



CALIFORNIA OAK MORTALITY TASK FORCE REPORT MARCH 2012

MONITORING

The Washington State Department of Agriculture will no longer be monitoring waterways in the state as of 2012. Nursery-level monitoring required under the Confirmed Nursery Protocol will continue. Stream baiting efforts are still be conducted by the Washington Department of Natural Resources (DNR); however, with 2012 sampling having commenced in late January in 5 counties and 10 watercourses. The first (of likely six) round of samples has been retrieved for analysis. In addition to leaf baiting, DNR will be working with the USDA Forest Service on “Bottle of Bait” protocols to assay each of the streams for *P. ramorum*. More baiting stations will likely be added to the survey over the course of the sampling period if *P. ramorum* is detected at any of the sites.



***P. ramorum*-positive Camphor (*Cinnamomum camphora*; *Lauraceae*) trees** were confirmed in Mill Valley, Marin County for the first time in a neighborhood setting in September 2011. It is believed that the pathogen moved from the forest into the urban setting. Appearing to be more susceptible than previously thought, symptoms include leaf lesions, branch tip dieback, and stem cankers. Pathogenicity experiments have been completed and genotyping of the isolate is underway. Camphor is on the USDA Animal and Plant Health Inspection Service regulated *P. ramorum* host list. It was first listed as an associated host after being identified in nurseries in 2006.

The UC Berkeley Garbelotto lab is now accepting submissions of tree locations tested for *P. ramorum* in California for SODMAP. This new mapping tool is designed to broaden California's SOD-related outreach, with maps being generated in user-friendly Google Maps and Google Earth formats. The goal of SODMAP is to have detailed knowledge of SOD-positive and -negative sample locations on a yearly basis, so communities can follow the spread of SOD in their local area and act accordingly. SOD Blitz maps will be incorporated into SODMAP; however, distribution of *P. ramorum*-positive nurseries will **not** be included.

To provide information for inclusion in the 2011 SODMAP, please refer to the sample [submission form and instructions](#). All data for posting should be emailed to Doug Schmidt (dschmidt@berkeley.edu) no later than **March 30, 2012**. Please only submit *P. ramorum* results that have been confirmed by laboratory analysis (culturing, PCR, etc.).



Negative and positive *P. ramorum* sample submissions are encouraged. All confirmations will be shared with OAKMAPPER pending submitter approval.

To get more information and to download files with instructions on how to format your data, go to <http://nature.berkeley.edu/garbelotto/english/sodmap.php>.

RESEARCH

Cobb, R.C.; Filipe, J.A.N.; Meentemeyer, R.K.; Gilligan, C.A.; and Rizzo, D.M. Ecosystem transformation by emerging infectious disease: loss of large tanoak from California forests. *Journal of Ecology*. 11 pages. DOI: 10.1111/j.1365-2745.2012.01960.x

Summary

1. Few pathogens are the sole or primary cause of species extinctions, but forest disease has caused spectacular declines in North American overstory trees and restructured forest ecosystems at large spatial scales over the past 100 years. These events threaten biodiversity associated with impacted host trees and other resources valued by human societies even when they do not directly cause host extinction.
2. Invasion of *Phytophthora ramorum* and emergence of the forest disease sudden oak death has caused a large-scale decline of tanoak (*Notholithocarpus densiflorus*) in Californian coastal forests. Here, we describe structural changes to tanoak forests and develop predictive models of infection rates, mortality rates and changes in tanoak biomass and abundance by combining regionally extensive longitudinal field studies and mathematical modeling.
3. Pathogen-invaded stands had smaller average tanoak tree size and higher proportions of large dead tanoak trees compared with uninvaded stands. This pattern is caused in part by a positive relationship between tanoak size and mortality rate, as well as prolific basal sprouting from trees killed by the disease. Tanoak infection, mortality and biomass decline rates were positively related to the prevalence of infection in sporulation-supporting species, especially California bay laurel (*Umbellularia californica*).
4. We developed a stage-structured and spatially explicit mathematical model including species dynamics and *P. ramorum* transmission, where the long-term outcome of disease ranges from host extinction when densities of bay laurel are high to limited or no disease outbreak. Low densities of tanoak in a matrix of non-susceptible neighboring species resulted in slow-enough transmission to retain overstory tanoak, suggesting host-density thresholds may exist in real forests.
5. Synthesis. Tanoak is likely to persist in many disease-impacted forests via vegetative reproduction, but overstory trees may be eliminated or greatly reduced in abundance, a pattern similar to other forest diseases that have emerged in the last century including chestnut blight and beech bark disease. Our results support a general model of disease-caused changes to forest trees useful for the analysis of emerging forest pathogens where vegetative reproduction, community-level epidemiology and stage-specific mortality rate interact to determine local disease intensity and host decline.

