# CALIFORNIA OAK MORTALITY TASK FORCE REPORT
# JULY 2005

## MONITORING

***P. ramorum* has been recovered from symptomatic tissues of California maidenhair fern (*Adiantum jordanii*) and spice bush (*Calycanthus occidentalis*) collected at Jack London State Park, Sonoma County, CA.** Laboratory results have been forwarded to the California Department of Food and Agriculture as well as USDA APHIS for review. For more information on these two plants and their symptoms, see Hosts of the Month.

**In early March, 2005, Point Reyes National Seashore staff conducted a *P. ramorum* survey along several of the seashore trails that traverse areas where host species are abundant.** In addition, graduate student researcher Katie Hayden from UC Berkeley obtained two positive cultures for *P. ramorum* within Point Reyes National Seashore boundaries. For a map of the known *P. ramorum*-positive locations within Point Reyes National Seashore and the Golden Gate National Recreation Area North District grounds, go to: http://nature.berkeley.edu/comtf/pdf/Maps/SOD Testing Results 2005 11x17.pdf For more information, contact Dave Schirokauer, Point Reyes National Seashore GIS Biologist, at: Dave_Schirokauer@nps.gov.

**The 2005 California Sudden Oak Death/*P. ramorum* aerial and ground-check survey is underway.** The flyovers are a collaborative effort between the USDA Forest Service and California Polytechnic State University, San Luis Obispo. This 5th annual survey will map new and known *P. ramorum*-related tree mortality in the 14 quarantined California counties and host habitat in counties adjacent to those under quarantine, thereby gaining more information on the spread and scope of the pathogen in forested settings. Newly identified tree mortality will be followed up by ground-check surveys within currently uninfested and minimally infested counties. Field crews conducting the surveys will sample *P. ramorum* symptomatic tissue for laboratory confirmation at the UC Davis laboratory. These early detection survey efforts will facilitate greater disease containment and suppression activities.

## NURSERIES

**A retail nursery in Bradley County, Tennessee was found to have *P. ramorum*-positive *Rhododendron elegans* "Elegans" and *Rhododendron* spp. "Boursault" during their *P. ramorum* National Nursery Survey inspection.** Trace-back investigations at the source West Coast nursery are underway. The USDA Confirmed Nursery Protocol (CNP) has been implemented at the Tennessee nursery.

**A production nursery in Lincoln County, Oregon has been found with infected *Rhododendron* sp.** The nursery was found to be infested as the

result of a compliance agreement renewal. Investigations are underway, and the CNP has been implemented.

**A retail nursery found to have *P. ramorum*-positive plants in Los Angeles County, CA shipped plants directly to customers, not nurseries or garden centers.** Shipments went to 32 states nationwide as well as 9 foreign countries. Regulatory officials are informing affected states of the shipments.

**Six additional California nurseries have been identified as *P. ramorum*-positive; one had been found positive for the pathogen previously.** Five of the nurseries are production facilities and one is a retail site. Of the two nurseries that ship interstate, one only ships stock to Nevada.

**In 2005, 62 sites in 5 states have had *P. ramorum* detections.** Positive findings by state are: CA(48), GA(2), LA(2), OR(9), and TN(1).

## RESEARCH

**Funded projects for the FY'05 USDA Pacific Southwest Region (PSW) *P. ramorum* Request for Proposals have been selected.** PSW funded 12 proposals, allocating $800,000 during this funding cycle. Chosen proposals represent a broad array of disciplines, and include projects throughout the US as well as internationally. Forty proposals were submitted in response to the request, for a total of $5 million. The list of funded projects, as well as a list of current and continuing PSW-funded *P. ramorum* research, can be found on the COMTF website at: www.suddenoakdeath.org under Research. For further information contact Susan Frankel, Sudden Oak Death Research Program Manager, USDA Forest Service, PSW at: sfrankel@fs.fed.us.

