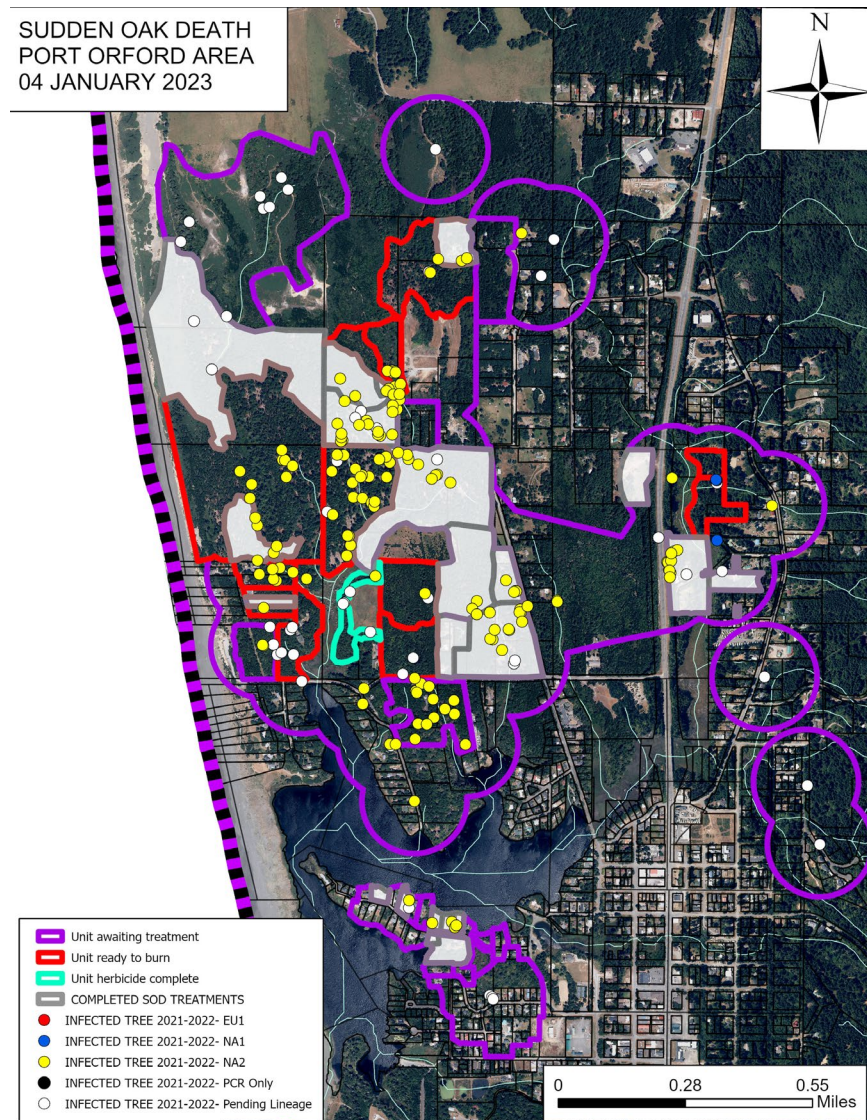


## CALIFORNIA OAK MORTALITY TASK FORCE REPORT FEBRUARY 2023

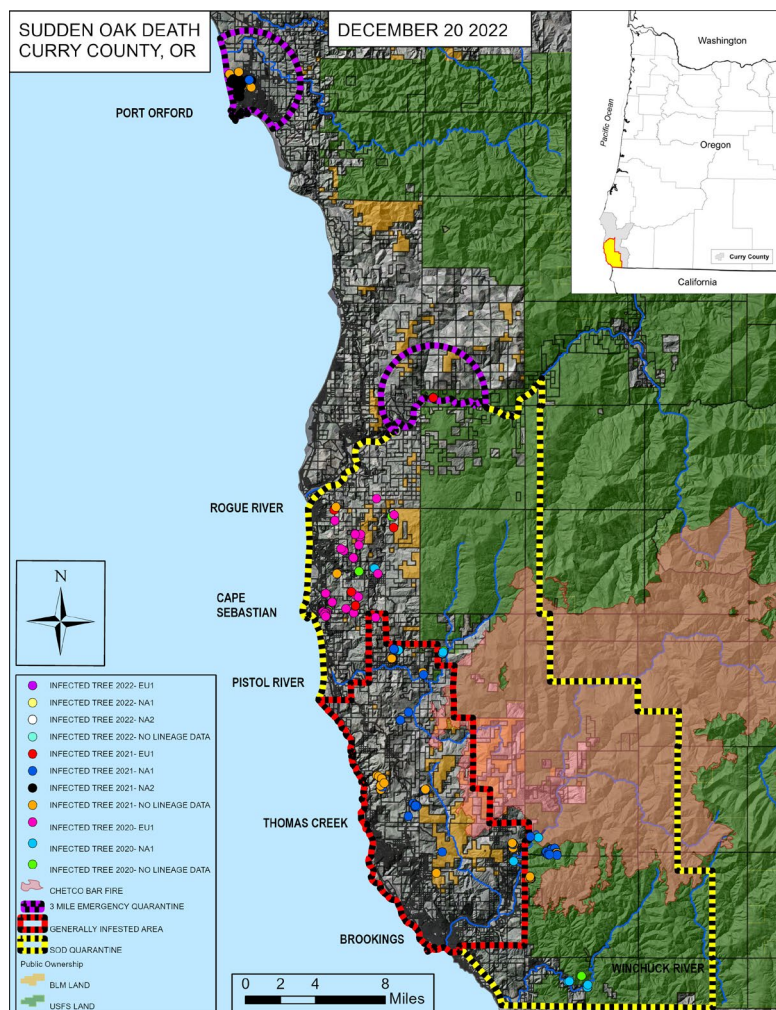
**EDITOR'S NOTE.** IN THIS ISSUE, WE SUMMARIZE THE STATUS OF *PHYTOPHTHORA RAMORUM* IN 2022 FOR OREGON FORESTS, EASTERN U.S. WATERWAYS, NURSERIES AND LANDSCAPES.

### MONITORING AND MANAGEMENT IN OREGON – 2022 YEAR IN REVIEW

In 2022, Oregon Department of Forestry (ODF) continued to aggressively treat all known NA2 *Phytophthora ramorum* infestations with large buffers of 300 - 600 feet in the Port Orford area following detections outside of the sudden oak death (SOD) quarantine in 2021 (Fig. 1). No new *P. ramorum* infestations were detected outside the SOD quarantine Area in 2022 (Fig. 2, page 2). From 2001 through 2022, eradication treatments have been completed on more than 8,200 acres in Oregon at an estimated cost of over \$35 million.



**Figure 1. Status of treatments of the NA2 *P. ramorum* infestations near Port Orford, Oregon.**



**Figure 2. *P. ramorum* infestations by year in Oregon. The SOD quarantine area is noted in yellow and black. An emergency quarantine for the Port Orford infestation and for an EU1 detection in 2021 is noted in violet and black.**

To monitor disease spread and detect new infestations, Oregon SOD staff conduct multiple surveys throughout the year, including aerial, ground-based transects, and stream monitoring. 2022 saw the return of the annual fixed-wing aerial survey for the SOD Program, covering over 420,000 acres, which had been canceled in 2020 and 2021 due to COVID-19 safety concerns and lack of available personnel and aircraft. Oregon Department of Forestry (ODF) and US Forest Service (USFS) surveyors flew, on a 2-mile grid pattern, from the California border to the Curry/Coos County line, to take in the 3-mile emergency quarantine established last year in Port Orford. Other [SOD survey and detection](#) efforts continued in and adjacent to the SOD quarantine area throughout 2022 including monitoring 60 stream bait sites, aerial imagery interpretation of 379,000 acres, and 469 acres of ground transect surveys for the [harvesting of disease-free tanoak](#). Tanoak harvest is only allowed by landowner petition to Oregon Department of Agriculture for a special permit under OAR 603-052-1230, Oregon's *P. ramorum* quarantine.

Since 2001, Oregon's SOD Program has relied on an interagency team to continue to slow the spread of *P. ramorum* through early detection and treatment of infected and nearby host plants.



Treatments include cutting and burning infected and potentially exposed host material, primarily tanoak. For more information contact Sarah Navarro, [Sarah.Navarro@usda.gov](mailto:Sarah.Navarro@usda.gov).

