

## A CHRONOLOGY OF *PHYTOPHTHORA RAMORUM*, CAUSE OF SUDDEN OAK DEATH AND OTHER FOLIAR DISEASES

### 05/16

- After a positive find in 2015, monthly surveys of the Kitsap County botanical garden were negative for *P. ramorum* in February and March; results from perimeter and riparian area surveys are pending.
- Eight eastern states (AL, FL, GA, MS, NC, PA, SC, and TX) participated in the 2015 National *P. ramorum* Early Detection Survey of Forests; 3 of the 566 samples taken were *P. ramorum* positive - two from AL (first detection in 2009) and one from NC (first detection in 2010). All samples were collected from streams associated with previously positive nurseries.
- Fifteen Oregon nurseries are participating in the 2016 annual *P. ramorum* re-certification process - 11 are a part of the federal (interstate) certification program and four are part of the state (intrastate) program.
- The Midpeninsula Regional Open Space District Board of Directors approved \$524,000 for SOD and nursery-related Phytophthoras research and management over the next 10 years. Areas of focus will include SOD-related preventative treatments, tanoak resistance, and oak forest restoration, as well as further development of clean nursery practices.

### 02/16

- The 2016 Farm Bill, Plant Pest and Disease Management and Disaster Prevention Program (Section 10007) awarded \$1,284,528 in *Phytophthora ramorum*-related program funding to 17 states with California receiving \$692,308 of the available funds.
- The Systems Approach to Nursery Certification (SANC) initiative aims to improve the process for certifying nursery stock and reducing pest risk movement at the interstate shipping level. A pilot project to test the feasibility of the risk-based certification program was implemented 15 months ago at eight nursery and greenhouse facilities, all of which completed risk assessments. SANC program representatives are considering a Phase 2 Pilot Project which would include a second group of nurseries and greenhouses.
- The Karuk Tribe will begin implementing a *P. ramorum* stream monitoring program in 2016, on two tributaries of the Klamath River in the downriver portion of traditional tribal territory.
- Recent findings in southwest England suggest that European sweet chestnut trees (*Castanea sativa*) are being infected by long-distance spread of *P. ramorum* spores. There is also evidence suggesting that the disease might be 'cycling' among sweet chestnut trees. Until 2015, sweet chestnut had only been found infected in close proximity to other infected sporulating hosts, such as larch and rhododendron, putting them under heavy inoculum pressure.

- The U.S. Department of the Interior released "[Safeguarding America's Lands and Waters from Invasive Species: A National Framework for Early Detection and Rapid Response](#)" urging the National Invasive Species Council (NISC) to provide leadership in early detection and rapid response for invasive species to help limit their spread as well as economic and environmental impacts. The report is a first step towards building U.S. capacity to forecast which non-native species pose the greatest risk to the country, bolster current monitoring and response actions underway, and position public and private partners to be prepared to take immediate action when the next invasive species arrives.

## 12/15

- Two new *P. ramorum*-positive plants were confirmed at the Kitsap County, WA botanical garden. Both plants were in close proximity to one another and to a previously positive site.
- In 2015, the CDFA Plant Pest Diagnostic Center tested 7,613 plant, water, and soil samples for *P. ramorum*. Two of the samples were positive and the result of a trace-forward investigation from a positive Washington nursery. Ninety-one nurseries in the quarantine area received monthly inspections to retain their *P. ramorum* clean nursery stock certification, allowing them to ship host material outside of the quarantine zone. The seven nurseries participating in the USDA's *P. ramorum* compliance program for previously positive nurseries were all negative for the pathogen.
- In 2015, *P. ramorum* was recovered from 18 nurseries (AL 1, CA 1, NY 1, OR 12, WA 1, VA 2), one commercial landscape (LA), two residences (OH, OR), and a botanic garden (WA) in non-quarantine areas. The pathogen was detected in *Arctostaphylos* (1); *Camellia* (3); *Gaultheria* (1); *Kalmia* (1); *Mahonia* (1); *Osmanthus* (1); *Pieris* (6); *Rhododendron* (57); soil samples (17); *Vaccinium* (6); *Viburnum* (9); *Vinca* (1); and water samples (3). Eight of the nurseries ship interstate and are in the USDA APHIS federal compliance program (Federal Order DA-2014-02). Six of the eight actually shipped interstate. The Confirmed Nursery Protocol has been completed in 16 of the 18 nurseries and resulted in two site detections (1 CA nursery, 1 OH residence) from one of the positive interstate shippers.
- The 2015 United Kingdom *P. ramorum* aerial survey covered 146,000 acres of Japanese larch plantations and 2.5 million wooded acres. The pathogen remained generally consistent on larch, with low-level symptoms found on individuals or small groups of trees in close proximity to previously confirmed larch and rhododendron infestations. *P. ramorum*-positive larch was found for the first time in North Yorkshire, northeast England, 53 miles from the nearest known larch infestation. Follow-up surveys revealed previously undetected infected rhododendron, which is believed to be the inoculum source.
- The seven California nurseries that opted into the USDA Animal and Plant Health Inspection Service *P. ramorum* Compliance Program completed their fall inspections, collecting a total of 3,073 plant, water, and soil samples, which all tested negative for the pathogen.

- Extensive surveys at the Kitsap County, WA botanical garden found no pathogen in the perimeter of the property or in the neighboring native woodland. Four new detections were found in the managed garden proper, on *Rhododendron* (2), *Camellia* (1), and *Vaccinium* (1), with a fifth positive on a *Gaultheria* was found during a delimitation survey. All detections were in close proximity to previously positive sites, and all infected plants were destroyed in November.
- So far in 2015, *P. ramorum* was reported in 13 nurseries (CA 1, NY 1, OR 9, WA 1, VA 1), one commercial landscape (LA), two residences (OH, OR), and a botanic garden (WA) in non-quarantine areas on plants (*Arctostaphylos* (1); *Camellia* (3); *Gaultheria* (1); *Kalmia* (1); *Mahonia* (1); *Osmanthus* (1); *Pieris* (5); *Rhododendron* (43); *Vaccinium* (5); *Viburnum* (9); *Vinca* (1)), soil samples (13), and water samples (2).
- Redwood National Park completed its treatment of 131 acres of *P. ramorum*-positive trees and the surrounding buffer zone in the park that began in August 2015. Since October 2014, the park has treated 283 acres of mixed old-growth and second-growth redwood forests in an effort to slow the spread of SOD.
- The *P. ramorum* quarantine expansion in Oregon reduced the allowable harvest area for Christmas trees on the Rogue River-Siskiyou National Forest (Curry Co., OR.). Harvesting Douglas-fir and other *P. ramorum* host plants for firewood, boughs, or Christmas trees is now prohibited on 185,809 acres of the forest, three-times the area quarantined in 2014 (55,890 acres).

#### 10/15

- The 2015 SOD Blitz found coastal mountain infestation levels in areas such as Big Sur, the Santa Cruz Mountains, and western Sonoma County remain high despite an overall decline in infection rates from 4.4 to 3.7% across California's 15 infested counties. New SOD outbreaks of note include bay laurel trees near UC Berkeley's West Gate, a California lilac shrub in the Presidio in San Francisco, an infected bay laurel tree in a previously unreported area of Danville (Contra Costa County), and an urban park in Saratoga (Santa Clara County) found positive for the first time.
- Washington State University volunteers did intensive sampling of the Dungeness River (near Sequim, WA; Clallam County), which had been positive for *P. ramorum* in 2013. Sampling in 2014 did not yield information about the source of inoculum, and the 2015 sampling found no *P. ramorum*, suggesting the pathogen may no longer be present in the watershed.

#### 09/15

- Of the 275 samples collected so far this year from 9 states participating in the 2015 USDA FS National *P. ramorum* Early Detection Survey of Forests (AL, GA, MS, NC, PA, SC, CA, OR, and WA), two *P. ramorum*-positive samples were recovered from a previously positive AL watershed (first positive in 2009) and two samples from one MS site (previously positive) were inconclusive.

- The Scottish Government published a [Strategy for \*Phytophthora ramorum\*, 2015-2017](#), that aims to manage and control the rate of *P. ramorum* spread in Scotland to protect the health of trees, shrubs, and heathland.

#### 08/15

- The EU1 lineage has been recovered from a tanoak in Oregon, for the first time on US forest vegetation (previously only found in nurseries, streams, and European forests). The pathogen was first isolated by OSU in February 2015; in May 2015, USDA ARS completed their periodic genotyping and identified the EU1 clonal lineage. The lone EU1-infected tree was located on non-industrial private land, approximately 1 mile north of a small private (now closed) nursery near the Pistol River (Curry Co.) that had previous *P. ramorum* confirmations (August 2012). Comparison of the genotypes of the tanoak and nursery isolates suggests the nursery as the probable source for the forest infestation.
- Five new watersheds in Humboldt (3) and Mendocino (2) Counties tested *P. ramorum* positive. All previous detections were also found positive (Humboldt-12, Mendocino-7). In Monterey County, the pathogen was recovered from two of the five known infested waterways. From February to June, 139 sites in five counties (Del Norte-19, Humboldt-72, Mendocino-32, Monterey-7, and San Luis Obispo-9) were monitored throughout northern and central coastal California. Monitoring was not conducted in the Sierra Nevada region, Sonoma, or San Benito Counties this year.
- Redwood National Park has treated 152 acres over two sites (94 acres; 58 acres) since discovering SOD in 2014. Treatments have included using herbicides, or removing all infected tanoak and bay trees within each infestation as well as within a 100-meter buffer zone. Follow-up surveys of the treated area this spring revealed *P. ramorum*-positive tanoak and bay trees adjacent to both treatment sites, resulting in an additional 131 acres (70 acres and 61 acres) needing to be treated in the next few months.
- From January 1 to August 6, 2015, *P. ramorum* has been reported in 13 nurseries (CA 1, NY 1, OR 9, WA 1, VA 1), one commercial landscape (LA), two residences (OH, OR), and a botanic garden (WA) in non-quarantine areas on *Arctostaphylos* (1); *Camellia* (2); *Kalmia* (1); *Mahonia* (1); *Osmanthus* (1); *Pieris* (5); *Rhododendron* (41); soil samples (8); *Vaccinium* (4); *Viburnum* (9); *Vinca* (1); and a water sample (1). The OH and OR residential confirmations were the result of trace-forward investigations from a positive WA nursery.

#### 07/15

- The Oregon Department of Agriculture expanded the Curry County *Phytophthora ramorum* quarantine area from 264 sq. mi. to 519 sq. mi., providing an 8-mile buffer from infested to non-infested sites to the north/northeast and 6-mile buffer to the east, and extending south to the California border.
- The Kitsap County, WA botanical garden had a new *P. ramorum*-positive *Rhododendron* confirmation, from the same vicinity of the garden as all of the other hosts that have been found positive since March. The rhododendron and

surrounding plants have been destroyed and steam treatment of the soil is underway.

- Trace-forward investigations from a WA nursery identified 8 *P. ramorum* positive plants at a Humboldt County nursery. All infested plants were destroyed and follow-up inspections were negative.
- A Critical Control Points (CCP) Assessment of the *P. ramorum*-positive Kitsap County botanical garden was performed. After the detection of *P. ramorum* on a *Pieris* plant at the garden in April 2015, a delimitation survey found 10 other plants in the same general area that were *P. ramorum* positive: rhododendron (3), viburnum (3), pieris (1), camellia (1), mahonia (1), and vinca (1). All positive plants and nearby host plants have been destroyed.
- The Los Padres National Forest will be implementing a Sudden Oak Death mitigation and management plan for the Botchers Gap, Nacimiento, and Ponderosa campgrounds. All dead and hazardous oak and tanoak trees will be removed and chipped; all California bay laurel and live tanoak trees will be removed, and the stumps will be treated with herbicide to prevent resprouting. Work is planned to begin in Fall 2015, with over 200 trees (most less than 2 ½ m tall) slated for removal. In all, 24 acres will be treated.
- The British Forestry Commission's 2015 Japanese larch *P. ramorum* aerial survey continued, finding suspect trees along the southwest edge of the *P. ramorum* management zone. Within the management zone, spread appeared to be limited, even in areas that have had high infection levels over the past 2 years.

## 06/15

- Five new *Phytophthora ramorum* hosts were detected in February on Marin County Municipal Water District property: *Arctostaphylos virgata*, *Arctostaphylos glandulosa*, chinquapin (*Chrysolepsis chrysophylla*), blackberry (*Rubus ursinus*), and chaparral pea (*Pickeringia montana*).
- A Kitsap County botanical garden had additional *P. ramorum* positive plants found in May during a delimitation survey. All infected plants were destroyed and trace-back investigations are underway.
- *Vaccinium parvifolium* (red huckleberry) was found *P. ramorum* positive for the first time from two samples taken at a Lewis County, WA interstate shipping nursery during their 2015 spring Federal *P. ramorum* Certification Program survey.
- From January 1 to June 3, 2015, *P. ramorum* was reported in 10 nurseries (OR 8, WA 1, VA 1), one commercial landscape (LA), and a botanical garden (WA) in non-quarantine areas. *P. ramorum* was detected in *Camellia* (2), *Kalmia* (1), *Mahonia* (1), *Osmanthus* (1), *Pieris* (10), *Rhododendron* (40), *Viburnum* (4), *Vinca* (2), and soil samples (8).
- All seven California nurseries participating in the 2015 Federal *P. ramorum* Certification Program were negative for *P. ramorum*. Forty-seven nurseries in the quarantined counties also completed their annual inspection and all were negative for the pathogen.

- Fourteen native plant nurseries have joined the CDFA BMP for Ornamental and Native Plant Nurseries, joining 14 ornamental nurseries already participating.
- The Oak Phosphonate Application Recommendations for Sudden Oak Death were revised.

#### 05/15

- Fifty-one dead tanoaks were identified during a helicopter survey of the Curry County, Oregon quarantine area on May 6. Thus far in 2015, 11 new infestations have been confirmed outside of the Generally Infested Area. The GIA was expanded slightly to 58 sq. mi. in 2014 because of the large infestations along its northern edge. There has been no further expansion thus far in 2015; however, the Oregon Department of Agriculture is considering expanding the Curry County *P. ramorum* quarantine area. With the proposed expansion, the quarantine area would increase from 264 sq. mi. to 519 sq. mi. and would provide a buffer from infested sites approximately 8 mi to the north/northeast and 6 mi to the east. The new quarantine area would also extend south to the California border.
- *Phytophthora ramorum* has been detected in 4 of 10 Oregon nursery locations participating in the Federal *P. ramorum* Certification Program. In addition, 3 of 5 nurseries that opted out of the Federal Certification Program in 2014 have been surveyed, with pathogen detections in 2 of these nurseries.
- Two Puget Sound, WA residential landscapes were sampled as part of a *P. ramorum* trace-forward investigation from an out-of-state nursery; all samples were negative.
- A mature *Pieris* plant at a Kitsap County, WA botanical garden was found *P. ramorum* positive.
- California has completed inspecting 6 of the 7 nurseries participating in the Federal *P. ramorum* Certification Program, with all sampled nurseries negative for the pathogen. Forty-seven nurseries in the quarantined counties have also completed their annual inspection, with all negative for the pathogen (to date). A total of 2,464 plant, water, and soil samples have been analyzed from CA nurseries so far.
- Two Washington waterways in Kitsap and Thurston Counties have been found positive for *P. ramorum*. Both waterways have been positive in previous years and are downstream from previously positive nurseries.

#### 04/15

- APHIS issued a Federal Order on 4/3/15, expanding the area federally quarantined for *P. ramorum* in California to include Trinity County. Consequently, all interstate movement of *P. ramorum* regulated articles from Trinity County must be done in accordance with any applicable provisions of the Federal Order and the regulations promulgated pursuant to the Plant Protection Act found at 7 CFR 301.92 *et seq.*

- From January 1-March 25, 2015, *P. ramorum* was reported in six nurseries (OR) and one commercial business site (not a nursery; LA) throughout the US in non-quarantine areas.

### 03/15

- Washington received *P. ramorum* positive-plant shipments from three out of state nurseries in March.
- The 2014 Farm Bill awarded roughly \$796,717 in *Phytophthora ramorum*-related program funding to 19 states for the 2015 federal fiscal year. California received \$109,000 for survey efforts, confirming the pathogenicity and host range of the pathogen, and assessing disinfectants for *P. ramorum* control. The NORS-DUC site received separate funding of \$474,303.
- Sudden oak death has been confirmed for the first time in Montgomery Woods State Park, Mendocino County, on California bay laurel and tanoak in a 1-acre area infestation. The nearest known infestation is approximately 1.3 miles east near Orr Hot Springs.
- Australia has issued a "Draft review of policy: importation of *Phytophthora ramorum* host propagative material into Australia." Proposed changes include updating the *P. ramorum* host list and adding additional hosts of *P. kernoviae*, *P. nemorosa*, and *P. pseudosyringae*; reducing the post-entry quarantine (PEQ) growth period for dormant cuttings and budwood; and allowing the importation of 1-year-old, bare-rooted plants without foliage.
- The 2014 National *P. ramorum* Early Detection Survey of Forests conducted stream surveys in CA, OR, WA, and 9 Eastern states. Positive samples were collected in CA (19), OR (6) WA (2), AL (4), FL (1), MS (2), and NC (2). Two of the positive streams (AL-1; FL-1) have not been previously positive and are each associated with a positive nursery; another Alabama positive stream has not been previously positive but is not associated with a positive nursery.
- In 2014, England, Scotland, and Wales had a significant reduction in the number of new larch infestations. Aerial surveys detected approximately 123.5 acres of newly infected larch outside of Scotland's southwest management zone, compared to 12,350 acres in 2013. The decline in new infection is attributed to drier conditions and landowner cooperation with early detection and rapid felling of infested trees.
- Shrub tanoak (*Notholithocarpus densiflorus* var. *echinoides*) was confirmed as a *P. ramorum* host by the UC Davis Rizzo lab in collaboration with UC Cooperative Extension-Humboldt/Del Norte.

### 01/15

- In 2014, 146 California waterways were monitored for *P. ramorum*. The pathogen was detected for the first time in six watersheds (Beaver, Butte, and Cooper Creeks in Humboldt County; and North Fork of the Big River, Chamberlain and Hare Creeks in Mendocino County). Overall, recovery from known positive watersheds was only 13 (54%) of 24 previously positive sites, likely because of low spring rainfall.