**Moritz, M. A. and Odion, D. C. 2005. Examining the strength and possible causes of the relationship between fire history and Sudden Oak Death. *Oecologia*. DOI 10.1007/s00442-005-0028-1.**

Abstract: Fire can be a dominant process in the ecology of forest vegetation and can also affect forest disease dynamics. Little is known about the relationship between fire and an emerging disease epidemic called Sudden Oak Death, which is caused by a new pathogen, *Phytophthora ramorum*. This disease has spread across a large, fire-prone portion of California, killing great numbers of oaks and tanoaks and infecting most associated woody plants. Suitable hosts cover a much broader geographic range, raising concern over where the disease may spread. To understand the strength and potential sensitivities of a fire-disease relationship, we examined geographic patterns of confirmed *P. ramorum* infections in relation to past fire history. We found these infections to be extremely rare within the perimeter of any area burned since 1950. This finding is not caused by spatial bias in sampling for the disease, and is robust to variation in host abundance scenarios and to aggregation of closely spaced sampling locations. We therefore investigated known fire-related factors that could result

in significantly lower incidence of the disease in relatively recently burned landscapes. Chemical trends in post-fire environments can influence the success of pathogens like *P. ramorum*, either by increasing plant nutrient stress or by reducing the occurrence of chemicals antagonistic to *Phytophthoras*. Succession in the absence of fire leads to greater abundance of host species, which will provide increased habitat for *P. ramorum*; this will also increase intraspecific competition where these trees are abundant, and other density-dependent effects (e.g. shading) can reduce resource allocation to defenses. Despite these findings about a fire-disease relationship, a much deeper understanding is necessary before fire can be actively used as tool in slowing the epidemic.

**UC Berkeley Professor Robert Lane and colleagues, studying the ecology, epidemiology, and prevention of Lyme disease and other emerging tick-borne diseases in California, have found the highest risk habitats for exposure to spirochete-infected ticks are various subtypes of dense woodlands carpeted with leaf litter, such as those that occur in many habitats affected by Sudden Oak Death.** Interested in studying the impact of Sudden Oak Death on Lyme disease risk in northwestern California, the team visited China Camp State Park's Miwok Meadows and Back Ranch Campground earlier this year and collected 98 adult ticks. Of those collected, 3.9 or 6.4% of the ticks from each site were determined by PCR to contain Lyme disease spirochetes. Since the infection rates in the nymphal ticks typically range several times higher than those in adult ticks from the same population, the infection rates in the nymphs could range as high as 10-15% or higher in springtime (though no nymphs have been tested from either site so far). In Mendocino County, infection rates in adult ticks average about 1-4%, whereas nymphal infection rates in most of the 30 plus study sites in that county have averaged around 5 to 15%, with a few sites having infection rates as high as 25-41%. The latter infection rates are as high as those in some of the most highly infested regions of the northeastern US.

The research team also notes that considerable contact with wood in dense woodlands (e.g., sitting on logs or against tree trunks, gathering wood) is even riskier than prolonged contact with leaf-litter areas. Consequently, it is recommended that anyone working in dense woodlands when nymph ticks are active (April through June and into July in some areas) follow precautions, paying particular attention to clothing and skin, checking both several times per day for ticks. Other advised precautions include tucking pant legs into socks, shirts into pants, and using a tick repellent or toxicant on clothing. For more information, go to the UC Integrated Pest Management "Lyme Disease in California" Pest Note at: http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7485.html or contact Lane at (510) 642-4385 or blane@nature.berkeley.edu.

**The Canadian Forest Service's Pacific Forestry Centre has recently awarded funding to Brenda Callan to develop a synthesis paper by March 2006 on the potential impact of *P. ramorum* on Western**

**Canadian forest tree species and ecosystems.** With many of the *P. ramorum* host plants being important components to Western Canadian forests, establishment of the pathogen in British Columbia could change the province's ecosystem composition as well as restrict trade and movement of forest products regionally and across Canadian borders.

The purpose of the paper will be to review published literature highlighting the aspects of the pathogen's biology and ecology that could potentially impact the health of Western Canadian forests. By developing a comprehensive assessment document based on current science and Canadian-specific forest issues, Canadian Forest Service scientists will be better able to advise lead Canadian agencies on *P. ramorum* pathogenicity, host associations, risk of spread, and methods of eradication or containment. Such information will assist regulatory officials in developing reasonable, science-based quarantine, certification, and transport of plants and plant products in forestry and nursery settings. For more information on the project, contact Brenda Callan, Canadian Forest Service, Pacific Forestry Centre, at: BCallan@pfc.cfs.nrcan.gc.ca.

