



CALIFORNIA OAK MORTALITY TASK FORCE REPORT NOVEMBER 2016

MONITORING

***Phytophthora ramorum* was detected for the first time in San Luis Obispo County during the 2016 citizen scientist-based sudden oak death survey (SOD Blitz) of California forests and parks.** Positive samples were found on California bay laurel throughout much of the county in native landscapes, making it the 16th *P. ramorum*-positive county in the state and the southern-most wildland detection. Because these are the first detections of the pathogen south of Monterey County, the UC Berkeley Garbelotto lab will be working closely with the California Department of Food and Agriculture and USDA Animal and Plant Health Inspection Service to validate the data for regulatory use. Mortality of susceptible true oaks is not yet evident, suggesting the outbreaks are recent.

Overall the SOD Blitz survey results indicate a substantial increase in *P. ramorum* infection levels compared to 2015. The pathogen was also identified for the first time on Mount Diablo (Contra Costa County) on bay laurel. New outbreaks were identified near Ukiah and southern coastal Mendocino County as well as in the city of Piedmont (Alameda County) and several areas east of Highway 280 on the San Francisco Peninsula. Infected trees were also detected in areas where *P. ramorum* infection had subsided as a result of the drought, including northern and central Sonoma County and the Napa Valley region. A significant outbreak on bay was identified in San Francisco's Golden Gate Park near the AIDS Memorial Grove (first found positive in 2004) and, for the first time, *P. ramorum* was found in the San Francisco Botanical Garden at Strybing Arboretum, which houses an international plant collection. Infected trees at the Arboretum include two possible new host species which are currently being evaluated further for official confirmation.

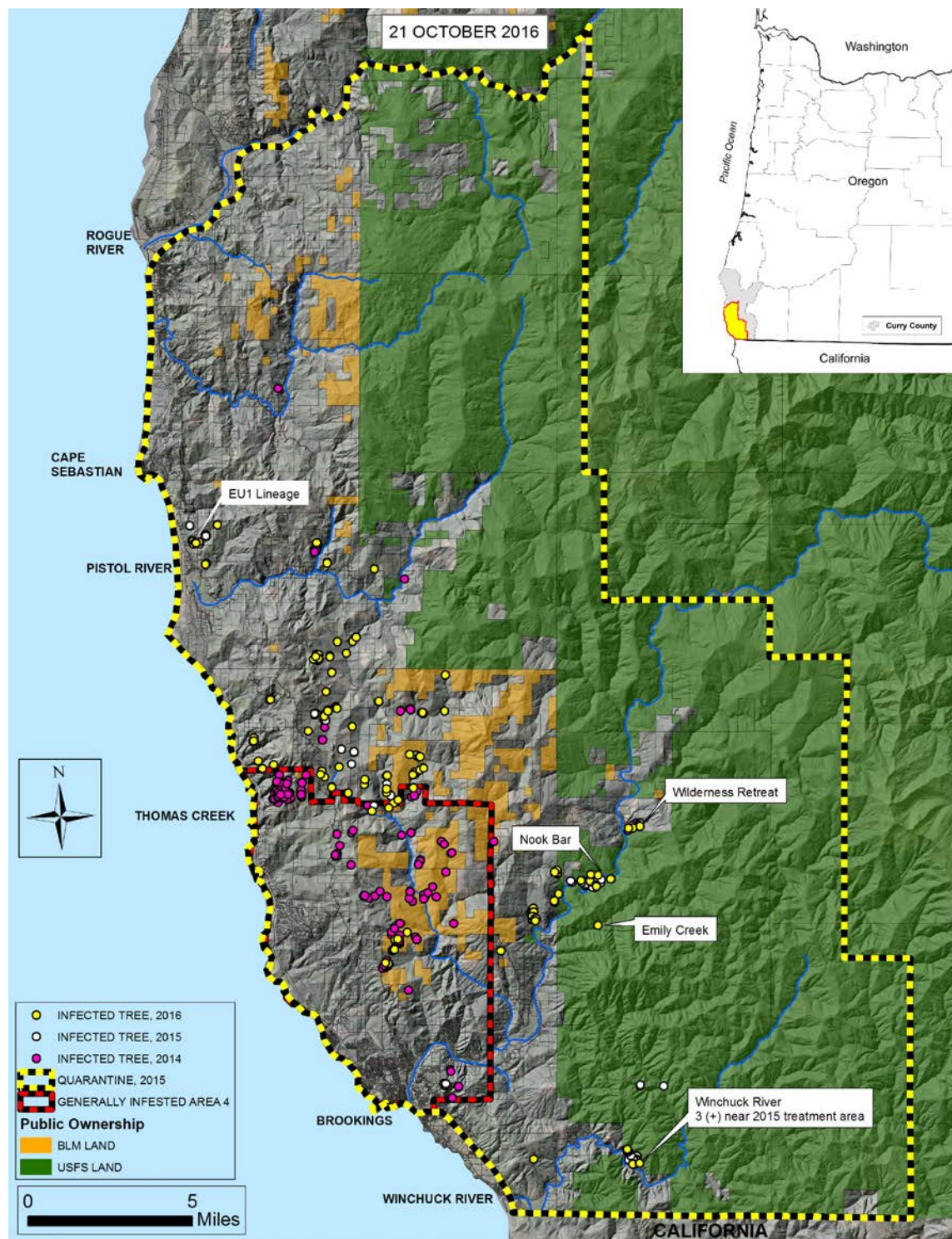
In some areas where outbreaks had decreased, the pathogen reemerged, such as in Big Sur (Monterey County), where *P. ramorum* infection rates increased by 27 percent. In Marin County, infection rates increased by 2.3 percent, and in some areas of California that used to be marginally affected by SOD, there have been sharp increases in infection, such as in western San Mateo and western Santa Cruz Counties.