- Twenty-four Oregon nurseries participated in the USDA APHIS certification program in 2014, resulting in a total of 8 pathogen detections from plants, used pots, potting media, and water sources. Of the eight positive nurseries identified, 4 opted out of, or were removed from, the federal program and are now subject to Oregon's state quarantine requirements for *P. ramorum*, which includes mandatory testing to ensure there is no intrastate movement of the pathogen from these locations. The other 4 are currently operating under modified compliance agreements that include mandatory BMPs to address specific hazards at their nurseries. Seven nurseries tested pathogen free and continue to participate in the federal program.
- Native plant and restoration nurseries are joining the California Department of Food and Agriculture (CDFA) Best Management Practices (BMP) Program in response to detection of *Phytophthora tentaculata*.

#### 12/14

- So far in 2014, *P. ramorum* was reported in 19 nurseries in 3 regulated states (CA, OR and WA) and 4 non-regulated states (ME, NY, TX, and VA). Of the 19 positive nurseries, 8 were interstate shippers and 11 were non-interstate shippers.
- Twenty-three nurseries in CA, OR, and WA underwent the enhanced USDA APHIS compliance program to continue shipping host nursery stock interstate. Four of the 23 facilities no longer ship interstate; however, two nurseries were added to the compliance program due to *P. ramorum* confirmations, bringing the total number of participating nurseries to 21. A total of 8 nurseries in the program had *P. ramorum* detections this year.
- So far in 2014, California has had one *P. ramorum*-positive nursery identified in Sacramento County. A total of 13,839 samples were taken from nurseries statewide but many of those were prior to the USDA Animal and Plant Health Inspection Service (APHIS) March 2014 rule change that only previously positive nurseries and interstate shipping nurseries within the quarantined area need to be inspected. Since the March rule, 3,360 samples have been taken from 7 previously positive nurseries.

#### 10/14

- SOD was confirmed in three new areas of Humboldt County: (1) approximately 13 miles northwest of Garberville (and 2 ¼ miles from the nearest known infestation in Mattole Canyon Creek watershed) along Grindstone Creek on private property that appears to have been a previous marijuana grow site; (2) along the Mad River, approximately 1.75 miles south of vegetation positives previously confirmed in December 2013; and (3) approximately 18 miles southeast of Eureka on private property along the N. Fork of the Yager Creek watershed (just over 2 miles southwest of a known infestation along the Mad River and at least 10 miles north of considerable pathogen activity along portions of Larabee Creek).
- Due to drier weather, 2014 had limited new confirmations of *P. ramorum* on larch in the UK. New areas, especially in England, seem to be associated with infected *Rhododendron ponticum* and bilberry (*Vaccinium myrtillus*) with most confirmations on individual or small groups of trees in close proximity to previously established outbreaks. Findings indicate quick and complete



treatments reduce new outbreaks but completing treatments over large areas remains challenging.

- Thus far in 2014, *P. ramorum* has been reported in 18 U.S. nurseries. Ten facilities are in regulated states (CA-1, OR-7, and WA-2) and eight are in non-regulated states (ME-1, NY-2, TX-1, and VA-4). Eight of the 18 positive nurseries were interstate shippers (CA1; OR-4; WA-1; TX-1; VA-1) and 10 did not ship interstate. The Confirmed Nursery Protocol was conducted in all nurseries.
- Eight nurseries and greenhouses have agreed to participate in a pilot project to test the processes and procedures developed by the Systems Approach to Nursery Certification (SANC) program to implement a systems approach to nursery stock certification. The grower facilities and state regulatory staffs from Pennsylvania, New Jersey, Georgia, Oklahoma, Wisconsin, Missouri, Washington, and Oregon will be participating along with support staff from Extension, AmericanHort, and the Society of American Florists.
- The 2014 SOD Blitz found unexpectedly high levels of *P. ramorum* in north Berkeley and Tilden Regional Park (Alameda County), Novato (Marin County), and Petaluma and Sonoma (Sonoma County). In eastern Santa Cruz County, a canyon on the San Benito County border was found positive, the easternmost report of SOD in California to date. A *P. ramorum*-positive redwood was also found in The Presidio (San Francisco County; National Park Service). Otherwise, drought conditions led to a reduction in the number of infected trees in southern Mendocino, northern Sonoma, and southern Alameda Counties, and the eastern S.F. Peninsula and Carmel Valley Village (Monterey County).
- In Oregon, 5 of 45 baited streams tested positive for *P. ramorum*, all from within the quarantine area. Ground surveys confirmed 34 newly infected trees, some of which are very close to or just beyond the quarantine boundary. As the pathogen has spread closer to the perimeter of generally infested area (GIA) and treatment funds are limited, the quarantine area will be expanded.
- Thirteen Oregon nurseries (one with two locations) opted into the Federal *P. ramorum* Certification Program, while three nurseries opted out; all 17 nursery locations were surveyed, with *P. ramorum* detected in five opt-in nurseries. The positive nurseries were located in Washington (2), Clackamas (2), and Lane Counties. After the sampling, two of the positive nurseries decided to opt out of the federal program. In addition to the opt-in nurseries, *P. ramorum* was detected in an opt-out nursery on plants and in soil substrate beneath positive plants. The USDA CNP was enacted and the delimitation survey identified additional positive plants. After treatment, a positive *Rhododendron* sp. was identified at the nursery during the 90-day quarantine hold period, requiring the CNP to be completed a second time. Two *P. ramorum*-positive plants were also identified at a non-regulated Columbia County nursery during an annual inspection; the nursery ships interstate and will be considered an opt-in nursery for future regulatory activities. *P. ramorum* was detected in a Coos County residential landscape infecting a plant that had been purchased and imported from a positive Washington nursery.

#### 09/14

- A second site in Redwood National Park was found positive for *P. ramorum*. The 5-acre site along the banks of Redwood Creek is approximately 2 miles downstream from the Bridge Creek infestation but it is not clear whether the outbreaks are connected.

#### 08/14

- SOD has been confirmed in a remote location of Redwood National Park (RNP) in northern Humboldt County. This new infestation is located approximately 11 miles north of the Redwood Valley SOD site, which is also located along Redwood Creek.
- The USDA-Forest Service aerial survey identified approximately 50,000 newly dead overstory tanoak along the northeast front of the southern Humboldt infestation, roughly doubling the number of dead trees found in the same area a year ago. Individual dead tanoak were also seen near Redwood Creek and Mad River though mortality is down by roughly 15% in the rest of Humboldt and Mendocino Counties. Mortality in the rest of the state is similar to or less than 2013 levels.
- Of the 360 samples from 11 states (AL, CA, FL, GA, MS, NC, NY, OR, PA, TX, and WA) participating in the 2014 National *P. ramorum* Early Detection Survey of Forests, seven were found *P. ramorum* positive (AL-3; FL-1; MS-2; NC-1). Six of the positives were from streams and associated nurseries that had previous positives. One AL waterway had not been previously positive and was not associated with a stream or nursery that had previously been found positive.
- New Zealand has implemented emergency regulations as of August 14th regarding importation requirements for cut flowers and foliage of *Gaultheria* spp. from Canada and the US to mitigate risks of *P. ramorum*.

#### 07/14

- One hundred forty-six sites in five counties were monitored throughout northern and central coastal California (monitoring was not conducted in the Sierra Nevada region, Sonoma, or San Benito Counties). Recovery was lowest in Monterey County, while confirmations in Humboldt and Mendocino Counties remained relatively high. *P. ramorum* was detected for the first time in six watersheds in Humboldt (Beaver Creek, Butte Creek, Cooper Creek) and Mendocino (North Fork of the Big River, Hare Creek) Counties.
- From 1/1/14-6/30/14, *P. ramorum* was reported in 13 nurseries in 3 regulated states (CA, OR and WA) and 3 non-regulated states (NY, TX, and VA). Of the 13 positive nurseries, 7 were interstate shippers (CA-1; OR-4; WA-1; TX-1) and 6 were non-interstate shippers. The TX interstate shipping nursery was positive due to plants received from a positive CA nursery; measures were adopted to mitigate the risk. Three of the interstate shippers had shipped in the previous 6 months. *P. ramorum* was detected in *Camellia* (17), *Pieris* (8), *Rhododendron* (15), *Viburnum* (31), *Gaultheria* (14), *Prunus* (1), *Syringa* (2), and *Vaccinium* (1) as well as potting media (1), standing water on soil (6), and water (10).

- Of the 23 nurseries participating in inspections under the newly revised *P. ramorum* regulatory framework, 4 in the regulated states (CA, OR, and WA) were found *P. ramorum* positive. Until June 2014, *P. ramorum* has been detected in only one interstate shipper located in TX (noted above). Since the positive plant was received by the nursery within 2 months of shipping and was detected during a trace-forward investigation, APHIS determined this to be a regulatory incident and fully mitigated during the Confirmed Nursery Protocol and quarantine period.

#### 06/14

- A new waterway in Kitsap County, Washington was found *P. ramorum*-positive twice from samples collected in March and May. The site is downstream from a previously positive nursery. Sixteen waterways in six counties were monitored in all for the pathogen from March to June (2014), with no other confirmations made.
- Since the revision of federal regulations in April 2014, *P. ramorum* has been detected at six interstate shipping facilities (CA-1, OR-4, and WA-1) and four retail nurseries (OR-1, WA-1, and VA-2). *P. ramorum* positives were detected on: *Viburnum* (29); *Gaultheria* (14); *Rhododendron* (14); *Pieris* (7); *Camellia* (5); water baiting (4); soil (3); *Syringa* (2); potting media (1); *Prunus* (1); and *Vaccinium* (1).
- Oregon has so far identified five *P. ramorum*-positive nurseries. One Marion County nursery is an intrastate (opt-out) shipper with infected *Pieris*, *Rhododendron*, *Leucothoe*, and *Viburnum*. The other four nurseries are interstate (opt-in) shippers in Tillamook (positive *Gaultheria* and *Rhododendron*), Washington (positive *Rhododendron* and used potting media), Clackamas (positive *Pieris* and retention pond water), and Lane Counties (positive *Rhododendron*).
- Two adaptive management projects in Big Sur coast live oak-dominated forests will use data from SOD Blitz sampling to test the efficacy of bay laurel removal. One project is in a small neighborhood, the other is along 500 meters of a trail at Pfeiffer Big Sur State Park. Bay trees will be mapped and tested for the pathogen, which will then allow managers to remove only *P. ramorum* positive trees acting as "hot spots" for dispersal.

#### 05/14

- California had one *P. ramorum*-positive interstate (opt-in) shipping nursery, at a Sacramento County facility during a compliance agreement inspection. The facility was also found positive in 2009, 2010, and 2011. Infections were found on *Camellia japonica*, *Syringa vulgaris*, and *Viburnum tinus*.
- The US Forest Service aerial SOD survey flew approximately 460,000 acres in San Luis Obispo County and portions of Monterey, San Benito, Fresno, and Merced Counties. Most mortality is likely due to drought but discrete areas within 10 miles of the coast will be ground checked for SOD. The Salmon Creek drainage in Monterey County, just over a mile from the San Luis Obispo County line, showed heavy mortality and will also be ground checked.

#### 04/14

- *P. ramorum* was detected in the Mad River watershed (Humboldt County) by the USDA Forest Service Aerial Survey in late summer, 2013 and confirmed

via a follow-up ground survey by UC Cooperative Extension Humboldt personnel in December, 2013.

#### 02/14

- CDFA confirmed SOD has been found in Trinity County, less than 600 yards over the Humboldt County line, in an 80-acre BLM parcel adjacent to the Six Rivers National Forest. Trinity County is now the 15th California county known to have SOD. CDFA has submitted and finalized an emergency regulation change adding Trinity County to California Code of Regulations 3700, Oak Mortality Disease Control. As a regulated county, Trinity will be required to follow state and federal quarantine guidelines for the disease.
- In 2013, 11 *P. ramorum* stream baiting sites were established in western Washington waterways, of which two were identified as positive - one in Clallam County and one in Thurston County. Eleven additional sites were repeatedly sampled in Clallam County as the source of the inoculum there is unknown; however, results to date have been negative or inconclusive.
- Five new positive waterways were identified during the 2013 National *P. ramorum* Early Detection Survey of Forests conducted by US Forest Service, Forest Health Monitoring and cooperating states. Assays were conducted at 104 stream sites in 12 states nationwide. *P. ramorum* was confirmed at two new sites in CA, two new sites in WA, and one new site in TX. Sites previously positive for *P. ramorum* were confirmed in AL, MS, NC, and TX.

#### 01/14

- USDA APHIS issued Federal Order DA-2014-02 on January 10, 2014 (implementation date of March 31, 2014). This Order requires an enhanced compliance program for high-risk nurseries while allowing nurseries without any positive pathogen detections in the last three years to be relieved of annual inspections and certifications.
- In 2013, the California Department of Food and Agriculture inspected 1,575 nurseries and processed 18,013 *P. ramorum* compliance samples. The pathogen was detected only once, on a *Loropetalum chinense* (5 gal) plant at one nursery (Gilroy, Santa Clara Co.) which was also positive in 2004 and 2005.
- The Oregon Department of Agriculture tested 22,550 samples from 552 grower sites for *P. ramorum* in 2013. *Phytophthora* species were detected at 238 of the sites surveyed with *P. ramorum* detected in 10 facilities. Two of the positive facilities that still have *P. ramorum* present in the native soil beneath infested plants have agreed to trial steam treatments of the infested soil to eradicate the pathogen.
- No new infested wildland sites were found outside of Oregon's 264 mi<sup>2</sup> expanded quarantine area though disease and mortality continue to intensify and spread within the Generally Infested Area (GIA).

#### 12/13

- In 2013, 136 California waterway sites distributed throughout Del Norte, Humboldt, Mendocino, Sonoma, Monterey, San Luis Obispo, and San Benito Cos. were monitored for *Phytophthora ramorum*. In Humboldt Co., *P.*

*ramorum* was detected in three new sites (Roaring Gulch, an upper tributary of Redwood Creek located in Redwood Valley; Widow White Creek near McKinleyville; and North Dobbyn Creek along the southwestern border of the Six Rivers National Forest); all monitored sites in Redwood National Park (save an exception on Redwood Creek) and Hoopa Valley and Yurok Tribal lands were negative. In Mendocino Co., positives were found in Hollow Tree Creek (a tributary of the South Fork of the Eel River); the North Fork of the South Fork of the Noyo River (SFNR); Peterson Gulch (a small tributary of the South Fork of the SFNR); and the Little North Fork of the Big River (LNFB). In Sonoma Co., multiple watersheds in the Kruse Rhododendron State Natural Reserve and Salt Point State Park were positive for *P. ramorum*, indicating extensive pathogen spread along this portion of the Sonoma coast. There were no new positive watersheds in Monterey Co., and all watersheds monitored in San Luis Obispo Co. were *P. ramorum* negative this year.

- The Washington Department of Natural Resources found *P. ramorum* in the Dungeness River (near Sequim on the Olympic Peninsula, Clallam Co.) and Woodard Creek (Thurston Co.) during water course monitoring in 2013.
- Washington identified six *P. ramorum*-positive nurseries in 2013. Of the 22 previously positive nurseries surveyed, four were found positive again for the pathogen. A retail garden center in Kitsap County with positive plants was also found to have infested runoff water and soil. A King County re-wholesaler was found to have positive soil as well as infected plants.

#### 11/13

- Effective November 27, 2013, USDA APHIS added *Gaultheria procumbens* to the list of host plants regulated for *P. ramorum*.
- The Republic of Korea issued a Notification of Emergency Measures Addendum to their *P. ramorum* Phytosanitary measures, adding *Gaultheria procumbens* to their list of regulated associated host plants. As of November 22, 2013, all imported *Gaultheria procumbens* from prohibited and regulated areas must have a phytosanitary certificate verifying the shipment was inspected and found free of *P. ramorum*.
- The USDA Forest Service sudden oak death aerial survey for 2013 identified more than 294,000 dead trees in California on approximately 47,500 acres, slightly less than 2012 totals.
- The Scottish government recently allocated nearly \$1.5 million to help tackle the outbreak of *P. ramorum* on Japanese larch in Scotland, following a major expansion of the disease in 2013. Up to 14,800 acres of larch are now likely infected and most trees in the Galloway area will likely need to be felled over the next 2-3 years. Eradication in Scotland is no longer considered achievable and focus has turned to containment efforts.

#### 09/13

- Oregon's "Generally Infested Area" (GIA), currently at 48 mi<sup>2</sup>, has had a large increase in the number of dead tanoak over the past year, creating hazardous conditions for wildfire and tree failure. As of September 2013, approximately 14 new infested sites were found outside of the GIA, but none were outside of

the quarantine area.

- *P. ramorum* continues to spread on Japanese larch in Wales with nearly 4,450 acres of new infection identified in 2013.
- *P. ramorum* detected infecting a *Parrotia persica* (Persian ironwood) plant in a Multnomah County, Oregon nursery during an annual compliance survey. This nursery was previously positive in 2010.

### 08/13

- Tanoak and California bay laurel trees were found *P. ramorum* positive on Jackson Demonstration State Forest (JDSF), confirming the pathogen's presence following positive stream sampling and a June 2013 USDA Forest Service Aerial Survey that identified suspicious tanoak mortality. The positive trees were identified in the North Fork of the South Fork (NFSF) of the Noyo River, adjacent to the remote Trestle Trail. The nearest known infestations are 10 miles northwest at MacKerricher State Park and Ingelnook.

### 07/13

- USDA APHIS issued Federal Order DA-2013-27 on 7/3/13 so that nurseries located in the regulated areas of California, Oregon, and Washington that do not contain nor ship host or associated plant nursery stock are no longer required to comply with 7CFR 301.92. This Federal Order does not change the requirements for *P. ramorum* host nurseries in the regulated areas and all interstate shipping nurseries located in quarantine areas, including those that contain only non-host nursery stock.
- To date this year, 17 nurseries in four states have been found *P. ramorum* positive: CA(1), OR(9), WA(6), and NY(1). Twelve are interstate shippers and 5 are retail establishments.
- USDA-FS PSW aerial surveys from 2013 show severe tanoak mortality in the Santa Cruz Mountains and along the coast in Sonoma, Marin and Monterey Counties, with the worst impacted areas in Jenner/Guerneville (Sonoma County) and Big Sur and Mill Creek (Monterey County). Less severe areas of tanoak mortality were seen in coastal Mendocino County; however, new pockets of mortality were seen in and near Fort Bragg. Intense coast live oak mortality was mapped in the Oakland hills (Alameda County) and east of Watsonville (Santa Cruz County), about 9 miles from the closest SOD confirmation. No tanoak mortality was observed in Del Norte County this year. The total number of acres and trees killed due to SOD in the surveyed area to date this year appear to be similar to 2012 levels, with approximately 257,000 trees killed across 39,600 acres.
- New *P. ramorum* confirmations on tanoak and California bay laurel trees are as close as 1.1 miles from the Six Rivers National Forest boundary and 1.7 miles from the Trinity County line.
- Early results from United Kingdom aerial surveys reveal significant new areas of *P. ramorum*-infected Japanese larch, particularly in Wales and southwest Scotland. Initial estimates include approximately 6,178 acres in Wales and 4,942 acres in Scotland, with approximately 988 new acres of infection in England.