## REGULATIONS

**USDA APHIS and National Plant Board representatives met with Canadian Food Inspection Agency (CFIA) and Canadian Forest Service representatives in Quebec to harmonize *P. ramorum* inspection, sampling, and response protocols.** CFIA and USDA analyzed current Confirmed Nursery Protocols, identifying several gaps and inconsistencies between them prior to the workshop. While some concerns were resolved at the meeting, others were assigned to individuals to develop recommendations for the working group. Resolved items will be implemented as soon as possible.

Research needs were also identified at the meeting, and will be catalogued by the Pest Risk Analysis group along with those needs identified by the CFIA and USDA Pest Risk Assessments (PRA). These needs will be communicated to the research community. With both CFIA and USDA PRAs found to identify the same significant risks, the PRAs are agreed upon and will be periodically updated as new information becomes available. Additionally, both CFIA and USDA Pest Risk Analysis groups will develop and maintain a common document of *Phytophthora ramorum* Pest Information. USDA is also conducting an analysis of high-risk *P. ramorum* hosts for delivery this summer. The results of this analysis will be used for development of specific mitigation measures for identified high-risk plants. CFIA and USDA harmonization communications are still underway to finish addressing issues not covered by the Quebec agenda and to complete the implementation of consensus items from the meeting.

**The USDA Animal and Plant Health Inspection Service (APHIS) published a final rule on 6/23 that amended treatment regulations for California bay laurel (*Umbellularia californica*) leaves to include vacuum heat as a treatment option for leaves moving interstate from**

**an area under *P. ramorum* quarantine.** This treatment was developed and added at the request of the spice industry in the area under quarantine which had its business impacted by the 2002 Federal Quarantine. The final rule is posted to the APHIS website at: http://www.aphis.usda.gov/ppd/rad/webrepor/ppq.html.

## RESOURCES

**The updated USDA Forest Service (FS) Western Sudden Oak Death (*P. ramorum*) Pest Alert is now available on the CA Oak Mortality Task Force website at: www.suddenoakdeath.org.** This 1-page informational sheet is useful as a general handout and includes background information on the disease as well as symptoms and other look-alike diseases.

**Oregon State University Extension has developed and posted "Nursery Guidelines for the Exclusion and Management of *Phytophthora ramorum* in Nurseries" to their website.** Topics addressed include keeping *P. ramorum* out of a nursery as well as cultural practices to reduce disease risk and losses, including nursery field layout strategies, sanitation information, fungicides, water management, and monitoring. To access this information, go to: http://extension.oregonstate.edu/emergency/oak_death.php.

**A Sudden Oak Death/*P. ramorum* wanted poster has been developed for display in public areas.** The poster alerts the public to *P. ramorum* and provides tear-off tabs at the bottom of the poster for interested parties to take home website information where further resources on the subject can be found at: http://www.ncipmc.org/alerts/suddenoakdeath/index.cfm. To order copies of the poster, contact Susan Ratcliffe, North Central Integrated Pest Management Facilitator, University of Illinois, at: sratclif@uiuc.edu.

## FUNDING

**The US House of Representatives approved nearly $6 million for Sudden Oak Death in the 2006 Agricultural Spending Bill.** If the bill goes through as is, $3 million would be allocated to USDA APHIS for regulatory issues, $2 million would go to the USDA Agricultural Research Service for pathogen-related research, and $930,000 would be allocated to the USDA Cooperative State Research, Education, and Extension Service for education and outreach purposes. The bill has been forwarded to the Senate and is expected to be heard next month.

## PERSONNEL

**Susan Frankel has left her position as Plant Pathologist for the USDA Forest Service, State and Private Forestry to join the USDA Forest Service, Pacific Southwest Research Station in Albany, CA.** In her new role, which began June 12th, Frankel assumed the title of Sudden Oak Death/*P. ramorum* Research Program Manager. She may be reached in her new position at: (510) 559-6472 or via email at: sfrankel@fs.fed.us.