Grünwald, N.J.; Garbelotto, M.; Goss, E.M.; Heungens, K.; and Prospero, S. In press. Emergence of the sudden oak death pathogen *Phytophthora ramorum*. *Trends in Microbiology* xx (2012) 1–8. DOI: 10.1016/j.tim.2011.12.006.



Abstract: The recently emerged plant pathogen *Phytophthora ramorum* is responsible for causing the sudden oak death epidemic. This review documents the emergence of *P. ramorum* based on evolutionary and population genetic analyses. Currently infection by *P. ramorum* occurs only in Europe and North America and three clonal lineages are distinguished: EU1, NA1 and NA2. Ancient divergence of these lineages supports a scenario in which *P. ramorum* originated from reproductively isolated populations and underwent at least four global migration events. This recent work sheds new light on mechanisms of emergence of exotic pathogens and provides crucial insights into migration pathways.

FEATURED RESEARCH



Sudden oak death increases forest fuels and puts infested stands at higher risk of severe wildfire, according to new research. The study found fuel buildups in Douglas-fir-tanoak forests with high Sudden Oak Death (SOD)-related hardwood mortality could increase wildfire flame lengths by 3 to 4 feet and double a wildfire's rate of spread, depending on how much time has elapsed since initial infection. Not only does SOD alter fuel quantity in these forest types, but it can

also change the arrangements of fuels, posing serious challenges to firefighter response in infested stands. After trees die from the disease, they can remain standing with dry, dead leaves for several years, greatly increasing the likelihood of crown fire under extreme weather conditions. Likewise, the increased fuels on the forest floor can take a long time to break down, posing a long-term fire hazard and additional risks to firefighters. In many cases, modeled wildfire conditions in SOD-impacted forests exceed safety thresholds for hand crews, calling for changing suppression tactics and strategies, such as more heavy equipment, aircraft use, and indirect lines.

Citation: Valachovic, Y.S.; Lee, C.A.; Scanlon, H.; Varner, J.M.; Glebocki, R.; Graham, B.D.; and Rizzo, D.M. 2011. Sudden oak death-caused changes to surface fuel loading and potential fire behavior in Douglas-fir-tanoak forests. *Forest Ecol. Mgt.* 261:1973-1986. DOI: 10.1016/j.foreco.2011.02.024.

RELATED ISSUES

***Phytophthora austrocedrae* has been identified for the first time in England infecting juniper (*Juniperus communis*) trees in Upper Teesdale, North Pennines.** The pathogen infects the rare, native conifer through the root system, causing the foliage to decline and die.

P. austrocedrae was first reported in 2007 in Argentina and Chile and is cause of “mal del ciprés, decline of Chilean cedars (*Austrocedrus chilensis*), in Patagonia, South



America. It is transmittable in ground water, infected plant material, and contaminated soil, making containment challenging. The source of the England infestation is unknown.

Studies are underway to confirm how damaging *P. austrocedrae* might be on juniper, Lawson cypress, and other potential tree hosts, and surveys are underway in areas where juniper is found to determine disease distribution in an effort to inform long-term strategies. Control plans will be developed with local landowners, farmers, and other stakeholders in the infested area.

The pathogen was first confirmed in the UK in 2011 on Lawson cypress (*Chamaecyparis lawsoniana* or Port Orford Cedar) and Nootka cypress (*Callitropsis nootkatensis*) at two sites in Scotland. For more information, go to www.forestry.gov.uk/paustrocedrae.