### 06/13

- *P. ramorum*-positive water samples were identified at two new waterways in Washington, a river in Clallam County and a creek in Thurston County. The water positive in Thurston County was downstream from a previously *P. ramorum* positive nursery, while the Clallam County water positive was not.
- A Snohomish County, WA production nursery was found to have *P. ramorum*-positive *Viburnum tinus* and *Pieris japonica* on 6/20/13. The nursery was previously positive in 2011.

### 05/13

- *Rhododendron* plants found positive at a Lane County, OR retail nursery. This is a repeat find.
- *P. ramorum* was found at two Washington state nurseries (Thurston and King Counties) that sell to the landscape trade.

### 04/13

- The first *P. ramorum* culture-positive water sample was confirmed from Jackson Demonstration State Forest in April 2013 in the North Fork of the South Fork of the Noyo River and Peterson Gulch drainages. Parlin Creek, which tested PCR positive in 2012, remained negative for the pathogen via culturing techniques during the 2013 monitoring season. To date, no terrestrial vegetation samples collected in JSDF have tested *P. ramorum* positive.
- A Gilroy nursery (Santa Clara County) was confirmed positive for *P. ramorum* on a *Loropetalum chinense* (5 g) plant. This facility was previously positive in 2004 and 2005.
- Oregon had three *P. ramorum*-positive nurseries identified: a Clackamas County facility was found to have infected *Camellia*, *Gaultheria*, *Pieris*, *Rhododendron*, *Trachelospermum*, and *Viburnum*; and two Washington County nurseries were also found with *P. ramorum*-positive *Rhododendron* sp., *Magnolia grandiflora*, and *Viburnum* 'Pink Dawn.'
- The Kitsap County, Washington retail garden center found positive in March 2013 had a positive soil sample confirmed at the nursery in April 2013.

### 03/13

- Expansion and intensification of disease in late 2012 triggered a revision of Oregon's quarantine rule and increased the quarantine area to 264 mi<sup>2</sup>. The revised rule establishes a "Generally Infested Area" (GIA) within the quarantine boundary where *P. ramorum* treatment is no longer required. It also defines high-priority sites where eradication treatments are required and increases utilization of tanoak within the quarantine area, permitting it and other host plants to be transported out of the quarantine zone if they are from a disease-free area.

### 02/13

- A new positive waterway outside a Houston nursery was detected in February. This was the first new positive site of the 2013 survey year and the second

new site in the Houston area in the past three months. A second, separate positive was also obtained in February from a site first identified positive in December 2012.

- *P. ramorum* was found on Japanese larch (*Larix kaempferi*) in Glen Dye, east Scotland, for the first time in January. The outbreak is far from the nearest known infected larch, and is of concern because the pathogen had previously been confined to the west coast. In Scotland there are now 137 positive larch sites impacting approximately 1,038 acres.

### 01/13

- The 2012 National *P. ramorum* Early Detection Survey of Forests identified three new positive waterways in Georgia, Texas, and Washington, bringing to 15 the total number of known positive sites outside of the established disease range in CA and OR.
- Washington's 2012 *P. ramorum* early detection survey of forests resulted in four positive water confirmations, including a new location in a watershed sub-basin adjoining the Sammamish River, King County (which has been *P. ramorum* positive since 2007). The other three other locations were repeat positives.
- Thirty-three nurseries in eight states (CA, OR, WA, NC, ME, NY, PA. and IN) had *P. ramorum* confirmations in 2012 (up from 23 nurseries in 5 states in 2011), including 17 interstate shippers (16 in regulated states and 1 in NY) and 16 non-interstate shippers. Sixteen of the finds (48.5%) were first time detections (CA-3, OR-7, WA-2, NY-1, IN-1) and 17 (51.5%) were repeat nurseries. High-risk host plants comprised 85% of confirmations.
- California had seven *P. ramorum*-positive nurseries in 2012, of which four were previously positive. Five confirmations came from production facilities, two were retail, two were in the quarantine area, and five were in the regulated area.
- Oregon detected 11 positive nurseries as part of the 2012 Federal *P. ramorum* Certification Program. The pathogen was detected on plants, as well as in potting media, soil, and a cull pile. This was the first time *Gaultheria procumbens* had ever been found positive for the pathogen.

### 12/12

- As of 12/10/12, the USDA Animal and Plant Health Inspection Service (APHIS) amended the federal order (FO) regarding advance notification for interstate shipments of *P. ramorum* high-risk host nursery stock.

### 11/12

- SOD Blitz results from 2012 surveys show a spike in infection and establishment of *P. ramorum* in Bay Area urban residential areas, including Santa Cruz County, Carmel Valley Village (Monterey Co.), and in Golden Gate Park (San Francisco Co.) in a southwestern sector near Middle Lake, several miles from the previously infected site in the AIDS Memorial Grove. The East Bay infestation transitioned from a "newly arrived" status (in 2011) to epidemic levels on bay (in 2012), suggesting oak and tanoak infection in those areas are likely to increase. In total, the 2012 SOD Blitz surveyed over



10,000 trees throughout coastal Northern California via the help of more than 500 volunteers.

- To date this year, *P. ramorum* has been reported in 8 (CA, OR, WA, NC, ME, NY, PA, and IN) states and 33 nurseries, including 17 interstate shipping facilities (CA-2, OR-7, WA-7, NY-1; 10 nurseries did ship material out of state) and 16 non-interstate shipping nurseries (CA-4, OR-4, WA-3, NC-1, ME-1, NY-1, PA-1, IN-1). Forty-seven percent (15) of the finds were first time detections (CA-3, OR-7, WA-2, NY-1, IN-1) and 48 percent (16) were repeat nurseries. In total, 10 trace investigations have been implemented. Host plants from *P. ramorum*-positive nurseries were shipped to 33 states, with positive finds in 2 (ME, PA traced-back to OR) non-interstate shipping nurseries and four residential locations. Of the four (ME, OR, WA, CA) residential confirmations, two (ME, CA) were traced back to a nursery in OR and two (OR, WA) were traced back to a WA nursery.

## 09/12

- Japanese larch (*Larix kaempferi*) trees were found infected with *Phytophthora ramorum* in Southeast England for the first time. The Forestry Commission has issued statutory "plant health notices" to the affected owners, requiring them to fell the infected larch trees and others nearby.
- In May and June 2012, *P. ramorum* was again recovered from the Mattole River, east and west forks of the Canyone Creek, Gridnstone Creek, and an upper tributary of Grizzly Creek (Humboldt County).
- The USDA Forest Service annual California aerial detection survey mapped 376,000 dead oak and tanoak over 54,000 acres in areas impacted by SOD in California in 2012. In comparison, 38,000 trees across 8,000 acres were mapped in the same area last year.
- A residential site in Placer County, California (regulated county) was found to have a *P. ramorum*-positive *Rhododendron* sp. plant on August 28th. The positive plant was traced back to a retail nursery in Auburn (Placer County), which was confirmed *P. ramorum* positive in 2006 and 2009.
- To date in 2012, the US has had 32 *P. ramorum*-positive nurseries in seven states (CA-6; OR-11; WA-10; NC-1; ME-1; NY-2; PA-1) as well as 4 positive residential/ landscape detections (CA, OR, WA, ME). Positive plants included: *Rhododendron* (51%); *Camellia* (13%); *Viburnum* (11%); *Pieris* (7%); *Kalmia* (3%); *Gaultheria* (4%); *Loropetalum* (3%); *Magnolia* (3%); *Hamamelis* (2%); *Cornus* (1%); *Prunus* (1%); and *Trachelospermum* (1%). Seventeen of the positive nurseries are interstate shippers (CA-2; OR-7; WA-7; NY-1) and 15 are retail facilities (CA-4; OR-4; WA-3; NC-1; ME-1; NY-1; PA-1). Collection ponds were positive at 2 retail nurseries (WA, NY) and 3 that ship interstate (2-WA, 1-NY). Soil was positive at 1 retail nursery (CA), 2 interstate shipping nurseries (CA, OR), and 1 landscape site (WA). Ten interstate trace-forward investigations were conducted this year: three with potentially infected plants shipped to 24-30 states and seven with potentially infected plants shipped to 1 to 3 states. As a result, *P. ramorum* was detected at retail nurseries in ME and PA that were shipped from OR, and from three residential/landscape sites in OR, WA, and ME that originated in WA.

## 08/12

- A *Phytophthora ramorum* outbreak has been identified on the Rogue River-Siskiyou National Forest 10 miles east of Brookings, OR. The site is ½ mile east of the current quarantine boundary; therefore, an emergency quarantine was put into effect, bringing Oregon's Sudden Oak Death (SOD) quarantine area to 229 square miles. Approximately 50 acres are being treated.
- California's 2012 USDA Forest Service annual aerial detection survey has flown 20.1 million acres, finding over 318,000 dead oak and tanoak trees across 56,200 acres, mainly in areas impacted by SOD and Goldspotted Oak Borer. SOD-related mortality has increased dramatically from 2011 with more than 315,000 dead tanoak mapped over 45,000 acres.
- To date this year, the Oregon Department of Agriculture (ODA) has confirmed 11 *P. ramorum*-positive nurseries in Clackamas, Curry, Lane, Lincoln, Marion, Multnomah, Polk, Tillamook, and Washington Counties. The positive plants found in the Curry County nursery (now closed for business) were infected with the EU1 lineage. No infected plants were found at the nursery during inspection last year; however, 13 infected plants were found this year. This is the first report of the EU1 lineage in Curry County. *P. ramorum* was also detected at a private residence in Lane County (Oregon) based on trace-forward information received from USDA APHIS. The pathogen was detected infecting *Gaultheria shallon* and *G. procumbens* plants that had been imported from Washington and were still in their containers.
- A "National Framework for Managing Sudden Oak Death (SOD) caused by *Phytophthora ramorum* in Forests and Wildlands" has been developed by the USDA Forest Service, Animal Plant Health Inspection Service, National Association of State Foresters, and the National Plant Board. The framework links various levels of government, non-governmental groups, and private stakeholders to address the potential impact of SOD in forested landscapes should it be detected outside the current quarantine area.

## 07/12

- A fourth, genetically distinct lineage of *Phytophthora ramorum* has been discovered in the United Kingdom on Japanese larch. Based on genetic analysis, it is believed that the previously unknown European type 2 (EU2) lineage has been newly introduced into southwest Scotland and Northern Ireland. The pathway by which the new lineage arrived into the UK is unknown, and researchers are assessing the extent of its distribution. Genetic analysis of the four lineages (EU2, EU1, NA2, NA1) indicates that the pathogen emanates from some unknown center of origin.

## 06/12

- Four California nurseries were found *P. ramorum* positive – two within the quarantine area (both Mendocino County) and two within the regulated area (both Sacramento County). The first confirmation was a Mendocino County retail nursery that was found to have a positive *Camellia* during a general nursery inspection. The nursery was also positive in 2008, 2010, and 2011; is

not under compliance; and does not ship interstate. The second confirmation was made on a positive *Camellia* during a compliance agreement inspection at a Mendocino County production nursery. The nursery has not previously been positive and does not ship interstate. Following the confirmation, the facility chose to no longer participate in the *P. ramorum* host interstate shipping program. A *Viburnum tinus* 'Spring Bouquet' at a Sacramento County production facility during a compliance agreement inspection. The nursery was also found positive in 2005, 2006, 2007, and 2011, and does ship interstate (to Nevada). The fourth confirmation was at a Sacramento County retail nursery during a compliance agreement inspection. Positive plants included a *Rhododendron* sp. 'Boule de Neige' and a *Camellia japonica* 'Pink Parade.' The Nursery does not ship interstate and has not previously been positive.

- The Oregon Department of Agriculture 2112 Federal Order survey of nurseries shipping interstate is about 50 percent complete. To date, 7,841 samples have been analyzed, with nine nurseries (5 grower and 4 retail) in Clackamas, Lane, Lincoln, Marion, Polk, Tillamook, and Washington Counties found positive. Four of the nurseries ship interstate and four are repeat positives. Nursery stock found infected includes *Camellia*, *Cornus*, *Hamamelis*, *Kalmia*, *Magnolia*, *Pieris*, *Rhododendron*, and *Viburnum*.
- Washington has had 10 confirmed positive nurseries to date in 2012, the most in a single year since 2006. Counties with detections include King, Pierce, Thurston, Lewis, Clark, Clallam, and Skagit. Eight of the nurseries are repeat positives and six are certified interstate host shippers, three of which have shipped host and associated host plant material in the past six months. Positive plants have included *Rhododendron*, *Viburnum*, *Camellia*, *Magnolia*, two *Pieris*, and one *Gaultheria*.
- As of June 8, 2012, the Republic of Korea's Animal, Plant, and Fisheries Quarantine and Inspection Agency, Ministry for Food, Agriculture, Forestry, and Fisheries added six countries (Croatia, Czech Republic, Greece, Finland, Lithuania, and Serbia) to their "Phytosanitary measures to prevent the introduction of Sudden Oak Death Disease." These countries now must abide by the Republic of Korea's rule applying to any propagated host or associated host material such as nursery stock (including root stock), cuttings, and scions (except seeds and fruits) and wood (including logs) with bark. All shipments will be required to have phytosanitary certificates accompany *P. ramorum* host and associated host importation, with an additional declaration that, "The shipment was inspected and found free of *Phytophthora ramorum*."
- A new *Phytophthora ramorum* wildland infection has been identified on the Rogue River in the Siskiyou National Forest. It is the first infection site in the Winchuck River drainage, approximately 6 miles southeast of previously identified infection sites and about one half-mile outside the current Oregon Sudden Oak Death quarantine boundary.
- In Galloway, southwest Scotland, a cluster of suspected new *P. ramorum*-positive larch sites totaling more than 247 acres has been found. The site is distant from the nearest previously infected site. Only three confirmed sites have been previously recorded in Scotland.

- The Oregon Department of Agriculture 2012 Federal Order survey has identified six *P. ramorum*-positive nurseries so far this year in Lincoln, Marion, Washington, Tillamook, Polk, and Lane Counties. Three of the positive nurseries are wholesalers and three are retailers. Two of the six ship nursery stock out of state and four are repeat positives.
- Of the \$15.5 million allocated to California in 2012 via the 2008 Farm Bill - Section 10201, \$978,745 has been awarded for *P. ramorum* projects related to safeguarding nursery production and enhancing mitigation capabilities.

## 05/12

- Three Washington nurseries were confirmed positive for *P. ramorum* in May during interstate shipper annual compliance inspections. One was a wholesale producer with an attached retail yard in King County; the second was a Clallam County retail nursery with a separate production site; and the third confirmation was from a mail-order retail nursery in Lewis County which had a positive potentially actionable suspect sample in 2010 and tested negative in 2011.
- In Washington, holding pond water was found positive at two wholesale landscape nurseries – one in Clark County and the other in Thurston County. Both ponds have been positive in past years; clean-up has been difficult. Neither site uses the ponds for irrigation. Positive rhododendrons were also found in a commercial landscape in Pierce County. These plants were traced forward from the *P. ramorum*-positive wholesale landscape nursery in Thurston County (found positive 3/30/12).
- On May 3, 2012, a 5-gallon *Loropetalum chinense* 'Rubrum' was confirmed *P. ramorum* positive at a retail nursery in Sacramento County as a result of a follow-up inspection for a 2011 confirmation. The nursery is not under compliance and does not ship interstate.
- USDA APHIS issued a Federal Order on April 18, 2012, placing restrictions on the importation of *P. ramorum* host plants for planting into the U.S. The new order requires specific countries to have in place an annual pest exclusion program that incorporates monitoring, sampling, testing, and a validation process to verify the absence of *P. ramorum* in places of production.
- California's first *P. ramorum*- positive nursery for 2012 was identified on April 13th. The Orange County production nursery was found to have infected *Loropetalum chinense*, *Rhododendron*, and star jasmine (*Trachelospermum jasminoides*) during a compliance agreement inspection. The nursery ships interstate and had not been previously positive for the pathogen.

## 04/12

- On April 27, 2012, a San Joaquin County production nursery was found to have 5-gallon *P. ramorum*-positive *Camellia sasanqua* 'Cleopatra,' *Camellia japonica* 'Mathotiana Supreme,' and *Camellia japonica* 'Bella Rose' during a compliance agreement inspection. The nursery was previously positive in 2011 and has not made any interstate shipments since.

- *Phytophthora ramorum* was recovered from three native California plant species: *Cornus nuttallii* (western dogwood), *Trillium ovatum* (western wake robin), and *Garrya elliptica* (wavyleaf silk tassel). Koch's postulates still need to be performed to demonstrate that *P. ramorum* is causing disease in these three plant species, but the recoveries in 2011 are the first findings of the pathogen in members of the *Trillium* and *Garrya* genera. Several ornamental species of *Cornus* (*C. kousa* and the hybrid *C. kousa* x *C. capitata*) are already on the list of associated *P. ramorum* hosts, but the recovery of the pathogen from *C. nuttallii* marks the first instance of recovery from a North American dogwood species.

### 03/12

- Effective March 1, 2012, the USDA Animal and Plant Health Inspection Service will add eight plants to the list of *P. ramorum* associated hosts: *Ilex cornuta* (Buford holly, Chinese holly, horned holly); *Illicium parviflorum* (yellow anise); *Larix kaempferi* (Japanese larch); *Magnolia denudate* (lily tree); *Mahonia nervosa* (creeping Oregon grape); *Molinadendron sinaloense*; *Trachelospermum jasminoides* (star jasmine, Confederate jasmine); and *Veronica spicata* Syn. *Pseudolysimachion spicatum* (spiked speedwell). In addition, APHIS is moving *Cinnamomum camphora* from the associated host list to the proven and restricted host list. These changes bring the official U.S. *P. ramorum* host list to 137 plants. As of March 1, 2012 any nurseries within the regulated and quarantined areas containing these newly listed plants must be properly inspected, sampled, and tested in order to be able to move any plants interstate.