**Don Gasser, COMTF Biomass Co-chair, retired from his position with Pacific Gas and Electric.** Gasser's new phone number for Task Force-related activities is (707) 253-0576. He may also be contacted via email at dgasser@napanet.net.

**Ross Meentemeyer left his position as Assistant Professor and Director of the Geographic Information Center at Sonoma State University in June, where he focused on landscape ecology and spatial analysis, particularly as it related to the spread of *P. ramorum* in CA forests.** In his new position with the University of North Carolina at Charlotte, he will be an Associate Professor and Director of a newly established Center for Applied Geographic Information Science in the Department of Geography and Earth Sciences. In his new role, Meentemeyer will continue work on his current Sudden Oak Death (SOD) projects and plans to stay integrally involved in SOD research and management issues with his collaborators. Meentemeyer can be reached in his new position at (704) 687-2293 or via email at: rkmeente@email.uncc.edu. For a list of Meentemeyer's ongoing SOD/*P. ramorum* research, go to: http://suddenoakdeath.sonoma.edu.

**Art Wagner, having left his Washington State Department of Agriculture Pathologist position on July 15, 2004, has recently taken a new position as a Pest Survey Specialist with the USDA APHIS PPQ Wisconsin office.** While *P. ramorum* will no longer be the main focus of his job, he still plans to stay as involved in the subject as his current duties will allow. Wagner can be reached in his new position at (608) 231-9577 or via email at: arthur.c.wagner@aphis.usda.gov.

## HOSTS OF THE MONTH

***Adiantum jordanii* (California maidenhair fern) – native to California and southern Oregon, this fern is found in shaded hillsides and in moist woody areas under oaks and pines or on damp banks at the base of rocks and trees.** Fronds are twice-divided and grow to 2ft. Maidenhair fern requires steady moisture and soil rich in organic matter. It is s close relative of *Adiantum* spp commonly sold as a houseplant and appreciated for its graceful form and delicate structure.

The symptomatic maidenhair fern were found at Jack London State Park along a trail with symptomatic woodrose, western starflower, and CA bay laurel. Symptoms on the ferns ranged from leaf spots to entirely necrotic leaves.

**References:**


- Brenzel, Kathleen. Sunset Western Garden Book. Menlo Park, CA: Sunset Publishing Corporation, 2001. p 172.
- Las Pilitas Nursery
  Adiantum jordanii
  http://www.laspilitas.com/plants/19.htm

- Personal email communication
  Dave Rizzo, Professor
  Department of Plant Pathology, UC Davis
- Southern California Wildflowers and Other Plants
  California Maidenhair Fern
  http://www.calflora.net/bloomingplants/californiamaidenhairfern.html


***Calycanthus occidentalis* (Spice Bush) – This deciduous shrub is native to California's Coast Ranges and Sierra Nevada foothills, growing along streams and moist slopes.** It grows 4-12 ft. high and equally as wide. Its bright green leaves turn yellow in the fall, and range from 2-6 inches long and 1-2 inches wide. In mid- to late spring or summer, brownish red fragrant flowers up to 2 inches across can be found. Spice bush requires regular watering and grows well in sun or shade. It is tolerant of sandy or clay soil, as well as poor-drainage and seasonal flooding. It can be trained into a spice vine or used as a multi-stemmed small tree, but is best as a background shrub or screen.

Symptomatic spice bush samples from Jack London State Park were found along a creek near symptomatic bigleaf maple and CA bay laurel. Symptoms on spice bush ranged from leaves with necrotic lesions along leaf margins to dead leaves. The lesions were grayish-brown in color, and some had a dark margin. Small necrotic spots were also observed beyond the lesions found on spice bush. (While this is the first official confirmation of spice bush, original identification was made by Arborist Rob Gross in Sonoma County.)

**References:**


- Brenzel, Kathleen. Sunset Western Garden Book. Menlo Park, CA: Sunset Publishing Corporation, 2001. p 242.
- Las Pilitas Nursery
  Calycanthus occidentalis
  http://www.laspilitas.com/plants/127.htm
- Personal email communication
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