### MONITORING – EASTERN U.S. STREAM SURVEY

In 2022, ten eastern states (AL, FL, GA, IL, MD, MS, NC, PA, SC, and TX) participated in the USDA Forest Service, Cooperative Sudden Oak Death Early Detection Stream Survey (Table 1). A total of 650 bait samples were collected from 65 streams. Polymerase chain reaction (PCR) analysis of the samples detected *P. ramorum* from three streams in AL and one stream in SC. The positive streams in AL are associated with nurseries previously positive for *P. ramorum*. The SC stream is a first detection and is not known to be associated with a nursery. The watershed, comprising a residential neighborhood and streamside riparian vegetation, is being surveyed for *P. ramorum*. All samples collected so far have been negative. Additional sampling is planned.

For the last four years (2019-2022), *P. ramorum* has been detected from eight streams in four states: five streams in AL, one stream in MS, one stream in NC, and one stream in SC (Table 2). In some of these previously positive streams, the pathogen has been present for longer than ten years.

**Table 1. Number of streams surveyed in eastern states for USDA Forest Service, Cooperative Sudden Oak Death Early Detection Stream Survey in 2022.**

Year	AL	FL	GA	IL	MD	MS	NC	PA	SC	TX	Total
2022	9	3	10	7	9	5	5	6	7	4	65

**Table 2. Streams in eastern states positive for *P. ramorum* from USDA Forest Service, Cooperative Sudden Oak Death Early Detection Stream Surveys from 2019 to 2022.**

Stream	AL-a	AL-b	AL-c	AL-d	AL-e	MS	NC	SC	Total
2019	+	+	+	+	+	+	+	-	7
2020	-	-	-	-	-	-	-	-	0
2021	+	-	+	-	-	-	-	-	2
2022	-	-	+	+	+	-	-	+	4

For more information contact Jaesoon Hwang, [jaesoon.hwang@usda.gov](mailto:jaesoon.hwang@usda.gov) or Angel Saavedra, [angel.saavedra@usda.gov](mailto:angel.saavedra@usda.gov).

### FUNDING - THE “FARM BILL”

For FY23, Plant Protection Act’s Section 7721 (formerly called the Farm Bill) will support \$642,775 for sudden oak death (*P. ramorum*) and related species projects. The work will be conducted in 15 states, and nationally, for survey, diagnostics, mitigation, probability modeling, genetic analysis, and outreach. For more information on FY23 funding under the Plant Protection Act’s Section 7721, see the USDA Animal and Plant Health Inspection Service (APHIS) website [www.aphis.usda.gov/ppa-projects](http://www.aphis.usda.gov/ppa-projects).





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**NURSERIES AND MANAGED LANDSCAPES - 2022 YEAR IN REVIEW**

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**USDA Animal and Plant Health Inspection Service (APHIS), Plant Protection and Quarantine (PPQ) *Phytophthora ramorum* Program 2022 Summary.** In 2022, the USDA APHIS, PPQ *P. ramorum* Program supported compliance activities, diagnostics, and surveys in 25 states. *P. ramorum* was detected at 18 different establishments: 12 were new and six were previously positive (see Table 3). Confirmed positive samples were collected at interstate shipping nurseries, at intrastate shipping nurseries including big box stores, a small botanical garden and four residential locations.

**Table 3. Summary of establishment by type within the U.S. with APHIS confirmed positive detections of *P. ramorum* in 2022.**

Establishment Type	Number First Confirmed in 2022	Number Previously +	Total Number Nurseries
Big Box	3	0	3
Other Intrastate Nurseries	2	1	3
Residential/ Botanical Garden	5	0	5
Interstate shipper	2	5	7
Total	12	6	18

More tables and figures for 2022 interceptions are available [here](#). For more information contact Betsy Randall-Schadel, [betsy.randall-schadel@usda.gov](mailto:betsy.randall-schadel@usda.gov).

**California Department of Agriculture *P. ramorum* Nursery Program 2022 summary report.**

The California Department of Food and Agriculture (CDFA) receives funding from the United States Department of Agriculture (USDA) to administer the cooperative *P. ramorum* program. The CDFA assists and reimburses the county agricultural commissioners as they enforce Federal Domestic Quarantine 7 CFR 301.92 and California Code of Regulations 3700 regulations at the 311 establishments regulated for *P. ramorum* in California (see Table 4). Program funding allocated to the CDFA for the *P. ramorum* program was reduced to \$1,308,771 for fiscal year 2022-2023.