### 01/12

- Stream monitoring in Humboldt County resulted in several new *P. ramorum* detections in 2011. Larabee Creek, a tributary to the main stem of the Eel River, and Grizzly Creek, a tributary to the Van Duzen River, both tested positive for *P. ramorum* in the spring of 2011. Four sites within the Mattole River watershed of southern Humboldt County (Mattole Canyon Creek, Crooked Prairie Creek, and Mattole River at Ettersburg Bridge and at Whitethorn) were also found *P. ramorum* positive. The pathogen was also isolated from California bay laurel along Fire Creek (further up the Blue Slide Creek watershed from Crooked Prairie Creek) in spring 2011.
- Three new *P. ramorum*-positive locations were identified in Washington via the 2011 *P. ramorum* early detection survey of forests: a stream that feeds into the Sammamish River (which has been *P. ramorum* positive since 2007); a watershed sub-basin adjoining the Sammamish River; and a Lewis County stream in a forested area. None of the finds were in association with streamside plant infections.
- In 2011, the California Department of Food and Agriculture detected *P. ramorum* in 12 nurseries as a result of compliance, trace-back, and nursery stock cleanliness inspections.
- The Oregon Department of Agriculture detected *P. ramorum* in six nurseries in 2011, infecting *Rhododendron*, *Viburnum*, *Camellia*, and *Pieris* plants. The

pathogen was also detected in the soil substrate at one nursery, the soil substrate and potting media associated with an infected plant at another nursery, and in potting media associated with infected plants at two other nurseries. Four of these six nurseries were positive for *P. ramorum* in previous years.

- A *P. ramorum*-positive site was confirmed in Mendocino County a few miles north of MacKerricher State Park near Inglenook. This location is now the most northern coastal infestation in the county.
- *Molinadendron sinaloense* was found to have *P. ramorum* symptoms in August by a county inspector. It was confirmed to be *P. ramorum* positive by USDA and classified as an associated host on January 25, 2012.

### 09/11

- *P. ramorum*-positive Camphor (*Cinnamomum camphora*) trees were confirmed in Mill Valley, Marin County for the first time in a neighborhood setting, though it has been listed as an associate host since being identified in nurseries in 2006. Appearing to be more susceptible than previously thought, symptoms include leaf lesions, branch tip dieback, and stem cankers. It is believed that the pathogen moved from the forest into the urban setting.
- A new *P. ramorum*-positive site six miles north of the quarantine boundary was found in Curry County, OR. The infested two tanoak trees are in Cape Sebastian State Park, over 12 miles from the nearest known infected tree.
- SOD increased dramatically in areas surveyed during the spring 2011 fourth annual SOD Blitz, with up to a three-fold increase in infection levels compared to 2010 data. The citizen science project found higher than expected infection levels in the San Francisco Peninsula and East Bay, as well as confirming for the first time that the pathogen is present in Carmel Valley Village and the valley floor of Napa Valley.
- The USDA APHIS *P. ramorum* Program 2011, 3rd Quarter Summary reported 25 nursery-related *P. ramorum* confirmations from January to September 30, 2011 in the following states: CA(12), OR (6), WA (5); SC (1); and CT (1 residential). Fourteen of the nurseries were interstate shippers and nine were retail. Positive plant detections were from the following plant species: Camellia (31%); Rhododendron (34%); Pieris (5%); Viburnum (5%); Magnolia (5%); Osmanthus (3%); Gaultheria (3%); Cinnamomum (3%); and 7 other species (11%).

### 08/11

- *Molinadendron sinaloense* was found *P. ramorum* positive for the first time on 6/30/11 during a routine light brown apple moth (LBAM) inspection at a research garden in Alameda County, CA. The sample was confirmed positive by the USDA Animal and Plant Health Inspection Service (APHIS) on 8/1/11.

### 07/11

- Great Britain had three new *P. ramorum*-infested Japanese larch tree outbreaks, in Lancashire County, Cumbria County, and Mull Island (Scotland).
- A Sacramento County, CA production nursery was found positive for *P. ramorum*. To date in 2011, *P. ramorum* has been confirmed in 21 US nursery locations: CA (11), OR (6), WA (3), and SC (1) as well as one residential location in CT.

## 06/11

- The Forest Service detected almost 4,000 acres of tree mortality in Northern California during their annual aerial survey. Mortality was primarily due to Sudden Oak Death and was focused mostly in Sonoma County.
- Washington State had two new and one repeat *P. ramorum*-positive waterway detections, all near the Sammamish River.
- The UK confirmed a new *P. ramorum*-infested Japanese larch site in the previously uninfested region of Derbyshire County, central England.
- California had two *P. ramorum*-positive in production nurseries, one in Mendocino County and another in San Joaquin County.
- The USDA Animal and Plant Health Inspection Service (APHIS) updated regulations governing international trade in plants used in gardening and landscape design (effective June 27, 2011). The rule change creates a new category, "Not Authorized for Importation Pending Pest Risk Assessment (NAPPPRA)," which allows APHIS to quickly restrict the importation of plants suspected of being invasive or carrying pests until possible risks are understood and protective measures are put in place.

## 05/11

- Washington had two repeat *P. ramorum*-positive waterway detections; each stream feeds into the Sammamish River and the inoculum source for each is unknown.
- The British Forestry Commission completed seven *P. ramorum*-infested larch woodland survey flights this year in Wales and England's southwest, South Coast, and Peak District with flyovers detecting fewer suspected infected larch than the previous two years.
- California had four *P. ramorum*-positive nurseries confirmed, in San Joaquin (1 production nursery), Santa Cruz (1 production nursery), and Sacramento (1 retail and 1 production nursery).
- A wholesale/production nursery in Snohomish County, Washington was confirmed *P. ramorum* positive on May 27<sup>th</sup> during an Annual Compliance Inspection.
- The Oregon Department of Agriculture completed testing for the 2011 *P. ramorum* Federal Order Survey on 7,574 samples collected from 182 nursery grower locations. Four Oregon nurseries were found positive for the pathogen

in May (2 wholesale nurseries in Clackamas County, a retail nursery in Lincoln County, and a wholesale nursery in Lane County).

- The Washington *P. ramorum*-positive soil confirmation in a Gig Harbor, Pierce County landscape (confirmed December 2010) has been identified as the NA2 lineage. This is the first time this strain has been found outside of a nursery in soil.

#### 4/11

- A South Carolina retail nursery was found to have *P. ramorum*-positive soil on April 6<sup>th</sup>. Clemson University and the nursery owner are working to clean up the site and will soon be installing a sand filtration system in an effort to keep pathogen spores from entering the environment.
- A Sitka spruce (*Picea sitchensis*) tree has been found *P. ramorum* positive in the Republic of Ireland. This is the first field record worldwide of *P. ramorum* infection in Sitka spruce; however, it had previously been found susceptible in laboratory tests. Noble fir (*Abies procera*), beech, and Spanish chestnut (*Castanea sativa*) growing in close proximity to infected Japanese larch have also been found *P. ramorum* positive at a number of the sites. This is also the first report of *P. ramorum* infection on Noble fir.
- European larch (*Larix decidua*) has been found *P. ramorum* positive in a woodland near Lostwithiel, Cornwall, in southwest England in an area with infected Japanese larch trees. This is the first time European larch has been found naturally infected with the pathogen.
- To date, approximately 2 million Japanese larch (*Larix kaempferi*) trees have been felled in the UK in response to the *P. ramorum* outbreak. Since first identified as a host in August 2009, larch has been found infested in southwest England, Wales, Scotland, and the Isle of Man, and at nine sites in Northern Ireland.
- *P. ramorum* has been confirmed in a Lawson's cypress (*Chamaecyparis lawsoniana*, called Port Orford-cedar in its native range) and on rhododendron at Balloch Castle Country Park on Loch Lomondside in West Dunbartonshire, Scotland where *P. lateralis* was confirmed in Lawson's cypress late in 2010 (the first time *P. lateralis* had been identified in Britain). The park is only the second site in Scotland where *P. ramorum* has been found in trees. Researchers now believe that the cause of the cypress and yew (*Taxus brevifolia*) decline at the park is *P. cinnamomi*. While *P. lateralis* and *P. ramorum* are genetically closely related, this is the first time they have been found in such close proximity.

#### 3/11

- The NA2 *P. ramorum* genotype has been detected in retail nurseries in five California counties. Originally only confirmed in Sacramento County in 2005, it has since been found there in 2008 and 2009. It has also been found in San Mateo (2008), Contra Costa (2009), Placer (2010), and Sonoma (2010) Counties.



- The USDA Animal and Plant Health Inspection Service (APHIS) will implement a Federal Order on 3/1/11 requiring interstate shipping nurseries in *P. ramorum* quarantine areas or in regulated counties that have previously tested positive for the pathogen to provide advance notification to destination states in non-regulated areas for certain high-risk plant species. Advanced notification is intended to enhance the traceability of potentially infected nursery stock. Under the new requirements, all nurseries located in a quarantine area that ship any species of *Camellia*, *Kalmia*, *Pieris*, *Rhododendron* (including Azalea), and *Viburnum* interstate to non-regulated areas must provide advance notification. In addition, nurseries shipping any of these species interstate to non-regulated areas must provide advance notification if they are located in regulated counties with one or more interstate shippers that have tested positive for *P. ramorum* since 2003.
- [An amendment has been made to the January 28, 2011 Federal Order \(DA-2011-04\)](#) requiring advance notification for certain shipments of *P. ramorum*- host nursery stock. The counties of Santa Barbara (CA), Ventura (CA), Lincoln (OR), and Kitsap (WA) have been removed from the list of affected counties. This action was taken because Santa Barbara and Ventura Counties only detected *P. ramorum* on trace-forward plants and not on host plants grown within the interstate shipping nursery premises; Lincoln County has no *P. ramorum*-positive interstate shippers; and Kitsap County does not have an interstate shipping nursery that has previously tested positive for the pathogen. The amended Federal Order is immediately effective and supersedes the Federal Order dated January 28, 2011 (DA-2011-04). All other counties listed in the January 28 Federal Order (DA-2011-04) as an affected quarantined and regulated county in California, Oregon, and Washington remain the same.

## 2/11

- The California Board of Forestry and Fire Protection passed an interim emergency regulation for Sudden Oak Death at their January 2011 meeting. The rule defines an Emergency Condition (under 14 CCR §1052.1) and specifies the location, treatments, and environmental protection measures related to the removal of live and dead hardwood trees or vegetation infected by or susceptible to Sudden Oak Death.

## 1/11

- Fifteen *P. ramorum*-positive water samples were confirmed in Washington state in January 2011. A nursery in Cowlitz County, Washington that has had *P. ramorum*-positive water onsite since 2008 has been found to have a new positive water location on the southeast corner of the nursery along a county road right of way. The new location drains into two separate small streams.

## 12/10

- A Gig Harbor, Pierce County, WA landscape site adjacent to a previously positive repeat nursery has been found to have *P. ramorum*-positive soil. The confirmed site is along a drainage that had been found positive with infected salal plants in the summer of 2009.

- *P. ramorum*-infected Japanese larch trees were confirmed in Scotland for the first time in December 2010. The finding was made in a forestry plantation on the west coast of Scotland (Craignish Peninsula, Argyll).
- Northern Ireland's Glenariff Forest Park was found to be *P. ramorum* positive after an aerial survey, bringing the total number of infested sites in Northern Ireland woodlands to eight. The find is the first in a forest park situation for Northern Ireland.
- California had 874 establishments under compliance for *P. ramorum* in 2010, including 634 host nurseries. A total of 18,418 samples were taken in California nurseries, with 2,090 nursery sites found to be negative for the pathogen and eight sites found positive. Five of the confirmed locations were production facilities, two were retail sites (both in quarantined counties), and one was a residential location (regulated county).
- Nurseries identified as *P. ramorum* positive throughout the US in 2010 included: CA (7); OR (9); WA (6); IA (1-Trace Forward); IL (1-Trace Forward); AL (1); NC (1); SC (1); VA (1-hoop house leaf debris); NY (1-Collection Pond), MS (3); GA (1-irrigation pond); PA (1-greenhouse seeding flats). Confirmations by plant genera included: *Rhododendron/Azalea* (41); *Camellia* (18); *Viburnum* (7); *Pieris* (6); *Kalmia* (2); *Laurus nobilis* (3); *Loropetalum chinensis* (1); *Magnolia* (2); *Tracheolosperrum jasminoides* (2); *Osmanthus fragrans* (1); *Mahonia nervosa* (1); *Sequoia sempervirens* (1); and *Veronica spicata* (1). There were two positive residential landscape detections and one water-pond positive. Eighteen of the infested nurseries were interstate shippers and 13 were retail facilities. Subsequent plant and soil samples taken in each of the nurseries were all negative for *P. ramorum*.

## 11/10

- Northern Ireland has confirmed seven *P. ramorum*-infected Japanese larch sites in woodlands on the southern half of the Antrim plateau and one in Mid Down. Approximately 268 hectares of public land and six hectares of private land are affected. Aerial and ground surveys (completed this fall) have confirmed that the infected larch is confined to a cluster of sites in south Antrim and an isolated site in County Down. To date, 79 hectares of Japanese larch woodland have been felled.

## 10/10

- The northern Humboldt County Redwood Creek watershed *P. ramorum* infestation appears to be restricted to one discrete location centered near the community of Redwood Valley. The pathogen has been detected on symptomatic tanoak, California bay laurel, huckleberry, and Douglas-fir. While its effects on the latter three appear to be negligible, it is killing tanoaks in all size classes, including very large ones that are undetectable from the air because of the density of the Douglas-fir and redwood canopy in that location. Genetic work confirmed that the pathogen is of the North American (NA1) lineage.

- *P. ramorum*-infested Japanese larch (*Larix kaempferi*) has been confirmed at 68 southwest England plantations. Larch plantations with similar symptoms were also discovered in south Wales where *P. ramorum* was also isolated at multiple sites. Overall an estimated 600,000 mature larch over 2400 ha have been affected to date in the United Kingdom, with a large area of juvenile larch also affected. This is the first widespread and lethal damage caused by *P. ramorum* to a conifer and the first to a commercial plantation tree. Adjacent to some affected larch sites in southwest England, secondary infection of European beech (*Fagus sylvatica*), roble beech (*Nothofagus obliqua*), European chestnut (*Castanea sativa*), European white birch (*Betula pendula*), *Rhododendron ponticum*, western hemlock (*Tsuga heterophylla*), and Douglas-fir (*Pseudotsuga menziesii*) is also occurring, apparently a result of the high levels of *P. ramorum* inoculum produced from larch foliage.

## 9/10

- *P. ramorum*-infected Japanese larch has been confirmed for the first time in northern Wales and Ireland, while ground surveys in England continue to identify more suspect *P. ramorum* sites.
- Washington has identified a Kitsap Peninsula creek *P. ramorum* water positive further downstream than previous detections. This creek is associated with a Peninsula nursery that has been free from the pathogen for several years following implementation of the Confirmed Nursery Protocol; however, the brackish creek water continues to be *P. ramorum* positive.
- Nurseries in California (Stanislaus County) and Washington (Pierce County) were found positive for *P. ramorum*.
- Florida has implemented a new rule regulating firewood. The intent of the rules is to prevent the introduction of wood boring pests, wood inhabiting pests, and plant pathogens (including *P. ramorum*) into the state, and to prevent the spread of pests within the state by regulating the movement of firewood and unprocessed wood products that can harbor wood boring and wood inhabiting pests and pathogens.
- The new fungicide Adorn™ has been registered for use in California (EPA Reg. No. 59639-141) against *P. ramorum*. The product is intended for ornamental use only and can be applied to foliage or as a soil drench. The active ingredient fluopicolide has been proven to be effective on other *Phytophthoras*, and must be tank-mixed with another product (such as a mefenoxam) for fungicide resistance management.
- *P. ramorum* has recently been isolated from a bole canker on a mature canyon live oak (*Quercus chrysolepis*). This first culture isolation complements previously reported PCR detections, lab inoculations, and epidemiological data showing that canyon live oak is susceptible to lethal bole cankers.
- Three new areas of *P. ramorum*-infected Japanese larch trees in Northern Ireland's Antrim and Down Counties were confirmed.

## 8/10

- Retail nurseries in California (Mendocino County and Humboldt County), Washington (King County), and Oregon (Washington County) were confirmed positive for *P. ramorum*.
- The USDA Forest Service, Pacific Southwest Research Station Sudden Oak Death/*P. ramorum* research program funded 13 new projects as well as 14 continuing projects, for a total of \$1,401,441.
- The implementation of the Federal Order requiring pre-notification for shipping *P. ramorum* host nursery stock from regulated and quarantine areas has been delayed until further notice.

## 7/10

- Water draining an infested nursery in Mecklenburg County (Charlotte), NC has been found to have *Phytophthora ramorum* as a result of the 2010 National *P. ramorum* Early Detection Survey of Forests. This brings the total number of positive waterways to 10 in six states outside areas where *P. ramorum* is found in California and Oregon forest areas (WA [2], AL [4], MS [1], GA [1], FL [1], and NC [1]).
- *P. ramorum* has been found in South Wales infecting Japanese larch trees in woodlands managed by Forestry Commission Wales. This is the first time the pathogen has been found in larch outside southwest England. Widespread infection is occurring on larch trees of all ages.
- The *P. ramorum* watercourse detection in Redwood Creek in northern Humboldt County has been followed with the discovery of an infected bay laurel along the stream. The infected tree is located approximately 20 miles southwest of the stream leaf baits that were used for initial detection.
- USDA APHIS has delayed the effective date for implementation of the Federal Order requiring pre-notification for shipping *P. ramorum* host nursery stock from regulated and quarantine areas from June 21, 2010 to July 19, 2010.

## 6/10

- As of June 21, 2010, USDA APHIS will require written pre-notification to destination states of all interstate shipments that include *Phytophthora ramorum* host plants from quarantine or regulated areas. The new rule, under *Phytophthora ramorum* 7 CFR 301.92, is intended to allow states receiving *P. ramorum* host nursery stock to assign and prioritize resources, assure rapid response, and provide direct traceability for any nursery stock known to be positive for *P. ramorum*.
- The Oregon Department of Agriculture has completed testing for the 2010 *P. ramorum* Federal Order Survey on 12,101 samples collected from 299 nursery grower locations, and has detected six positive nurseries. During delimitation surveys at one of the Washington County nurseries, foliar samples were collected from a *Trachelospermum jasminoides* (star jasmine) plant exhibiting suspicious symptoms. The foliage was officially confirmed *P.*

*ramorum* positive on 6/10/2010. Star jasmine was also found positive in June 2010 at a Sacramento County, CA production nursery. As there have been two independent confirmations of infected star jasmine, it is anticipated that APHIS will be adding this newly identified host to the *P. ramorum* list of regulated species.