The 2016 SOD Blitzes included 23 spring training sessions and approximately 500 volunteers who surveyed over 14,000 trees and submitted symptomatic samples to the Garbelotto lab for diagnostic testing. Data collected from the Blitzes (both positive and negative samples) have been uploaded to the SOD Blitz map (www.sodblitz.org) as well as to SODmap (www.SODmap.org) and the free SODmap mobile app and can serve as an informative management tool for those in impacted communities.

The EU1 *P. ramorum* lineage has been found in Oregon wildlands for a second time, ½ mile south of the one EU1-infested tanoak found in 2015. Of the 25 positive trees identified, one grand fir seedling and 12 tanoaks are confirmed positive for EU1, with lineage results still pending for another grand fir and 11 tanoaks. The find came following the detection of an EU1-positive Pistol River stream bait 18 miles north of Brookings in August 2016, after which the Oregon Department of Forestry (ODF) conducted a waterway survey of the upper portions of a stream north of the Pistol River. Two separate infestations of tanoak were discovered along the stream, one was determined to be the NA1 lineage and the other the EU1 lineage. This new EU1



infestation is located between the 2015 EU1-positive tanoak site and a now closed ornamental nursery, which, based on molecular testing, was the probable source of the 2015 EU1 infestation. The new EU1 infestation will be ODF's top treatment priority this fall and will include a 300-600 ft treatment buffer.





***P. ramorum*-positive western larch (*Larix occidentalis*) were identified in a western Scotland arboretum during the biannual Forestry Commission Scotland aerial survey.** This is the first confirmation of the pathogen in the wider environment on western larch and the first confirmation of the pathogen at this site. The finding was in a small plot of trees within the arboretum that were growing poorly (likely due to poor site/species suitability). The infected trees have been felled. Larch plantations within a 250 m boundary outside of the arboretum will also be felled before the trees leaf out in the spring. The remaining larch at the arboretum will be intensely monitored. The nearest known *P. ramorum* infestations occurred between 2008 and 2011 on several rhododendron bushes (subsequently destroyed) approximately 5 km away. The finding has been confirmed using RT-PCR. Researchers are hoping to identify the pathogen lineage; however, the samples are very resinous, so culturing may not be possible. For more information, contact Anna Brown at Anna.Brown@forestry.gsi.gov.uk.

CALIFORNIA FOREST PRACTICE MODIFICATION

The California Forest Practice Act has been updated, clarifying that oak woodland restoration activities do not constitute a “conversion” of conifer stands, allowing oak trees to remain the dominant tree type in woodlands. Assembly Bill 1958 (Wood), signed by Governor Brown in September, creates a 7-year pilot “exemption” to the timber harvest plan (THP) permitting process for smaller diameter conifer removal to maintain or restore oak woodlands. These updates will provide much needed relief to Oregon white oak and California black oak woodlands suffering from conifer encroachment in northern California, which is resulting in associated loss of wildlife habitat, cultural uses, biodiversity, stream flow, and other ecosystem services. Without regenerative fires that historically occurred more frequently on the landscape, Douglas-fir and other conifer species are invading and quickly out-competing mature oak stands. Now that this Bill has been signed into law, the California Board of Forestry and Fire Protection will work to adopt the regulations. The new conifer removal “exemption” is likely to be available January 1, 2018. The full text of the bill can be found at <http://leginfo.legislature.ca.gov>.