FUNDING

The National Ornamentals Research Site at Dominican University of California (NORS-DUC) fiscal year 2012/2013 Request for Proposals has been announced. The deadline for submission is Friday, April 27, 2012. Proposals reflecting short-term applied research, including, but not limited to, methods development to inhibit *P. ramorum* spread; mitigations to manage *P. ramorum*; epidemiological studies on inoculum sources, pathways, soil sampling focal points, and disease distribution in nurseries are encouraged. Each proposal must comply with the California Environmental Quality Act and the National Environmental Policy Act for bio-safety. Applicants must also obtain a Plant Pest Permit from the California Department of Food and Agriculture and a permit from the California Department of Pesticide Regulation for any materials evaluated at NORS-DUC. Approximately \$200,000 is available to fund projects ranging from \$15,000 to \$50,000. Researchers, including international colleagues, who have already secured funding and only need space are strongly encouraged to apply. Proposals should be submitted to RFP.norsduc@dominican.edu. For questions, email [Sibdas Ghosh](mailto:SibdasGhosh).

RELATED RESEARCH

Harrington, T.C.; McNew, D.; Young Yun, H. 2012. Bur oak blight, a new disease on *Quercus macrocarpa* caused by *Tubakia iowensis* sp. nov. Mycologia; Vol. 104, No. 1.

MEETINGS

[The Fifth Sudden Oak Death Science Symposium \(SOD 5\)](#) has been extended a half day, and will now be held from June 19 – 22, 2012. Collectively, over 70 papers and posters have been submitted. Speakers will be notified by March 9. The meeting includes a field trip on 6/19, presentations on 6/20 – 6/22, and a poster session on 6/20. Field trip stops will include Quarryhill Botanical Garden for an introduction to biosecurity risks, international plant hunters, and the rare Asian species on display; Bouverie Wildflower Preserve for a hike through oak woodlands with SOD discussions regarding long-term system changes and restoration post SOD; and the Matanzas Creek Winery and Lavender Farm for a tour of the lavender fields and wine tasting. [Register](#)



[for the Symposium](#), and view [travel information](#) including securing overnight accommodations at the Sheraton.

RESOURCES

The article “Treating irrigation water” in the February 2012 issue of *Digger* magazine, pages 42 – 45, discusses water treatment methods that can be effective at eliminating damaging water molds in nurseries. To access the piece by Jennifer Parke and Paul Fisher, go to

http://www.oan.org/associations/4440/files/digger/Digger_201202_pp41-45_web.pdf.

The Forest Insect Disease Leaflet on Port-Orford-Cedar Root Disease was recently updated. To access it, go to

http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5346825.pdf.

CALENDAR OF EVENTS

- 3/7 - SOD Treatment Workshop; meet at oak outside of Tolman Hall, UC**
Berkeley Campus; 1:00 – 3:00 p.m.; Pre-registration is required. This class is free and will be held rain or shine. To register, or for questions, email kpalmieri@berkeley.edu, and provide your name, phone number, affiliation and license number (if applicable), and the date for which you are registering. For more information, go to <http://nature.berkeley.edu/garbelotto/english/sodtreatmenttraining.php>.
- 3/8 - "A Planner's Guide for Oak Woodlands;" Part one in a four-part UC ANR**
webinar lecture series: Overview of the Hardwood Rangeland Resource; For more information, see the Education section above or go to http://ucanr.org/sites/oak_range/Planners_Guidelines_for_Oak_Woodlands/.
- 3/15 - "A Planner's Guide for Oak Woodlands;" Part two in a four-part UC ANR**
webinar lecture series: Land Management Strategies; For more information, see the Education section above or go to http://ucanr.org/sites/oak_range/Planners_Guidelines_for_Oak_Woodlands/.
- 3/22 - "A Planner's Guide for Oak Woodlands;" Part three in a four-part UC ANR**
webinar lecture series: Planning Strategies; For more information, see the Education section above or go to http://ucanr.org/sites/oak_range/Planners_Guidelines_for_Oak_Woodlands/.
- 3/29 - "A Planner's Guide for Oak Woodlands;" Part four in a four-part UC ANR**
webinar lecture series: Sources of Assistance, Developing Plans; For more information, see the Education section above or go to http://ucanr.org/sites/oak_range/Planners_Guidelines_for_Oak_Woodlands/.
- 4/11 - SOD Treatment Workshop; meet at oak outside of Tolman Hall, UC**
Berkeley Campus; 1:00 – 3:00 p.m.; Pre-registration is required. For more information, see the 3/7 listing above.
- 4/21 - "A Planner's Guide for Oak Woodlands" webinar registrant optional field**
trip to Hopland Research and Extension Center; For more information, see the Education section above or go to http://ucanr.org/sites/oak_range/Planners_Guidelines_for_Oak_Woodlands/.