- A Johnson County, Iowa retail nursery was confirmed *P. ramorum* positive on 6/22/10 as a result of a trace-forward inspection of plants shipped from a positive production nursery in Washington County, Oregon.

#### 5/10

- Australia has adopted emergency measures prohibiting the importation of *P. ramorum* host species (other than tissue cultures) from Canada in an effort to minimize the risk of pathogen introduction into the country.
- California has had five *P. ramorum*-positive nurseries identified since April 30, 2010, and found *Trachelospermum jasminoides* (star jasmine) as *P. ramorum* positive for the first time.
- Two nurseries in Oregon (Marion County and Washington County) and two in Washington (Thurston County and Snohomish County) were found *P. ramorum* positive in May 2010.

#### 4/10

- *P. ramorum* positives were found in a variety of nurseries, from Lancaster County, Pennsylvania (production); Mecklenburg County, North Carolina (retail); Greenville County, South Carolina (retail); Clackamas County, Oregon (wholesale); and Clark County, Washington (production).
- South Carolina rescinded its *P. ramorum* rule that required California and Oregon growers importing plants to the state to comply with additional guidelines which were more restrictive than the federal regulations. The repeal effectively ends the lawsuit filed on 3/8/10 by the California Association of Nurseries and Garden Centers (CANGC) and the Oregon Association of Nurseries (OAN) and restores the right of all nurseries in California, Oregon, and Washington to ship *P. ramorum* host and associated host plants to SC, provided they follow the federal rule.
- Korea updated its list of *P. ramorum*-regulated hosts to include: *Choisya ternate*, *Cornus kousa*, *Daphniphyllum glaucescens*, *Lithocarpus glaber*, *Magnolia cavaleri*, *Magnolia foveolata*, *Ribes laurifolium*, *Vaccinium myrtillus*, and *Vaccinium vitis-idaea*.

#### 3/10

- Tests conducted by UK Forest Research show that Japanese larch foliage strongly supports *P. ramorum* sporulation. This inoculum load in the crowns of affected larch has likely led to widespread local infection on the foliage and boles of nearby susceptible tree and understory species, as well as caused bole infections on the larch. Affected understory species include beech, sweet

chestnut, oak species, and birch, all of which are known to suffer from bole cankers. Over the past six months a number of conifer species have also emerged as bole hosts, including western hemlock, Port Orford cedar, and Douglas-fir. Western hemlock is also confirmed as a foliar host.

- A lawsuit is filed in Columbia, SC by the CANGC and OAN, seeking to overturn a new SC regulation that requires CA and OR growers shipping plants to SC to comply with additional inspection, documentation and advance notice requirements which are more restrictive than the federal *P. ramorum* rules.

## 2/10

- The EU1 strain is now the most common *P. ramorum* lineage detected in WA state nurseries and non-nursery sites, with a concurrent rise in NA2 and decrease in NA1.
- Of the 46 WA nurseries found positive since 2003, twenty have been confirmed positive at least two years. Genotype analysis has been performed on samples from 31 nurseries since 2005. Of the nurseries with multiple confirmed years, six had various combinations of two lineages for one or two years and one had a year with all three lineages followed by two other years with two lineages present each year.
- Nine WA non-nursery sites (landscapes, water, soil or trace-forward landscape plants) have been identified *P. ramorum* positive since 2005. Of the sites, the Sammamish River has been confirmed positive for three years with several lineages, and four residential trace-forwards from an EU1-positive nursery have been found in the past two years, all of which have been identified with the EU1 strain.
- Ten species are added to the list of federally regulated *P. ramorum* associated host plants: Mexican-orange (*Choisya ternate*), kousa dogwood (*Cornus kousa*), *Daphniphyllum glaucescens*, European holly (*Ilex aquifolium*), Japanese-oak (*Lithocarpus glaber*), *Magnolia cavalieri*, *Magnolia foveolata*, bayleaf currant (*Ribes laurifolium*), bilberry (*Vaccinium myrtillus*), and lingonberry (*Vaccinium vitis-idaea*).

## 1/10

- Follow-up sampling findings of the Pierce County, WA perimeter survey reported in the 9/09 COMTF newsletter determine that the infested salal plants in the natural landscape are of the NA2 lineage. This is the first detection of the NA2 lineage on native forest vegetation.
- Findings from the 2009 National *P. ramorum* Early Detection Survey of Forests have resulted in more stream detections outside of nurseries and to the east of the regulated states than in any other year. To date for the 2009 season, five new streams have been found positive – three in AL, one in OR, and one in GA. Since the inception of the survey in 2006, 15 positive streams have been identified, nine of which have been outside of the regulated areas

in CA and OR. No established infection has been detected in streamside plants.

#### 11/09

- Japanese larch, western hemlock, and birch are reported as new *P. ramorum* hosts by the UK. Japanese larch symptoms include wilted, withered shoot tips and blackened needles; branch dieback; and branch and upper trunk cankers. Birch (*Betula pendula*) and western hemlock (*Tsuga heterophylla*) are found with bole cankers.

#### 10/09

- *P. ramorum* is detected in a new watershed in Humboldt County. The pathogen was confirmed from leaf baits in Blue Slide Creek, a tributary to the Mattole River with headwaters approximately 5.6 miles northwest of the community of Redway. Blue Slide Creek is located at the southeastern boundary of the watershed. No infected vegetation has been found to date.

#### 9/09

- A Montgomery County, Maryland residence is found to have a *P. ramorum*-positive witch hazel (*Hamamelis intermedia* 'Jelena') plant as a result of a trace-forward investigation from a Lane County, Oregon nursery found positive for the pathogen in April 2009.

#### 8/09

- A new Mendocino County watershed is confirmed *P. ramorum* positive. At the far eastern reaches of Big River, a hillside above the Orr Hot Springs resort has been found to have infected CA bay laurel and tanoak. This find is 11 miles north from one of the earliest confirmed Mendocino County infestations in the Indian Creek drainage in 2002.
- A Montgomery County, Pennsylvania residential site is found to have *P. ramorum*-positive *Rhododendron bathyphyllum* on 8/17/09. The detection is the result of a trace-forward inspection of rhododendrons shipped from an infested nursery in Lane County, Oregon.

#### 7/09

- *P. ramorum* is confirmed in a campground at MacKerricher State Park, 3 miles north of Fort Bragg in Mendocino County, and approximately 40 miles south of the nearest known positive site in Humboldt County. The MacKerricher site is now the northernmost location within Mendocino County from which the pathogen has been isolated.
- A *P. ramorum*-positive Pierce County, Washington retail nursery perimeter survey finds several salal (*Gaultheria shallon*) plants in one colony to be *P. ramorum*-positive on a bank outside the nursery on county land. Water from

the infested nursery area drains into the native salal stand. This is a documented incident of *P. ramorum* moving out of an infested nursery and causing disease outside the nursery.

- On 7/31/09, a second *P. ramorum* detection is made on salal outside of the retail nursery in Gig Harbor (Pierce County), Washington. This second find is along the same drainage ditch as the first and across the road from the retail nursery. These salal plants are about 100 meters south of the previously reported salal detection.

## 6/09

- South Carolina implements state regulations regarding the importation of *P. ramorum* host plants into SC from CA, OR, and WA nurseries. As of 6/26, any *P. ramorum* regulated article moving into SC from a regulated area must be accompanied by a state phytosanitary certificate. Prior notification of host movement is also required at least 24 hours in advance of a scheduled shipment arrival.
- A Kitsap County, WA residential landscape site is found to have *P. ramorum*-positive *Rhododendron* Sp. 'Roseum Elegans' as part of a trace-forward investigation from an infested wholesale/production nursery in Thurston County, WA. The plant is removed and destroyed.
- A Greenville County, SC residential landscape site is confirmed to have a *P. ramorum*-positive *Rhododendron* Sp. 'Catawbiense Boursault'. The detection is made as a result of a trace-forward inspection of plants received from an infested nursery in Snohomish County, WA. The plant is removed and destroyed.

## 5/09

- Follow-up surveys conducted from 12/08 to 3/09 of a Forsyth County, GA nursery (originally found positive in 12/08) have detected the pathogen inside the nursery as well as off-site where water is draining from the nursery. As part of the National *P. ramorum* Early Detection Survey of Forests, *P. ramorum*-positive findings were obtained in 2/09 from a nearby lake. The lake is used to irrigate the positive nursery as well as an adjacent woody ornamental nursery (not known to be *P. ramorum*-positive) and an adjacent subdivision (not known to be *P. ramorum*-positive). A stream draining the lake, nurseries, and subdivision was also found positive just downstream from the nurseries in March, April, and May. Additional positives were obtained in April from one of two streams feeding the lake.
- To date, the 2009 National Survey has identified six stream baiting positives in water outside of nurseries in five states: WA (1), MS (1), AL (2), GA (1), and FL (1). All confirmed locations have had more than one positive survey this year. All vegetation samples collected so far in 2009 from a local environs survey outside the MS nursery have been negative for the pathogen after multiple positives in 2008.

## 3/09



- A rhododendron leaf bait deployed in 12/08 in a Gadsden County, FL stream (outside a previously confirmed positive retail nursery) is found culture positive. The nursery had most recently been confirmed positive in 2/08 from soil and water samples.

## 2/09

- *P. ramorum* is once again confirmed in McKinleyville's Mill Creek (Humboldt County). The pathogen is recovered from leaf baits deployed and recovered. This is the fourth year that *P. ramorum* has been recovered from McKinleyville streams with no obvious symptomatic hosts.
- The UK confirms the first case of *P. ramorum* on European blueberry (*Vaccinium myrtillus*). The infected blueberry is found in a mixed deciduous woodland with *P. ramorum*-infected *Rhododendron*. USDA APHIS is reviewing the findings and anticipates adding this newly identified host to the federally regulated list of *P. ramorum* hosts.
- USDA APHIS announces that it will be adding *Daphniphyllum glaucescens* to the federally regulated list of *P. ramorum* associated hosts. The pathogen was detected in a British Columbia nursery in 5/08 by the CFIA. Symptoms include leaf spots and necrosis as well as stem dieback.
- Follow-up survey efforts regarding the *P. ramorum*-positive Mississippi nursery and ditch finds last year are still underway. The latest survey efforts resulted in the recovery of *P. ramorum*-positive stream bait samples monthly from 11/08 – 2/09. The positive samples were taken from the ditch (outside the nursery), Hog Creek (about 100 feet downstream from the confluence of the ditch and Hog Creek), or both.
- It is announced that *P. ramorum* is confirmed in Serbia for the first time. In 6/08, *P. ramorum* symptoms were observed on 12 *Rhododendrons* in an open garden. Symptomatic leaves and petioles were sampled and confirmed positive. The infected plants were destroyed and measures taken to eradicate the pathogen according to European Union standards.

## 1/09

- Washington State confirms two *P. ramorum*-positive residential landscape finds. Both are the result of trace-forward inspections. The positive plants found at both locations are *Rhododendrons*.
- *Choisya ternate* (Mexican orange) and *Ribes laurifolium* are found *P. ramorum* positive after sampling plants with foliar dieback symptoms at a UK nursery. APHIS will add these species to the federally regulated list of *P. ramorum* associated hosts.

## 10/08

- China's General Administration of Quality Supervision, Inspection, and Quarantine implements "Phytosanitary Requirements for the Import of Host Plants of *Phytophthora ramorum* from Regulated Areas." Regulatory agencies for the exporting countries must provide China with a list of approved registered nurseries. The new requirements include assuring all *P. ramorum* host plants are from nurseries free of the pathogen, and also call for laboratory testing by regulatory agencies prior to host exportation to ensure absence of the pathogen. The host plant growing media will also be subject to disinfection treatment measures such as heat treatment prior to exportation to China.

#### 8/08

- Kousa dogwood (*Cornus kousa*) is added to the federal list of hosts regulated for *P. ramorum*.

#### 7/08

- *P. ramorum* is confirmed in the Little River at Van Damme State Park in Mendocino County near the town of Mendocino. Taken from March water baiting samples, the positive cultures represent the northern most detection of the pathogen in the County.

#### 6/08

- The Big Sur Basin Complex fire is burning in areas with elevated fuels due to SOD mortality. To date, most of the burn area has contained older dead trees; however, the fire is moving north toward Palo Colorado and vicinity where more recent SOD mortality has occurred. The fine fuels from attached leaves on these recently killed trees can increase the difficulty of fire suppression.
- The US Fish and Wildlife Service pre-approves SOD eradication (up to 250 acres per agency per year for the next 5 years) on USFS and BLM northern spotted owl and marbled murrelet lands in SW Oregon. This will allow agencies to respond to infested sites more quickly.

#### 5/08

- WSDA confirms *P. ramorum* in the Sammamish River. This site was also positive in 2/08 as well as 2007.
- An 80-acre fire along Saint Helena Road in Napa County ignites when the green stem of a coast live oak with Sudden Oak Death fell onto a power line. Approximately \$100,000 is spent for suppression.
- An OR landscape site is found with *P. ramorum*-positive *Rhododendron*. Delimitation surveys are underway. The infected plant was purchased from a positive OR nursery earlier this year.

- *Cercis chinensis* (Chinese redbud) and *Magnolia (Michelia) figo* (banana shrub) are added to the USDA APHIS *P. ramorum* list of federally regulated plants. *Cercis chinensis* was found positive at a previously positive British Columbia nursery on November 16, 2007. The *Magnolia figo* was found during a compliance agreement inspection at a Contra Costa County, CA nursery.

#### 4/08

- WSDA reconfirms *P. ramorum* in the Rosedale Stream (found positive in 2007) at a new confluence in a field below a previously *P. ramorum*-positive nursery.
- USDA APHIS adds *Magnolia denudata x salicifolia* (Magnolia), *Magnolia kobus* (Kobus magnolia), *Magnolia salicifolia* (Anise magnolia), *Magnolia x thompsoniana* (Magnolia), and *Magnolia liliiflora* (Purple magnolia) to the list of *P. ramorum* federally regulated plants.
- Additional foliage samples are taken for analysis from native trees and shrubs along the ditch outside of the MS nursery on 4/29. Results from both isolation attempts and molecular tests are negative for *P. ramorum*. Follow-up water samples inside and outside the nursery perimeter are also negative. Additional sampling will be conducted in the fall and following spring.
- A MS survey is conducted on 4/1 of the nursery-ditch site previously found positive. All vegetation samples collected outside of the nursery (samples were taken from higher ground than previous samples due to flooding) are negative. Water samples collected from the ditch on nursery property are positive.

#### 3/08

- A PCR *P. ramorum*-positive stream bait sample is obtained from the MS ditch (previously found with PCR-positive willow); however, isolations are negative. Follow-up monitoring efforts continue.
- *P. ramorum* is confirmed in a Harris County, Texas landscape setting. The confirmation is made during trace-forward investigations resulting from a *P. ramorum*-positive Southern California nursery. The positive *Camellia* sp. planted in the Texas yard was removed and destroyed. To date, follow-up landscape soil sampling results have been negative.

#### 2/08

- WSDA reconfirms *P. ramorum* in the Sammamish River at the original 2007 positive site.

#### 1/08

- Oregon's Curry County quarantine area is officially expanded to 162 square miles, following the State's amendment to their *P. ramorum* quarantine. For the first time, nurseries and a lumber mill are located within the quarantine

area. ODA is working with affected businesses to set up the compliance agreements and inspection schedules necessary to meet federal interstate shipping requirements.

## 12/07

- Water baiting efforts from a ditch (that drains into a creek) outside of a nursery in Jackson, MS result in nested and real-time PCR positives. A supplemental vegetation survey of the ditch vicinity leads to nested and real-time PCR positives of willow. Due to possible surface contamination of the samples by silt from flooding prior to collection, further regulatory action is not yet being taken. Follow-up sampling is being conducted.
- *Corylopsis spicata* (spike witch hazel - Hamamelidaceae) and *Physocarpus opulifolius* (ninebark - Rosaceae) are added to the list of federally regulated associated host plants. The CFIA found both plants naturally infected in a BC, Canada nursery. Spike witch hazel symptoms were identified as leaf necrosis and ninebark symptoms included leaf necrosis and dieback.

## 11/07

- ODA publishes a notice to amend the state quarantine for *P. ramorum* and the regulated area for nursery stock. The proposed amendments include increasing the Curry County *P. ramorum* quarantine area to 166 square miles (including five newly detected sites outside of the existing quarantine area) and it would harmonize the state's *P. ramorum* rules with current federal regulations and protocols.

## 10/07

- *P. ramorum* inoculum was baited from Norton Creek (a small coastal stream in northern Humboldt County in the town of McKinleyville) early in the summer of 2006, with a repeat detection in the spring of 2007. The recovered isolates have been genotyped, revealing that two lineages are present: the Northern American (NA1) and European (EU1). This is the first find in North America of the EU1 lineage in a wildland environment. Efforts are being made to determine the spore source location, including exhaustive streamside surveys. A small retail nursery in downtown McKinleyville has been found to have *P. ramorum*-positive plants, including three plants confirmed with the EU1 strain, but the nursery is located in a different watershed than the infested stream. No definitive linkages between the nursery and stream have been established.

## 9/07

- *Garrya elliptica* and *Mahonia aquifolium* are now regulated by the USDA APHIS for *P. ramorum*. Nurseries operating under a compliance agreement may continue to ship hosts and associated plants, including the newly listed plants. However, all other nurseries containing these newly listed plants must be properly inspected, sampled, tested, and placed under a Compliance Agreement by September 7, 2007 in order to be able to move regulated plants interstate.

## 8/07

- The EU implements changes to their *P. ramorum* regulations. The decision amends the list of plants, wood, and bark susceptible to *P. ramorum*; increases from one to two the number of official inspections of specific species of susceptible plants in places of production and extends eradication measures to cover growing media and plant debris as well as sanitizing the surface upon which infected plants have been standing.

## 7/07

- Rhododendrons planted along a residential roadway are found *P. ramorum* positive in Thurston County, WA. WSDA has implemented the landscape protocol; all rhododendrons along the roadway have been destroyed. The positive plants were provided to the landscaper from an out of state West Coast nursery.

