hosts, refinement of treatment and diagnostic regimes, and the discovery of a third *P. ramorum* lineage. The program coordinates with other *P. ramorum* research programs including the USDA Agricultural Research Service and the EU-Risk Analysis of *Phytophthora ramorum*.

Wildland Monitoring: The USDA Forest Service (FS), in cooperation with the University of California (UC), CA State University, and UC Cooperative Extension (UCCE), has completed their annual *P. ramorum* aerial survey. Focusing efforts on CA's high-risk wildlands, 20,000 acres of new infection were mapped this year. The California Department of Forestry and Fire Protection (CDF) also conducted the CA National *P. ramorum* Survey of Forest Environments in cooperation with the USDA FS, and found no new areas of infection. Additionally, UC and UCCE watershed and vegetation monitoring activities are ongoing in over 110 areas of the state, and have led to the detection of new infestations in Mendocino and Humboldt County this year. No new counties were found to be infested.

Nursery Management: The CA Association of Nurseries and Garden Centers, along with nursery representatives nationwide, has developed industry recommended best management practices (rBMPs) to help stop the inadvertent spread of the pathogen in nursery environments. Review and refinement of the rBMPs by APHIS and the National Plant Board, along with industry representatives, is underway. Once finalized, training will be provided to growers. A draft copy of the rBMPs is currently available on the COMTF website.

Big Sur SOD Management Project: Funded by the USDA FS, this research project is just beginning to be implemented by UC researchers, in cooperation with Monterey County's Big Sur community members. The goals of the research project include preservation of tanoak as a species in the Big Sur Area via Agri-Fos® application on high-risk individual trees and the lowering of inoculum levels in the local area through the selective removal of CA bay laurel trees. Researchers will provide free first-time treatment applications for all qualifying trees, with landowners agreeing to maintain treatments thereafter. Additional recommended land management practices are also being implemented. Once initial treatment is complete, plots will be assessed annually to analyze success/failure rates.

Southern Humboldt County Experimental SOD Treatment Project: Funded by the USDA FS, this project is a cooperative effort by UCCE, CDF, CA State Parks (CSP), Southern Humboldt Fire Safe Council, and several private landowners and contractors. In 2006, approximately 140 acres of infested public and private property were treated to control *P. ramorum* spread in the area surrounding Redway - the known epicenter of the disease. Humboldt County has had a relatively isolated area infested with *P. ramorum* compared to the rest of California. Given this condition, the group has had the unique opportunity to try to control the disease in the wildlands. They have implemented a program of early detection and response to new infested areas where feasible by installing a series of strategically located experimental treatments on the perimeter of the infestation in the hopes of disease containment. The treatments involved the removal of infected CA bay laurel and tanoak trees. Vegetation was pile burned and broadcast burning will be implemented in some of the treatment areas in the fall.

Through these experimental treatments, the group is also developing some techniques to help landowners with long-term management of the pathogen, testing which treatments are biologically effective, financially affordable, and socially acceptable. A comprehensive educational outreach program is also in place to help stop the artificial spread of *P. ramorum*. Intensive monitoring of project results will be ongoing for several years.

Kashia Band of Pomo Indians SOD Management Project: The USDA FS is funding this ongoing project, first implemented in 2004. A collaborative effort, UC researchers and Phytosphere Research scientists are assisting the Kashia people with *P. ramorum* land management strategies for the Rancheria. Project activities also include determining the efficacy of Agri-Fos® when used to protect tanoak, and whether or not Agri-Fos® affects acorns.

Western Sonoma County SOD Management Project: The creation of a Sonoma County SOD Task Force is underway to facilitate the crafting and implementation of a *P. ramorum* management program in an effort to protect County forests and address fire threat concerns. To assist with planning, CDF personnel have flown the local area, mapping current areas of mortality, and they will also be assessing fire risks. Project implementers plan to assess current infection levels as well as anticipated mortality levels, and plans for an educational outreach campaign are being developed. On-the-ground strategies for public and private lands have been discussed, in addition to options for utilizing and/or removing dead trees.

Education and Outreach: Educational and outreach activities continue to be an ongoing, cooperative effort, often coordinated by the COMTF, and including experts from all involved disciplines. This year's highlights include: the COMTF annual meeting on Research and Management (Carmel, March 2006), numerous training sessions, website (www.suddenoakdeath.org) improvements, a monthly newsletter, media assistance, and numerous presentations to over 2,000 people.