- 4/21 – **Marin County SOD Blitz; Initial meeting location will be at Dominican University; For more information, contact Sibdas Ghosh at Sibdas.ghosh@dominican.edu.**
- 4/28 – **East Bay (Berkeley) SOD Blitz; Initial meeting location will be in Berkeley; For more information, contact Susan Schwartz at F5creeks@aol.com.**
- 4/28 – **East Bay (Orinda) SOD Blitz; Initial meeting location will be in Orinda; For more information, contact Bill Hudson at wllm@earthlink.net.**
- 5/1 - **San Francisco SOD Blitz; Initial meeting will be at Golden Gate Park Presidio; For more information, contact Christa Conforti at CConforti@presidiotrust.gov.**
- 5/1 - **San Francisco SOD Blitz; Initial meeting will be at Golden Gate Park; For more information, contact Gloria Koch-Gonzalez at Gloria.Koch-Gonzalez@sfgov.org.**
- 5/2 - **SOD Treatment Workshop; meet at oak outside of Tolman Hall, UC Berkeley Campus; 1:00 – 3:00 p.m.; Pre-registration is required. For more information, see the 3/7 listing above.**
- 5/5- **"A Planner's Guide for Oak Woodlands" webinar registrant optional field trip to Sierra Foothill Research and Extension Center; For more information, see the Education section above or go to http://ucanr.org/sites/oak_range/Planners_Guidelines_for_Oak_Woodlands/.**
- 5/5 - **Carmel Valley SOD Blitz; For more information, contact Tim Jensen at tjensen@mprpd.org.**
- 5/12 - **Mount Tamalpais SOD Blitz; For more information, contact Andrea Williams at awilliams@marinwater.org.**
- 5/12 - **Napa SOD Blitz; For more information, contact Bill Pramuk at info@billpramuk.com.**
- 5/19 - **Sonoma SOD Blitz; For more information, contact Lisa Bell at lkbell@ucdavis.edu.**
- 5/19 - **Santa Cruz SOD Blitz; For more information, contact Annie Murphie at PLN400@co.santa-cruz.ca.us.**
- 5/21 – 5/25 – **“4th International Workshop for *Phytophthora*, *Pythium*, and *Phytophythium*” and International Web Symposium, “Oomycetes of Regulatory Concern in International Trade;” University of Maryland, College Park, MD; The primary purpose of the workshop is to provide hands-on training on morphological and molecular tools used to identify species within genera. For more information, go to <http://www.psla.umd.edu/faculty/Balci/workshop2011/index.cfm>.**
- 5/26 - **Los Alto Hills SOD Blitz; For more information, contact Sue Welch at sodblitz09@earthlink.net.**
- 6/2 - **Woodside/Portola Valley SOD Blitz; For more information, contact Debbie Mendelson at naturemend@sbcglobal.net.**
- 6/2 - **Atherton SOD Blitz; For more information, contact Susan Finocchio at susanfin@earthlink.net.**
- 6/6 - **SOD Treatment Workshop; meet at oak outside of Tolman Hall, UC**



- Berkeley Campus; 1:00 – 3:00 p.m.; Pre-registration is required. For more information, see the 3/7 listing above.
- 6/9 - South Skyline SOD Blitz; For more information, contact Jane Manning at skyline_sod@yahoo.com.**
- 6/16 - Burlingame Hills SOD Blitz; For more information, contact Steve Epstein at steveepstein0206@gmail.com.**
- 6/19 – 6/22 - The Fifth Sudden Oak Death Science Symposium (SOD 5);** Sheraton Sonoma County; 745 Baywood Drive; Petaluma. For information on the conference, go to <http://ucanr.org/sites/sod5/>. For additional information regarding submission of abstracts and conference planning, contact Katie Palmieri at kpalmieri@berkeley.edu. For questions regarding registration, contact Janice Alexander at jalexander@ucdavis.edu.
- 9/9 – 9/14 – Sixth Meeting of the International Union of Forest Research Organizations IUFRO Working Party 7-02-09 “Phytophthora in Forests and Natural Ecosystems;”** Colegio Mayor Universitario Nuestra Señora de la Asunción, Avd. Menéndez Pidal s/n, 14004 Córdoba, Spain; For more information, contact M^a Pérez Sierra at aperesi@eaf.upv.es or see <http://iufrophytophthora2012.org/>.