## 6/07

- Following the April *P. ramorum*-positive stream baiting sample taken from the Sammamish River in King County, WA, WSU and WSDA collaborated with USDA ARS to genotype 40 isolates sampled from 12 nurseries both within and outside the Sammamish watershed in an attempt to trace the origin of the river isolate. Upon analysis, the Sammamish River isolate has a unique fingerprint that matches an isolate from a landscape supplier located outside of the watershed. While not a conclusive study, the finding does suggest the Sammamish River isolate may have been introduced from nursery stock originating from this wholesaler.
- Oregon Grape (*Mahonia aquifolium* [Pursh] Nutt. - Berberidaceae Family) is found *P. ramorum*-positive for the first time at a Canadian nursery. Symptoms are primarily foliar, and include leaf spots and discoloration. This host species is native to the West Coast of the US. APHIS is reviewing the findings and anticipates adding Oregon Grape to the list of *P. ramorum*-regulated hosts soon.

## 5/07

- The MS Forestry Commission, MS Department of Agriculture, USDA FS, and USDA APHIS develop a follow-up survey plan in response to the *P. ramorum* water baiting confirmation made in MS last month. The plan includes immediately implementing stream baiting, soil baiting around the edge of the waterway where the positives were obtained, and vegetation surveys. These same survey activities will be repeated in the fall.

## 4/07

- The 2007 National *P. ramorum* Early Detection Stream Baiting Survey for Forests has recovered two *P. ramorum*-positive samples. One of the positive

recoveries is from WA state and one from MS. The positive western WA river sample was recovered downstream from several confirmed nurseries. The source of the inoculum has not been determined. The MS confirmation was made from a ditch draining a *P. ramorum*-positive nursery. The pathogen has not been detected in vegetation outside the nursery.

- OR has removed all tanoak and evergreen huckleberry within the treatment boundary established as a result of the new outbreak identified in March 2007. Piles will be burned as soon as conditions are appropriate.

### **3/07**

- OR has identified a new *P. ramorum* outbreak that is approximately 1.5 miles north of their current quarantine area. The site was detected during ground-based surveys being conducted as a follow-up to a *P. ramorum*-positive water baiting sample.
- The European *P. ramorum* lineage has been reported for the first time in CA. It was recovered from three Humboldt County nursery isolates taken in spring of 2006 and analyzed as part of a genetic study of *P. ramorum* isolates from CDFA. Current samples have been taken at the nursery; results are pending. Trace-back investigations are underway for the 2006 confirmations.
- ODA increases the size of OR's quarantine area to 24.25 sq. mi. following recent discoveries of new *P. ramorum* infection centers in Curry County. There are now three areas under quarantine: two small satellite infection areas that are 1 sq. mi. each in size and the original area that has increased to 22.25 sq. mi. Eradication efforts are ongoing in all three quarantine areas.

### **2/07**

- Sixteen silk tassel bush (*Garrya elliptica*) plants are found *P. ramorum*-positive for the first time in the UK. This host species is a West Coast US native. APHIS is reviewing the findings and anticipates adding silk tassel bush to the *P. ramorum*-regulated host list soon.
- The new USDA APHIS *P. ramorum* regulation "*Phytophthora ramorum*; Quarantine and Regulations" is published February 27, 2007 in the Federal Register. This rule primarily codifies the Federal Order issued in December 2004 that established restrictions on the interstate movement of nursery stock from nurseries in nonquarantined areas in CA, OR, and WA. The rule also incorporates all updates (SPROs) issued since the original APHIS regulation was published in 2002, most of which are updates to the host list.

### **1/07**

- The Tiffany Creek Preserve in Nassau County, NY is officially confirmed *P. ramorum*-free. One PCR *P. ramorum*-positive red oak forest find was made at the Preserve in 2005. With all findings remaining negative, the area is now officially considered *P. ramorum*-free and will no longer fall under regulatory scrutiny.

- The UK finds *Schima wallichii* (Chinese guger tree) to be a new *P. ramorum* host. The symptomatic foliar samples were taken outdoors from a historic garden near Cornwall in 2006. USDA APHIS is reviewing the findings and anticipates adding Chinese guger tree to either the host or associated host list soon.
- *P. ramorum* continues to spread in Mendocino County with new detections north of Elk. Sudden Oak Death is now present in patches along the Highway 128 corridor from Highway 101 west, to within 4 miles of the Pacific Ocean.
- The USDA FS, Forest Health Protection, Pacific Southwest Region has published their "2006 Accomplishment Report: Aerial and Targeted Ground-Based Monitoring for Sudden Oak Death." In 2006, crews confirmed 10 new *P. ramorum* detections - 9 in southern Mendocino County and 1 in southern Monterey County. There were no detections in Del Norte, San Benito, San Luis Obispo, or Santa Barbara Counties, nor were there detections in the northern parts of Mendocino and Humboldt Counties.
- Two new *P. ramorum* A2 isolates from the EU lineage are identified in Belgium. Both new isolates originated from nurseries in northern Belgium from two separate sites and from different hosts (*Rhododendron* and *Viburnum*). One isolate was from a 2002 survey, and the other from a 2003 survey. The isolates were found during a screening of 257 isolates collected between 2002 and the end of 2005.

## 12/06

- In 2006, 35 new *P. ramorum*-infested sites (139 infected tanoak trees) were discovered in Curry County, OR. This is the highest number of detections since the eradication effort began in 2001. Two of the new sites occurred outside of the quarantine zone, with each site more than 2 miles from a known infestation. The largest new site covered 10 acres and contained more than 40 infected trees. In addition to the new sites, six existing eradication sites have been expanded to include infected trees that were found near their perimeters. All sites will be treated and the quarantine area will be expanded.
- In 2006, USDA APHIS reported 62 sites in 11 states as having had nursery-related *P. ramorum* detections. Positive findings by state are: AL(1), CA(28), CT(1), FL(2), GA(1), IN(1), ME(1), MS(1), OR(13), PA(1), and WA(12).
- The USDA Forest Service "2006 National *P. ramorum* Early Detection Survey for Forests" was conducted in 36 states. Of the 1,044 locations surveyed nationwide, 607 were nursery perimeter locations and 437 were general forest locations. All of the 4,016 samples processed were negative for *P. ramorum*.
- USDA FS national water monitoring survey protocols were pilot tested during 2006 in 93 watersheds in 11 states. WA became the first state using national survey protocols to detect *P. ramorum* in a stream not known to be infested. The intermittent stream flowed through a woody ornamental nursery that had previously been confirmed *P. ramorum*-positive. Follow-up terrestrial surveys up- and downstream found no infection of forest vegetation.

## 11/06

- UC Cooperative Extension (Valachovic and others), CDF, and CSP finish burning 45 acres of public and private land, closing out the 2006 experimental silvicultural treatment for managing the spread and persistence of *P. ramorum* in southern Humboldt County.

## 9/06

- Researchers report that sequencing the *Phytophthora sojae* and *P. ramorum* genomes has revealed that these *Phytophthoras* have an unprecedented number of genes and genetic flexibility compared to fungal pathogens. Results also indicate that these pathogens have a large arsenal of recently acquired proteins, such as toxins, protein inhibitors, and enzymes that likely enable them to debilitate a host plant's immune system during infection and then kill and destroy plant tissue later on in the infection process. Studies disclosed that nearly half of the genes are undergoing rapid adaptation, likely as a result of pressure from the host plants' defense systems.
- Koch's postulates are completed for: *Acer pseudoplatanus*, *Aesculus hippocastanum*, *Laurus nobilis*, and *Michelia doltsopa*. Consequently, these hosts will be reclassified from the APHIS "Plants Associated with *P. ramorum*" list to the list of "Proven Hosts Regulated for *P. ramorum*."
- The FS and states are conducting nursery perimeter and general forest detection surveys. To date, 567 nursery perimeter surveys have been conducted in 29 states, with 1,498 samples collected. Additionally, 320 general forest surveys have been conducted in 29 states, with 765 samples collected. To date, all samples tested have been found negative for the pathogen.

## 8/06

- *Ceanothus thyrsiflorus*, *Cinnamomum camphora*, *Kalmia angustifolia*, *Nerium oleander*, *Osmanthus fragrans*, *Osmanthus heterophyllus*, and *Quercus acuta* are officially added to the APHIS list of regulated "Plants Associated with *Phytophthora ramorum*."
- *Fagus sylvatica*, *Kalmia latifolia*, *Quercus cerris*, *Salix caprea*, and *Viburnum* spp. are transferred from the APHIS "Plants Associated with *P. ramorum*" list to the "Proven Hosts Regulated for *P. ramorum*" list, based on the completion of Koch's postulates.
- *Eucalyptus haemastoma* Sm. (Myrtle family), *Cornus kousa* x *Cornus capitata* (Dogwood family), and *Castanopsis orthacantha* Franchet (Beech family) are added to the UK DEFRA list of Plants Reported as Natural Hosts of *P. ramorum*. All three hosts were found *P. ramorum*-positive in the United



Kingdom. APHIS is researching the findings and anticipates adding these plants to APHIS "Plants Associated with *P. ramorum*" list soon.

- Canada adds five new genera to the CFIA *P. ramorum* host list: *Loropetalum*, *Distylium*, *Manglietia*, *Parakmeria*, and *Ilex*. These additions are the result of positive confirmations from the species: *Loropetalum chinese*, *Distylium myricoides*, *Manglietia insignis*, *Parakmeria lotungensis*, and *Ilex purpurea*. APHIS is reviewing the findings and anticipates adding the new hosts to the APHIS "Plants Associated with *P. ramorum*" list in the near future.
- Researchers report findings of *P. ramorum* infecting Camellia flower buds. This is the first report of camellia flower bud infection in the field with the North American genotype of *P. ramorum*.

### 7/06

- Researchers report *P. ramorum* reduces xylem sapflow and specific conductivity of sapwood in mature tanoak. This is the first report that *P. ramorum* interferes with water conductance.
- Summer aerial surveys mapping oak and tanoak mortality in Mendocino, Humboldt, Del Norte, San Luis Obispo, western San Benito, and Santa Barbara Counties, as well as western Monterey County, are complete. In total, approximately 20,000 acres of mortality were mapped, 9,000,000 acres surveyed, and 6,667 miles flown. Follow-up ground-check surveys, are under way.

### 6/06

- Researchers report findings in Humboldt County of natural infection of tanoak seedling roots by *P. ramorum*. This is the first report that *P. ramorum* can be recovered from roots of naturally occurring forest vegetation.
- *Osmanthus fragrans* (sweet olive) and *Osmanthus heterophyllus* (false holly), are found *P. ramorum*-positive in a Humboldt County nursery. APHIS is reviewing the findings and anticipates adding these new species to the APHIS *P. ramorum* associated host list in the near future.
- APHIS confirms *Nerium oleander* (Oleander) to be a new *P. ramorum*-associated host when delimitation survey samples from the Humboldt County facility are confirmed positive.
- The first *P. ramorum*-positive beech in the Netherlands is reported. Symptoms include stem bleeding. This is the first time a plant species native to the Netherlands has been identified with the pathogen. At both locations the affected beech are surrounded by heavily infected rhododendrons.

### 5/06

- *P. ramorum* is detected on dead tanoaks a few miles outside the OR quarantine area on OR State Parks and Rogue River-Siskiyou National Forest-

administered lands near Brookings, OR. This is the first find of *P. ramorum* on USDA FS land in OR.

#### 4/06

- The Government Accountability Office's report, "Invasive Forest Pests: Lessons Learned from Three Recent Infestations May Aid in Managing Future Efforts," (GAO-06-353, April 2006) is published. The report evaluates the federal response to three invasive forest pests: Asian longhorned beetle, emerald ash borer, and *P. ramorum*. The report can be accessed at: <http://searching.gao.gov/query.html?col=+&qt=+sudden+oak+death&charget=iso-8859-1&qf>.
- "Sudden Oak Death and *Phytophthora ramorum*: A Guide for Forest Managers, Christmas Tree Growers, and Forest Tree Nursery Operators in Oregon and Washington" is published and can be found online at: <http://extension.oregonstate.edu/catalog/pdf/em/em8877.pdf>.
- The USDA FS, PSW Research Station 2006 *P. ramorum* RFP process is complete. In total, 46 proposals seeking over \$5 million in research funds were received. However, due to limited funding, only nine projects were awarded, totaling approximately \$665,000.

#### 3/06

- The first finding of *P. ramorum*-infected *Ceanothus thyrsiflorus* (blue blossom) is confirmed from southern Humboldt County, growing along the road within a *P. ramorum* treatment area in the lower Salmon Creek watershed. Symptomatic tissue includes leaves, stems, and shoot tips. USDA APHIS is reviewing the findings and anticipates adding *Ceanothus thyrsiflorus* to the federal *P. ramorum* host list soon.
- New Zealand issues a public notice addressing nursery stock importation concerns, including risk mitigation measures and the host list for *P. ramorum*. With the exception of high-value plants for which the risk of *P. ramorum* is mitigated, hosts of *P. ramorum* are only permitted to be imported from countries recognized by New Zealand as Pest-Free Areas, which currently include: Australia, Canada, Israel, and South Africa. The proposed date of adoption and enforcement is May 29, 2006.
- Taiwan, Penghu, Kinmen, and Matsu issue a public notice proposing a draft amendment of the "Quarantine Requirements for the importation of plants or plant products." Among the changes is the designation of *P. ramorum* as a quarantine pest, whereby: "The importation of living plants (excluding flowers, fruits and seeds) of its hosts will be prohibited. Regions or countries affected include: Belgium, British Channel Islands, Denmark, France, Germany, Ireland, Italy, Netherlands, Norway, Poland, Slovenia, Spain, Sweden, Switzerland, UK, BC, CA, FL, GA, OR, and WA.

#### 2/06

- A water sample taken from a seasonal stream in Pierce County, WA is confirmed *P. ramorum*-positive. Plants from the adjacent nursery tested positive in 2004 and 2005. Agencies are monitoring the water upstream and downstream from the positive site to determine the extent of water contamination. Monitoring for signs of infestation throughout the immediate watershed area outside of the nursery will also be conducted.
- APHIS issues a SPRO Letter, adding 13 new plant species to the federal *P. ramorum* associated host list. The SPRO can be found on the APHIS website under "Revision of Listed and Regulated Articles" dated 2/10/06 at: <http://www.aphis.usda.gov/ppq/ispm/pramorom/regulations.html>.
- Koch's postulates are completed for *Frangula purshiana* (formerly listed as *Rhamnus purshiana*), *Adiantum aleuticum*, and *Adiantum jordanii*. Consequently, APHIS reclassifies these associated hosts as hosts.
- *Acer circinatum* and *Arctostaphylos columbiana* samples from Humboldt County are confirmed *P. ramorum*-positive via culturing. APHIS is reviewing the findings and anticipates adding these two species to the host list in the near future.

#### 1/06

- California's southern Humboldt County *P. ramorum* experimental treatment and suppression project begins on CA State Parks property along the Avenue of the Giants. The project includes the removal of infected tanoak, CA bay laurel, and madrone trees, as well as the pruning of coast redwood trees in a 50-acre area.
- Canada notified the US of 5 new genera of nursery plants found in BC to be infected with *P. ramorum*. The new host genera under Canadian regulation since December include: *Ardisia*, *Euonymus*, *Gaultheria*, *Osmanthus*, and *Prunus*.
- The Canadian nursery industry intensifies their *P. ramorum* Nursery Certification Program, which includes annual sampling and testing, training, and independent audits, as well as more rigorous BMPs to be implemented by August 2006.
- The first 2006 *P. ramorum*-positive California nursery is identified during a compliance agreement inspection. The find was made on a *Camellia japonica* in a Los Angeles County production nursery that only sells plants to local landscapers and does not ship plant material. CNP is underway at the facility. This nursery was also found *P. ramorum*-positive during last year's compliance agreement inspection, and had completed CNP in May 2005.

#### 12/05

- In 2005, USDA APHIS reported 99 sites in seven states have had nursery-related *P. ramorum* detections. Positive findings by state are: CA(55), GA(4), LA(2), OR(20), TN(1), SC(1), and WA(16).

## 11/05

- The 2006 Agriculture appropriations bill is passed by the Senate, and includes \$3,076,000 for *P. ramorum* detection, monitoring, control, and eradication, as well as \$98,000 for disease research being conducted at UC Davis. The bill now goes to the President for final approval. (These appropriations only include USDA APHIS, ARS, and CSREES funding allotments.).
- *P. ramorum* is first detected from California red fir (*Abies magnifica*) symptomatic shoots at a Christmas tree farm near Los Gatos, CA.
- The state-funded CA SOD Hazardous Tree Removal Program comes to a close. In all, approximately 4,020 trees were removed under the contract for a cost of \$1,503,645, averaging \$374 per removal.

## 10/05

- A new *P. ramorum*-infested site in Humboldt County has been confirmed 6 miles north of the Garberville/Redway area on Humboldt Redwoods State Park property along the Avenue of the Giants.
- Results of the 2005 western North Carolina pilot stream sampling project found fifteen different *Phytophthora* species in monthly samplings between 4/05 and 8/05. *P. ramorum* was not detected, although sampling will continue through November. A 2005 monthly stream baiting pilot project in 10 Washington state streams also detected no *P. ramorum*.
- In spring of 2005, ODA surveyed 103 Christmas tree plantations planted in *Abies* spp. and *Pseudotsuga menziesii* for *P. ramorum*. Christmas tree plantations in 22 Oregon counties were surveyed; *P. ramorum* was not detected in any of the samples.
- To date, the United Kingdom has found *P. ramorum* in rivers and streams near some outbreak sites, as well as at 475 sites in England and 34 sites in Wales, in addition to a number of sites in Scotland, Northern Ireland, and the Channel Isles. England's totals include 380 retail and nursery confirmations, in addition to 95 established gardens, woods, and other wild planting areas. Wales' totals include 26 retail and nursery confirmations along with eight established gardens, woods, and other wild planting areas.
- The 2005 National *P. ramorum* Survey of Forest Environments results to date include surveys at 519 nursery perimeter locations and 472 forest locations with 2,038 submitted samples. As of 10/31, all samples have been negative for *P. ramorum*.
- *Viburnum opulus* (= *V. trilobum*) - (American cranberry viburnum) was found to be *P. ramorum*-positive at a nursery in Clackamas County, Oregon on 6/6/05. USDA APHIS has reviewed the findings and expects to add American cranberry viburnum to the *P. ramorum* associated host list soon.

- Real-time PCR is validated by USDA APHIS PPQ CPHST for providing diagnostic determinations for the *P. ramorum* federal emergency program.