NURSERIES

Water and soil samples at a Sacramento County nursery were found negative for *P. ramorum* in September following confirmation of infested camphor (*Cinnamomum camphora*) trees at the facility in August. The nursery is the only site in the USDA APHIS federal *P. ramorum* program that is currently undergoing the Confirmed Nursery Protocol in the state. The federal fall compliance survey at the nursery was completed in October; results are pending. Compliance Surveys for the remaining six nurseries participating in the USDA APHIS federal *P. ramorum* program are underway.

RESEARCH

Swiecki, T.J.; Bernhardt, E.A.; Aram, K.; Rizzo, D.M.; Kasuga, T.; and Bui, M. 2016. *Phytophthora ramorum* Causes Cryptic Bole Cankers in Canyon Live Oak. Plant Health Progress. 17: 20-26.

Abstract: Mortality of large canyon live oaks suddenly appeared in natural stands in San Mateo, CA, starting in 2007. A survey of affected stands showed that symptomatic trees were spatially associated with California bay, the primary source of *Phytophthora ramorum* spores in California coastal oak forests. Trunk canker symptoms on affected trees were similar to late-



stage symptoms caused by *P. ramorum* on other oak hosts, but the pathogen could not be isolated from affected trees. Artificial inoculation of logs, and later, trees, confirmed that *P. ramorum* caused phloem cankers on canyon live oak, but cankers showed either no or minuscule external bleeding. Knowledge of early bark symptom appearance facilitated successful isolations from naturally infected trees. Tree declines associated with similarly cryptic *Phytophthora* cankers could remain undiagnosed or misdiagnosed for many years, thwarting detection and management efforts.

RELATED RESEARCH

Feau, N.; Taylor, G.; Dale, A.L.; Dhillon, B.; Bilodeau, G.J.; Birol, I.; Jones, S.J.M.; and Hamelin, R.C. 2016. Genome Sequences of Six *Phytophthora* Species Threatening Forest Ecosystems. *Genomics Data*. 10: 85-88.

Jung, T.; Jung, M.H.; Scanu, B.; Seress, D.; Kovács, G.M.; Maia, C.; Pérez-Sierra, A.; Chang, T.-T.; Chandelier, A.; Heungens, K.; van Poucke, K.; Abad-Campos, P.; León, M.; Cacciola, S.O.; and Bakonyi, J. 2016. Six New *Phytophthora* Species from ITS Clade 7a Including Two Sexually Functional Heterothallic Hybrid Species Detected in Natural Ecosystems in Taiwan. *Persoonia - Molecular Phylogeny and Evolution of Fungi*. <https://doi.org/10.3767/003158517X693615>.

Klapwijk, M.J.; Hopkins, A.J.M.; Eriksson, L.; Pettersson, M.; Schroeder, M.; Lindelöw, Å.; Rönnerberg, J.; Keskitalo, E.C.H.; and Kenis, M. 2016. Reducing the Risk of Invasive Forest Pests and Pathogens: Combining Legislation, Targeted Management and Public Awareness. *Ambio*. 45: 223. DOI: 10.1007/s13280-015-0748-3.

Saul, W.-C.; Roy, H.E.; Booy, O.; Carnevali, L.; Chen, H.-J.; Genovesi, P.; Harrower, C.A.; Hulme, P.E.; Pagad, S.; Pergl, J. and Jeschke, J.M. 2016. Assessing Patterns in Introduction Pathways of Alien Species by Linking Major Invasion Databases. *J Appl Ecol*. doi:10.1111/1365-2664.12819.

CALENDAR

11/15 – 11/16 – California Forest Pest Council 65th Annual Meeting, “California Forests – Severe Drought Takes Its Toll;” UC Davis Student Community Center, Davis; For agenda information or to register, go to <http://caforestpestcouncil.org/2016/07/save-the-date/>. For more information, contact Katie Harrell at kpalmieri@berkeley.edu.

11/25 – Deadline for USDA Forest Service, Pacific Southwest Region, State and Private Forestry, Forest Health Protection FY2017 *Phytophthora ramorum* Request for Management Pre-Proposals; Due by 4:00 pm.; For questions or a copy of the Request for Proposals, contact Phil Cannon at pcannon@fs.fed.us or (707) 562-8913.

3/19 /17– 3/25/17 - 8th Meeting of IUFRO Working Party 7.02.09: *Phytophthora* in Forests and Natural Ecosystems; Sapa Vietnam; For information or to register, go to <http://www.iufrophytophthora2017.org/>.