## 9/05

- CDFA confirms the detection of *P. ramorum* on *Abies concolor* (white fir) at a Christmas tree farm in the quarantined county of Santa Clara, CA. This is the first report of the pathogen on this species of *Abies*. Koch's postulates have not been completed. USDA APHIS has reviewed the CDFA data and expects to add *A. concolor* to the official list of associated host plants soon.
- The California Sudden Oak Death/*P. ramorum* National Wildland Survey is complete. Detection surveys in areas identified as moderate to high-risk for infection in eastern Butte and Yuba Counties were conducted. *P. ramorum* was not detected.
- USDA issues a strategic plan for *P. ramorum*, titled: "Plant Diseases Caused by *Phytophthora ramorum*: A National Strategic Plan for USDA." The report addresses Department goals for *P. ramorum* detection, control, management, research, and restoration programs.
- USDA APHIS issues an updated State Plant Regulatory Official Letter, adding *Acer laevigatum* (Evergreen maple), *Michelia doltsopa* (Michelia), and *Quercus petraea* (Sessile oak), *Adiantum aleuticum* (Maidenhair fern), *Fraxinus latifolia* (Oregon ash), *Osmorhiza chilensis* (Sweet Cicely), *Torreya californica* (California nutmeg), and *Vancouveria planipetala* (Redwood ivy) to the list of associated host plants regulated for *P. ramorum*. The addition of these eight plants brings the list of regulated *P. ramorum* host and associated hosts to 83.

## 8/05

- The 2005 *Phytophthora ramorum* Humboldt County aerial, ground, and stream survey efforts reveal disease intensification and spread in southern Humboldt County, with at least 21 square miles now infested.
- APHIS receives information on three new *P. ramorum*-infected plants from the UK. *Acer laevigatum* (Evergreen maple), *Michelia doltsopa* (Michelia), and *Quercus petraea* (Sessile oak) were found in outdoor, green areas with natural infection. Koch's Postulates have not been completed; these plants will join the APHIS associated host list.
- Five new *P. ramorum* hosts are identified in California's quarantined county forests. The newly confirmed *P. ramorum*-susceptible plants are: *Adiantum aleuticum* (Maidenhair fern), *Fraxinus latifolia* (Oregon ash), *Osmorhiza chilensis* (Sweet Cicely), *Torreya californica* (California nutmeg), and

*Vancouveria planipetala* (Redwood ivy). Koch's Postulates have not been completed; these plants will be added to the APHIS associated host list.

- APHIS issues an updated State Plant Regulatory Official (SPRO) Letter, adding eight new associated host plants and two new host plants to the list of plants regulated for *P. ramorum*. The addition of these 10 plants brings the list of regulated *P. ramorum* host and associated hosts to 75. To refer to the SPRO, go to: <http://www.aphis.usda.gov/ppq/ispm/pramorom/>.
- Six hosts are moved from the associated host list to the host list, with all having Koch's Postulates complete and having been approved by APHIS. The six newly classified hosts are: *Castanea sativa*, *Fraxinus excelsior*, *Quercus falcata*, *Quercus ilex*, *Syringa vulgaris*, and *Taxus baccata*.
- *P. ramorum* federal order compliance agreements, trace-forward/-back investigations, the USDA APHIS National Nursery Survey, and other investigations are ongoing. For 2005, 91 nursery-related sites in seven states have had *P. ramorum* detections. Positive findings by state are: CA(53), GA(4), LA(2), OR(20), TN(1), SC(1), and WA(10).

#### 7/05

- The first *P. ramorum*-infected *Taxus media* is reported from the Netherlands, making it the third type of yew to be identified as *P. ramorum*-susceptible. Koch's postulates have not been completed; this plant has been added to the APHIS list of *P. ramorum* associated host plants.

#### 6/05

- The SODBusters Pilot Project, which organized and implemented two collection yards for *P. ramorum* host material in Marin and Santa Cruz Counties, officially ends June 30, 2005.
- The first *Phytophthora ramorum* caused cankers on *Taxus brevifolia* (Pacific yew) are identified on a tree in Mendocino County.
- *P. ramorum* is recovered from symptomatic tissues of California maidenhair fern (*Adiantum jordanii*) and spice bush (*Calycanthus occidentalis*) collected at Jack London State Park, Sonoma County, CA. Pending the review of laboratory results by CDFA and USDA APHIS, these hosts will be added to the associated host list.
- USDA FS PSW is funding 12 of 40 proposals submitted during the FY'05 USDA PSW *P. ramorum* Request for Proposals, resulting in \$800,000 in allocations during this funding cycle.
- USDA APHIS publishes a [final rule amending 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.

#### 4/05

- APHIS confirms the presence of *P. ramorum* on an OR jasmine plant sample. As a result, ODA, APHIS, and others are working to determine jasmine's status as a host of *P. ramorum*.
- OR reports four trace-forward positives in residential settings. The residential finds originated at a nursery found positive in 2004. Delimitation surveys confirmed the disease has apparently not spread to other plants already in the landscapes. Infected plants have been removed and incinerated.
- The first *P. ramorum*-positive *Acer pseudoplatanus* (Planetree maple) is confirmed at a *P. ramorum* woodland garden site in Cornwall, UK. Pending USDA review and approval, it will be added to the US list of *P. ramorum*-regulated plants.
- The UK completes Koch's postulates on: sweet chestnut (*Castanea sativa*), Holm oak (*Quercus ilex*), and European ash (*Fraxinus excelsior*). Following USDA review and approval, plants will be moved to the US *P. ramorum* host list.
- The [CFIA issues an updated \*P. ramorum\* directive 3/1/05](#), superseding the 9/25/03 order in response to the USDA APHIS 12/21/04 Emergency Order. USDA APHIS is provided \$9.5 million in emergency funds through the USDA CCC to help support *P. ramorum* regulatory activities in 2005.

#### 3/05

- USDA APHIS has changed its *P. ramorum* website address to <http://www.aphis.usda.gov/ppq/ispm/pramorom/> in order to refer to the site by the pathogen's name, rather than Sudden Oak Death, which only represents one of the diseases caused by *P. ramorum*.
- Both the APHIS PPQ Beltsville National Plant Germplasm and Biotechnology Laboratory (NPGBL) and the CDFA laboratory in Sacramento have encountered a *Phytophthora* species that inconsistently produces bands similar to that produced by *P. ramorum* when using nested PCR. The new species is being temporarily referred to as *Phytophthora "azalea."* Based on morphology and partial ITS sequence, the newly identified species is not a strain or subspecies of *P. ramorum*.

#### 2/05

- APHIS proposes an amendment to the PPQ Treatment Manual that would allow California bay laurel leaves to be treated with vacuum heat before being moved interstate from any area under *P. ramorum* quarantine, providing an alternative to the currently approved hot water dip.

#### 1/05

- DEFRA identifies six new plants associated with *P. ramorum*: *Griselinia littoralis* (NZ privet), *Hamamelis mollis* (Chinese witch-hazel), *Magnolia stellata* (star magnolia), *Magnolia x loebneri* (Loebner magnolia), *Magnolia x soulangeana* (saucer or Japanese magnolia), and *Parrotia persica* (Persian Parrotia or iron tree). It is anticipated that APHIS will soon be adding these species to their official *P. ramorum* associated host list.
- The [Second Sudden Oak Death Science Symposium](#), held in Monterey, CA, is attended by 350 people, and includes 80 formal presentations and 47 posters. While wildland issues and *P. ramorum* epidemiology continue to be areas of interest at the Symposium, increased areas of emphasis from the 2002 symposium include nursery issues, soil considerations, and pathogen and host genetics.
- [H.R. 4569](#) (Burns, GA), calling for a national plan for the control and management of Sudden Oak Death, is signed into law, directing the Secretary of Agriculture, through USDA APHIS, to develop the plan in consultation with other federal agencies. Funding is not included in the Bill.
- A previously identified *P. ramorum*-positive nursery in Los Angeles County, CA has found new infection on a camellia. Identifying one symptomatic plant, leaf samples were taken and cultured on-site. Following CDFA's review and confirmation of the nursery's sample, the USDA's CNP has been implemented. Trace-forward information has been submitted for follow-up investigations.

## 12/04

- USDA APHIS issues an [emergency federal order](#) for nurseries that takes effect on 1/10/05, superseding the 4/22/04 emergency order. The new order regulates the interstate movement of all plants from all nurseries in CA, OR, and WA to help prevent the spread of *P. ramorum* to uninfested areas of the US.
- With the issuance of the new USDA APHIS emergency *P. ramorum* order, Canada will rescind regulations on cut flowers (including roses) implemented as a result of the *P. ramorum* nursery infestations in March 2004. With the new federal order in place, Canada will accept any material leaving CA, OR, or WA that is in compliance with the US rules.
- False Solomon's seal (*Maianthemum racemosum*, formerly *Smilacina racemosa*), *Calluna vulgaris* (Scotch heather), and *Photinia fraseri* (Red tip photinia) are moved from the APHIS associated host list to the host list, due to the completion of Koch's postulates for each species.
- USDA APHIS adds *Fraxinus excelsior* (European ash) and *Nothofagus oblique* (Roble beech) to the federal *P. ramorum* regulation, based on detection and confirmation in the UK, where *P. ramorum* was found infecting the boles of these species.
- In 2004, there have been 177 USDA APHIS confirmed positive *P. ramorum* sites in 22 states from trace-forward, national, and other surveys. The



breakdown per state is: AL(3), AR(1), AZ(1), CA(55), CO(1), CT(3), FL(6), GA(16), LA(5), MD(3), NC(9), NJ(1), NM(1), NY(1), OK(1), OR(24), PA(2), SC(4), TN(2), TX(11), VA(2), and WA(25).

## 11/04

- Omnibus appropriations for federal *P. ramorum* funding in 2005 total \$9.89 million. The Agricultural Appropriations Bill earmarked \$1.45 million for ARS; \$94,000 for CSREES; and \$3 million to APHIS. The Interior Appropriations Bill earmarked \$2 million to USDA FS Cooperative Lands Forest Health Management and \$2.5 million to USDA FS Forest and Range Land Research.
- ODA receives and approves a revised federal label for the use of Agrichem's Agri-Fos® (11/22/04, EPA Registration #71962-1) on landscape, golf course, nursery, forestry, and park sites for *Phytophthora* and Pythium diseases, including Sudden Oak Death.
- The federal "Confirmed Residential Protocol for *Phytophthora ramorum* Detections in Landscaped Residential or Commercial Settings" is posted to the [USDA APHIS PPQ](#) website.

## 10/04

- To date, the USDA FS *P. ramorum* Nursery Perimeter and General Forest Survey has sampled 620 nursery perimeter locations in 32 states. Of the 2,454 samples submitted, all were *P. ramorum*-negative. 404 general forest locations in 18 states have also been surveyed, with 1,249 samples submitted. Of those submitted, two confirmations from CA's Golden Gate Park in San Francisco County tested *P. ramorum*-positive.
- The USDA APHIS PPQ *P. ramorum* National Nursery Survey activities are complete in 38 states and Puerto Rico. To date, participating states throughout the US have surveyed 3,095 sites and have collected 50,820 samples. Fifteen survey sites have been confirmed positive.
- UK Minister for Plant Health and Forestry Ben Bradshaw announces [conditional financial assistance](#) for nurseries suffering hardships related to actions taken to protect the wider UK environment from *P. ramorum*.
- Seven new *P. ramorum* infested areas are detected in Humboldt County a few miles from the Redway suppression area. Suppression projects are planned for these new finds. *P. ramorum* is also recovered from the South Fork of the Eel River, approximately 8 km downstream from the Redway suppression area.

## 9/04

- CDFA announces the confirmation of two *P. ramorum*-infected coast live oak trees in Golden Gate Park, making San Francisco County the 14<sup>th</sup> CA county under *P. ramorum* quarantine.

- WSDA begins testing symptomatic and asymptomatic plants coming into the state before unloading shipments in an effort to prevent new *P. ramorum* introductions on host nursery stock.
- The National Plant Quarantine Service, Ministry of Agriculture and Forestry, Republic of Korea modifies its "Tentative phytosanitary measures to prevent the introduction of Sudden Oak Death Disease." Updates to the regulation include the addition of Nassau County, NY, as well as 22 new plant species. These emergency measures prohibit the importation of any propagative host material, such as nursery stock and cuttings, as well as wood (with bark) and growing media from the prohibited areas.

#### 8/04

- APHIS adds *Calluna vulgaris* (Scotch Heather), *Drimys winteri* (Winter's-bark), *Laurus nobilis* (Sweet bay laurel), and *Salix caprea* (Kilmarnock willow) to the *P. ramorum* associated host plant list.
- APHIS removes *Vaccinium vitis-idaea* (lingonberry) from the *P. ramorum* associated host plant list because the Plant Protection and Seed Service of Poland is unable to validate their original association of lingonberry with *P. ramorum*.

#### 7/04

- Mexico is considering quarantining Douglas-fir (*Pseudotsuga*) and fir (*Abies*) Christmas trees from areas of the US with *P. ramorum* to prevent introduction of the pathogen into Mexico. and Markets.
- CAN files a federal suit against KY, charging the state with violating federal law by banning the importation and sale of CA's *P. ramorum* host and associated plants. The lawsuit is based on a provision in the federal Plant Protection Act that gives the USDA authority over interstate plant movement. A federal district judge for the [Eastern District of KY signs a consent decree](#) on 7/30 permanently enjoining KY from having *P. ramorum* regulations that are inconsistent with the federal standard.
- The first finding of *P. ramorum* in a Switzerland nursery has been confirmed on viburnum.

#### 6/04

- A PCR-positive *P. ramorum* sample from Nassau County, NY is confirmed by USDA APHIS. Follow-up surveys are being conducted by a team from the USDA's FS and APHIS, as well as the New York Department of Agriculture and Markets.
- US Senators Barbara Boxer (D-CA) and Gordon Smith (R-OR) introduce the Sudden Oak Death Syndrome Control Act of 2004 (S.2575). If passed, the Act would authorize \$44.2 million annually, including \$25 million for USDA research, regulations, and monitoring; \$18.5 million for management,

treatment, and fire; and \$700,000 for education and outreach.

- *Clintonia andrewsiana* (Andrew's clintonia bead lily), *Dryopteris arguta* (California wood fern), *Smilacina racemosa* (false Solomon's seal), and *Taxus brevifolia* (Pacific yew) are added to the APHIS *P. ramorum* associated host list.
- The US DOE Joint Genome Institute and the Virginia Bioinformatics Institute announce the completion of the DNA sequencing of *Phytophthora ramorum* and *Phytophthora sojae* (a soybean pathogen). The new information will provide a foundation for future diagnostics, in addition to safe and effective applications for use in disease treatment and/or control. Sequencing information can be found at <http://genome.jgi-psf.org/ramorum> and at <http://genome.jgi-psf.org/sojae/>.
- To date, 140 nurseries in 18 states have had *P. ramorum* detections. Positive findings by state are: CA(45), AL(3), AR(1), FL(6), WA(18), OR(9), TX(10), CO(1), GA(13), LA(6), MD(2), NC(9), NM(1), TN(2), PA(1), NJ(1), SC(1), and VA(1). In all, 787,842 plants have been destroyed. Fourteen states are still imposing quarantine regulations on CA beyond those ordered by APHIS PPQ.
- USDA APHIS begins regulating *Camellia spp.* (including all species, hybrids, and cultivars) at the genus level.

#### 5/04

- USDA transfers \$15.5 million from the CCC to APHIS PPQ to help halt the spread of *P. ramorum* to non-infested areas of the US. USDA PPQ has now committed a total of \$20 million to the program in fiscal year 2004. USDA PPQ will apply the funds to quarantine actions, nursery inspections, sampling and testing, and Sudden Oak Death education and outreach.
- Lake County is confirmed as the 13<sup>th</sup> CA county to have *P. ramorum* naturally occurring. As an infested county, Lake County will be added to the quarantine area.
- Fifteen states are currently implementing *P. ramorum* regulations beyond those issued by USDA APHIS.

#### 4/04

- USDA APHIS issues an [amended emergency order](#) restricting the movement of CA nursery stock by requiring CA nurseries that ship *P. ramorum* [hosts or associated plants](#) interstate to be inspected by a regulatory official, sampled, and tested before shipping (see [Nursery Chronology](#)).
- CO, FL, GA, LA, MD, NC, NM TN, TX, VA have confirmations of *P. ramorum*-infected nursery stock shipments from the West Coast (see [Nursery Chronology](#)).
- AL, OR, and LA update their *P. ramorum* quarantines (see [Nursery Chronology](#)).

- Formosa firethorn (*Pyracantha koidzumii*) is added to the *P. ramorum* associated host list following a CFIA find at a Vancouver area nursery (see [Nursery Chronology](#)).
- UCB researchers confirm the susceptibility of wood rose (*Rosa gymnocarpa*) to *P. ramorum*; USDA APHIS adds it to the host list.
- San Joaquin and Butte Counties each have a *P. ramorum*-positive nursery confirmed.

### 3/04

- The federal government earmarks \$7.4 million in funding for *P. ramorum* in 2004. Funds are allocated as follows: \$1.5 million to the USDA ARS for research on horticultural aspects of *P. ramorum*, including \$250,000 for a new genomics research program at the UCD ARS laboratory for analysis of resistance to the pathogen; \$2 million to USDA APHIS for *P. ramorum* quarantine, enforcement, inspection, and monitoring; \$2 million to USDA Forest Service Research for research; and \$1.7 million to the USDA FS, State and Private Forestry, for management, monitoring, and education.
- *P. ramorum* is found at a large Los Angeles County, CA wholesale horticultural nursery. The pathogen was detected on several varieties of camellia plants as part of the National *P. ramorum* Nursery Survey. Trace-forward surveys for the past year's worth of shipments are underway (see [Nursery Chronology](#)).
- *P. ramorum* is confirmed via culture and PCR at a San Marcos, CA (San Diego County) mail order nursery. The survey was part of the California's National *P. ramorum* nursery survey. Trace-back surveys indicated infected camellias originated from the large Los Angeles County wholesale nursery found to be infested (see [Nursery Chronology](#)).
- The USDA APHIS PPO program announces a Sudden Oak Death hotline (1-888-703-4457). Specialists are staffing the APHIS Emergency Operations center in Riverdale, MD to handle nationwide calls from the nursery and landscape industry, news organizations, and the general public in response to positive *P. ramorum* confirmations in two Southern CA nurseries.
- WA issues an emergency order requiring nurseries receiving trees and plants from out-of-state to hold them for 24 hours until WDA is notified.
- AL, DE, MS, FL, GA, UT, TN, WV, LA, MT, VA, KY, and IN impose state-specific *P. ramorum* quarantines as a result of the Southern CA nursery confirmations (see [Nursery Chronology](#)).
- FL identifies three nurseries as having *P. ramorum*-positive plants (see [Nursery Chronology](#)).

### 2/04

- A *P. ramorum* slow-the-spread project in Humboldt County, CA is initiated with the removal and disposal of 77 infected California bay laurel trees in Redway.
- The Gordon and Betty Moore Foundation awards approximately \$2.5 million for *P. ramorum* research to Matteo Garbelotto, Richard Dodd, and Ellen Simms (UCB), and Dave Rizzo (UCD). The three-year grant covers control, resistance, genetics, epidemiology, and other *P. ramorum*-related topics.
- Canadian regulators add the *Hamamelis* and *Fagus* genera to the Canadian *P. ramorum* quarantine. The decision is in response to the UK confirmation of *P. ramorum* on witch hazel and European beech.
- ODA finalizes its interim rule requiring recipients of out-of-state tree and shrub nursery stock deliveries to notify ODA of the shipment within 24 hours for possible inspection of the plants.

#### 1/04

- Six new hosts are added to the APHIS (7 CFR 301.92) and CDFA *P. ramorum* quarantine. The plants and restricted plant parts are: *Camellia sasanqua* (nursery stock and leaves); *Pieris formosa x japonica* (nursery stock, twigs, and leaves); *Pieris floribunda x japonica* (nursery stock, twigs and leaves); *Pieris japonica* (nursery stock, twigs, and leaves); *Viburnum plicatum* var. *tomentosum* (nursery stock and all plant parts); and *Hamamelis virginiana* (nursery stock, twigs, and leaves).
- *P. ramorum* is detected on *Rhododendron* v. Unique at a third WA nursery near Long Beach, Pacific County. The find came as the result of a King County, WA, nursery trace-back survey.

#### 12/03

- *P. ramorum* is found infecting beech, southern and northern red oak, Holm oak, and horse chestnut trees in the Netherlands and UK. In the Netherlands, a single northern red oak (*Quercus rubra*) in a park tests positive for the pathogen. In the UK, a single infected southern red oak (*Quercus falcata*) is detected in Sussex, England. Additionally, at two sites in Cornwall, *P. ramorum* is detected on European beech (*Fagus sylvatica*), Holm oak (*Quercus ilex*) and horse chestnut (*Aesculus hippocastanum*). The beech and horse chestnut show bleeding from the bole, while leaf spots are present on the Holm oak. In all cases, the infected trees are located near *P. ramorum*-infected rhododendrons.
- A retail nursery in Gig Harbor, Pierce County, WA, is found to have *P. ramorum*-positive plants.

#### 11/03

- Witch hazel (*Hamamelis virginiana*) is found to be susceptible to *P. ramorum*. UK DEFRA scientists discover the infected witch hazel in a public garden in Wales, close to *P. ramorum*-infected rhododendron. Koch's postulates have been completed.
- CDFA's revised enforcement guideline policy for CA's *P. ramorum* regulation goes into effect. The revisions allow unrestricted movement of host plants and most nursery stock within the quarantined counties. Nurseries within the quarantined area shipping out of the regulated area continue to be inspected.
- A new *Phytophthora* species (later named *P. kernoviae*) is identified by researchers at the UK Forestry Commission, Forest Research Agency, while looking for *P. ramorum* in natural settings. The positive isolates are from a large bleeding canker of a mature European beech tree in southwest England. It also affects rhododendron (*Rhododendron* spp.).

### 10/03

- The systemic fungicide AGRI-FOS(R) and Pentra Bark surfactant are approved by the California Department of Pesticide Regulation to treat individual oak and tanoak trees at high-risk of contracting *P. ramorum*.
- *P. ramorum* is found approximately 10 miles north of CA's San Luis Obispo County line near Plaskett Creek, extending the southernmost known infested area by about 15 miles.
- CA, OR, WA, the USDA, and Canada agree to [protocols to be used by USDA APHIS and the states to respond to new](#) *P. ramorum* nursery detections (outside of California's 12-county regulated area).

### 9/03

- *P. ramorum* was detected on two containerized *Camellia sasanqua* plants at a retail nursery in Placer County, CA. The finding is the result of a trace-forward investigation from a Stanislaus County, CA nursery.
- A European A2 *P. ramorum* mating type is found in Europe. European researchers identified the A2 *P. ramorum* mating type isolate from a Belgian nursery.
- Canada releases the [9th revision](#) of its *P. ramorum* regulations.

### 8/03

- *P. ramorum* is detected on containerized yew (*Taxus baecata*) saplings at a medium-sized garden center in northwest England.
- The European population, A1 *P. ramorum* mating type isolate is found for the first time in North America. Plants from sister nurseries in OR and WA were found to have both the North American, A2 mating type and the European population A1 mating type. This is also the first time both mating types have been found in close proximity to one another in the US.
- The [ODA adopts an emergency rule](#) that requires all recipients of out-of-state tree and shrub nursery stock to notify ODA of the shipment for possible inspection of the plants.

### 7/03

- ODA recalls camellia plants sold in OR that originated from a *P. ramorum*-positive nursery in Stanislaus County, CA.
- WA holds its first Sudden Oak Death informational meeting at Washington State University, Puyallup Research and Extension Center.
- A new diagnostic guide, "[Sudden Oak Death and Associated Diseases Caused by \*Phytophthora ramorum\*](#)" by Davidson et al., is published by the Plant Management Network, Plant Health Progress.
- CDFA issues a [Pest Exclusion Advisory](#) requiring incoming shipments of *P. ramorum* hosts and associated plants from OR, WA, and BC to be visually inspected by CA county inspectors at the destination location before being released for sale.

### 6/03

- *P. ramorum* is detected on rhododendron container plants at a nursery in King County, WA. This is the first detection of *P. ramorum* in the state.
- *P. ramorum* (European population, A1 mating type) is detected on a rhododendron container plant at a nursery in Greater Vancouver, BC.
- The Czech Republic implements a quarantine for *P. ramorum*-susceptible plants from the US, Germany, and the Netherlands.
- CDF approves the Santa Cruz County Hazard Tree Removal Program, granting the county \$224,000 to complete the removal of 650 previously identified hazardous trees this summer.
- *Camellia sasanqua* is found to have *P. ramorum* at a Sacramento County, CA nursery. It is intercepted via a trace-forward investigation.
- *P. ramorum* is detected on *Camellia sasanqua* container plants at two nursery locations in Jackson County, OR, as the result of trace-forward investigation from an infested Stanislaus County, CA nursery.

## 5/03

- "Sudden Oak Death, endangering California and Oregon forest ecosystems," a review article by Dave Rizzo (UCD) and Matteo Garbelotto (UCB), is published in the May 2003 issue of *Frontiers of Ecology and the Environment* (Ecological Society of America, issue 4, volume 1, May 2003).
- *P. ramorum* is confirmed on containerized *Viburnum bodanantense*, *Pieris japonica* and *Pieris japonica x formosa*, *Viburnum plicatum tomentosum*, and *Rhododendron 'Unique'* at a nursery in Clackamas County, OR.
- In a letter to USDA Secretary Anne Venneman, OR formally requests exemption from the interim federal regulations for *P. ramorum*. OR is requesting stricter regulations for *P. ramorum* to prevent pathogen spread into the state.
- *P. ramorum* is detected in four CA nurseries in Stanislaus, Alameda, Santa Cruz, and Marin Counties. The nursery in Stanislaus County is in the Central Valley, approximately 100 miles east of the closest known infested area.
- A Sudden Oak Death collection yard opens at the Marin Resource Recovery Center, San Rafael, CA. The project, dubbed "SODBusters," aims at preventing pathogen spread through proper handling, and disposal when necessary, of infested plant debris.

## 4/03

- A Sudden Oak Death Tribal Summit is held at Blue Lake Rancheria, Blue Lake, CA. The meeting brings together tribal and agency land managers, tribal members, and Sudden Oak Death researchers to discuss issues of particular concern to tribal members. Tribal research priorities, regulatory issues, and information needs are discussed.
- The on-line symposium "Sudden Oak Death - How Concerned Should You Be?" is hosted by the American Phytopathological Society. Over 3000 site visitors from 46 countries participate.
- *Kalmia latifolia* and *Vaccinium vitis-idaea* are reported as susceptible to *P. ramorum* in the [revised pest risk assessment](#) for *P. ramorum* released by the UK.
- OR holds its first statewide informational meeting and strategic planning session on *P. ramorum* entitled "Perspective on the Sudden Oak Death Syndrome: Risks to Oregon Agriculture and Forestry," at OSU in Corvallis.
- The first report of *P. ramorum* on *Camellia japonica* and *Viburnum tinus* in the US is confirmed at a nursery in Marin County, CA. The symptomatic material was kept adjacent to a stand of *P. ramorum*-infected California bay laurel trees.
- The UK has 264 *P. ramorum* outbreaks recorded on *rhododendron*, *viburnum*, *Camellia japonica*, *Kalmia latifolia*, *Pieris japonica*, *Pieris Formosa* var. *forestii*,



*Arbutus*, and *Syringa*. Some of the findings have been in large gardens open to the public and associated with plant nurseries or garden centers. An intensive survey is ongoing.

### 3/03

- *P. ramorum* is isolated from a potted *Pieris japonica* growing outside under an infested California bay laurel. This is the first find of infested *Pieris japonica* in the US.

### 1/03

- *P. ramorum* is isolated from *Camellia* in a UK nursery.
- *P. ramorum* is isolated from grand fir, *Abies grandis*, Christmas trees at a Santa Clara County, CA Christmas tree plantation.

### 12/02

- *P. ramorum* is isolated from over 150 nurseries in the UK. France, Belgium, the Netherlands, Sweden, Germany, and other European countries also report widespread nursery infestations.
- The first Sudden Oak Death Science Symposium is held in Monterey, CA. Over 300 people attend. Eight new plants associated with *P. ramorum* are announced: California Hazel, poison oak, salmonberry, cascara, Victorian box, and *Pieris* (the last from nursery stock in UK).
- Everett Hansen (OSU), along with Rizzo (UCD) and Garbelotto (UCB), name another new *Phytophthora* found on dying oaks and infecting leaves of California bay laurel. *Phytophthora nemorosa* has a similar geographic range as *P. ramorum* but is considered less virulent.
- The *P. ramorum* isolates from Europe are determined to be a different mating type from those isolated in North America, indicating that the pathogen did not come from Europe to CA or vice-versa.

### 11/02

- Scientists at the US DOE Joint Genome Institute in Walnut Creek and the Virginia Bioinformatics Institute in Blacksburg are receiving \$3.8 million from federal agencies to decode and study the genomes of *P. ramorum* and *Phytophthora sojae*.
- The EU issues regulations for *P. ramorum* to prevent pathogen spread within the Union as well as the importation of the North American genotype and A2 mating type.

### 10/02

- The CFIA adds a certification program to their *P. ramorum* regulations allowing shipments of field-grown plants into Canada from non-infested counties of CA following inspection.
- *P. ramorum* is found on two shipments of rhododendron in Spain.

## 9/02

- Australia introduces regulations preventing the importation of host species from countries known to have *P. ramorum*.
- CDFA and USDA APHIS add only the affected plant parts of coast redwood and Douglas-fir to state and federal regulations.
- Governor Davis's administration supports Sudden Oak Death research and response with a \$2 million commitment in the 2002/03 CA budget.
- UC researchers confirm coast redwood and Douglas-fir are susceptible to *P. ramorum* by isolating the pathogen from needles and branches.

## 7/02

- Forest trees in Humboldt and Contra Costa Counties, CA, are confirmed to have *P. ramorum*, bringing the number of infested CA counties to 12.

## 5/02

- Two informational meetings are held for resource professionals in Humboldt County, CA. The meetings are hosted by UCCE. About 175 people attend.
- The UK bans imports of plants and wood from infested counties in CA and OR to prevent the spread of *P. ramorum*.

## 4/02

- Poland's *P. ramorum* findings on nursery rhododendron plants are reported to the US.
- England confirms *P. ramorum* findings on *Viburnum tinus* in a nursery setting.
- The scope of infestation includes 15 known host species, 10 confirmed CA counties, and the following eight state parks in CA: Austin Creek State Recreation Area, China Camp State Park, Jack London State Park, Pfeiffer Big Sur State Park, Samuel P. Taylor State Park, Sugarloaf Ridge State Park, Henry Cowell Redwoods State Park, and Mt. Tamalpais State Park.

## 3/02

- The media reports that *P. ramorum* DNA has been detected on maple in Foresthill, Placer County, CA (furthest inland report of *P. ramorum*). Unless samples are cultured, Placer County will not be classified as a regulated county.
- Publication of the scientific data that links *P. ramorum* to Sudden Oak Death in Plant Disease 86: 205-214. 2002. *Phytophthora ramorum* as the cause of extensive mortality of *Quercus* spp. and *Lithocarpus densiflora* in California. D.M. Rizzo, M. Garbelotto, J.M. Davidson, G.W. Slaughter, and S.T. Koike.

## **2/02**

- Assemblypersons Nation and Migden introduce AB2251 to continue CA's Sudden Oak Death program.
- The first of two public hearings is held in Petaluma, CA on the interim APHIS Sudden Oak Death regulations. The second hearing was held shortly after in Riverdale, MD.
- USDA APHIS releases interim federal regulations that will oversee interstate movement of *P. ramorum* host material from the CA counties known to be infested.

## **1/02**

- The media reports that *P. ramorum* has been detected on coast redwood. Unless isolates are cultured from samples, coast redwood will not be classified as a host.

## **12/01**

- Senator Boxer announces \$400,000 in agricultural appropriations for Sudden Oak Death research.

## **11/01**

- Marin County Supervisor Cynthia Murray convenes the second Sudden Oak Death Summit.
- *P. ramorum* is confirmed on the UC Berkeley campus.

## **10/01**

- China Camp Back Ranch Campground closes to remove and destroy about 80 hazardous trees. Park trails have another 70 potentially hazardous trees to remove.
- Alameda and Solano Counties are added to the Zone of Infestation by the CA Board of Forestry after confirmation from CDFA that both counties have

Sudden Oak Death and are now regulated counties.

- California coffeeberry, Toyon, and California honeysuckle are confirmed as new hosts.

#### **9/01**

- The COMTF issues sampling guidelines for *P. ramorum*. CDFA defines and requires "official" samples for regulatory purposes.
- The Legislature passes, and Governor Davis signs, AB 62 (Migden) authorizing funding and spending based on COMTF recommendations. Funds are allocated as follows: monitoring \$440,000; management \$1,796,000 – earmarked largely for affected counties; research \$480,000; education \$221,000; regulation \$420,000; and administration \$243,000.

#### **8/01**

- South Korea imposes a *P. ramorum* quarantine on infested counties in CA and OR, prohibiting the importation of known host species.

#### **7/01**

- Governor Davis and the Legislature provide \$3.586 million to address Sudden Oak Death in the 2001/02 budget.
- OR identifies and confirms *P. ramorum* on 40 acres in Curry County. Infested areas are quarantined and under regulation. Plans for eradication of host material begins.

#### **6/01**

- Senator Boxer introduces a bill in the US Senate calling for \$70 million to address Sudden Oak Death. Congresswoman Woolsey introduces a similar bill in the House of Representatives.

#### **5/01**

- CDFA issues emergency regulations, requiring permits to be issued by an authorized agricultural official before moving *P. ramorum* host plants or material within or from infested areas.
- Researcher Matteo Garbelotto, UC Berkeley, develops a molecular diagnostic tool using PCR to identify the presence of *P. ramorum*.
- *P. ramorum* is recovered from madrone and bay laurel.

#### **4/01**

- The Board of Forestry and Fire Protection passes a resolution declaring a "Zone of Infestation" for the counties of Marin, Monterey, Napa, San Mateo,

Santa Clara, Santa Cruz, and Sonoma. In July 2001, the zone is expanded to include Mendocino County after confirmation by CDFA.

- The new *Phytophthora* is formally named *Phytophthora ramorum* in Mycological Research 105(10): 1155-1165. 2001. *Phytophthora ramorum* sp. nov: a new pathogen on *Rhododendron* and *Viburnum*. Werres S., R. Marwitz, W.A. Man in 't Veld, A.W. De Cock, P.J.M. Bonants, M. De Weerd, K. Themann, E. Ilieva, and R.P. Baayen.

### 3/01

- Canada issues a quarantine against CA for the new *Phytophthora*.
- OR's emergency quarantine becomes permanent.

### 2/01

- Researchers recover the new *Phytophthora* from rainwater collected beneath coast live oak stem infections and from soil collected around diseased coast live oak.
- Huckleberry and Shreve's oak are confirmed as hosts of the new *Phytophthora*.

### 1/01

- The new *Phytophthora* associated with dying oaks is recovered from rhododendron container plants in a Santa Cruz, CA nursery.
- OR bans the new *Phytophthora*'s host plants and other plant products coming from CA unless they have been treated. This emergency rule applies for 90 days.
- The Federal government appropriates \$3.5 million for Sudden Oak Death research and monitoring.

### 12/00

- State legislators introduce bills to establish a statewide program for Sudden Oak Death: SB31 (Chesbro); AB53 (Wiggins); AB62 (Migden); and ACR (Nation).

### 11/00

- Clive Brasier of the UK Forestry Commission recognizes that an unknown *Phytophthora* from rhododendron in Germany and the Netherlands, that had been originally isolated in 1993/94, appears identical to the new *Phytophthora* isolated from dying oak trees in CA.
- Marin County Supervisor Cynthia Murray convenes the first Sudden Oak Death Summit. The USDA Undersecretary of Agriculture Jim Lyons pledges

\$2.1 million in federal funding for support. Governor Davis pledges \$100,000 in state funding through CDF.

#### **10/00**

- The first COMTF general member meeting is held at the USDA FS, Pacific Southwest Region Headquarters in Vallejo. The theme for the meeting is "What is Sudden Oak Death?" About 150 people, including press, attend.

#### **8/00**

- The COMTF is formed. It is a voluntary consensus group that brings together public agencies, nonprofit organizations, and private interests to address oak mortality in CA in a comprehensive and coordinated manner.

#### **7/00**

- UC researchers identify the cause of Sudden Oak Death to be a previously unknown *Phytophthora* species.

#### **1999**

- Researchers join efforts in analyzing increased oak and tanoak mortality levels. The UC system provides \$70,000 in emergency funding and the USDA FS provides \$85,000.

#### **1995**

- Large numbers of tanoaks are observed to be dying in CA's Marin and Santa Cruz Counties.