**Establishments Under Compliance for *P. ramorum* in California**

Establishment Type	Number of Establishments
Host/Nonhost Nursery Stock in Soil	186
Greenery, Garland, and Wreaths	8
Soil	1
Tree Farms	11
Wood and Wood Products, Green Waste Origin Facility, Compost Facility, Green Waste Transporter	105
<b>Total</b>	<b>311</b>

**Table 4. Number of establishments inspected for *P. ramorum* in California in 2022.**

Approximately 7,200 *P. ramorum* program regulatory samples were submitted to the CDFA Plant Pest Diagnostics Laboratory for processing in 2022. No samples were determined to be positive for *P. ramorum* in 2022 (Table 5).

***P. ramorum*-Positive Nurseries by Year in California**

Year	Nonquarantine Counties		Quarantine Counties		Total
	Production	Retail	Production	Retail	
<b>2022</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
2021	1		2		3
2020	2		3		5
2019	2	3	5	5	15
2018	2	3	2	4	11
2017	1	3	5	7	16
2016	1			1	2

**Table 5. *P. ramorum* detections in nurseries from 2016 to 2022 in California.**

In 2022, three nurseries that were previously positive and are receiving enhanced biannual inspections completed the required six negative inspections necessary to be released from the enhanced inspection portion of the program and will revert to annual inspections in 2023. There are currently five California nurseries receiving enhanced biannual inspections. For more information contact Carolyn Lambert, [Carolyn.Lambert@cdfa.ca.gov](mailto:Carolyn.Lambert@cdfa.ca.gov).

**Oregon Department of Agriculture *P. ramorum* Nursery Program update.**

In 2022, the Oregon Department of Agriculture (ODA) *Phytophthora ramorum* Nursery Program worked with six interstate shippers under federal compliance agreements (7 CFR 301.92). The nurseries are in the following counties: Washington (2), Columbia (1), Linn (1) and Marion (2). The ODA also held a compliance agreement with one intrastate shipper in Clackamas County, which is regulated under Oregon state quarantine requirements (7 CFR 301.92 and OAR 603-052-1230). Table 6 summarizes ODA's results for the work described in this report. Table 7 lists



plant species with *P. ramorum* detections from nurseries under federal and state compliance agreements in 2022.

		Foliar		Water		Soil	
	Survey Type	Sampled	Pr (+)	Sampled	Pr (+)	Sampled	Pr (+)
Spring	Compliance	1,633	1	0	0	0	0
	Trace	6	0	0	0	0	0
	CNP*	19	0	0	0	0	0
Fall	Compliance	1,929	3	0	0	0	0
	Trace	0	0	0	0	0	0
	CNP*	19	3	0	0	0	0
	TOTAL	3,606	7	0	0	0	0

**Table 6. Results from surveys conducted at nurseries under federal and state compliance surveys. \*CNP = Confirmed Nursery Protocol survey.**

Three new nurseries were added to the program between March and June. One new nursery in Washington County was identified from a trace-forward investigation and was subject to its first compliance inspection in spring. The other new nurseries, in Linn and Clackamas Counties, were found to have plants infected with *P. ramorum* during routine annual inspections. The first compliance inspections for both nurseries were conducted in fall 2022.

Spring compliance surveys were completed by the end of May. The ODA tested 1,633 foliar samples for *P. ramorum*, of which one tested positive. The Confirmed Nursery Protocol (CNP) delimitation resulted in an additional 19 foliar samples collected, none of which tested positive. The nursery incinerated all plants in the impacted block on site and removed and replaced the gravel substrate.



**Figures 3 & 4. *P. ramorum* symptoms on *Magnolia grandiflora* plants. The plants were confirmed positive by the ODA plant health laboratory. Photo: Kaitlin Gerber, ODA.**



Genus/Species	Cultivar
<i>Rhododendron</i>	‘multimaculatum’
<i>Viburnum</i> spp.	‘carlesii’
<i>Magnolia grandiflora</i>	

**Table 7. Known regulated plants that were confirmed positive for *P. ramorum* from surveys conducted at nurseries in Oregon under federal and state compliance in 2022.**

Fall compliance surveys were completed by the end of November. The ODA tested 1,929 foliar samples for *P. ramorum*, of which three plants tested positive. One nursery still has compliance inspection results pending. The CNP delimitation work was completed at the two nurseries that tested positive. A total of 19 foliar samples were taken, of which three tested positive. The entire blocks of impacted plants at both nurseries were incinerated to ash on site. One nursery will solarize the impacted ground in summer 2023. The other nursery disinfested the ground and will not place host plants back in the impacted area. A nursery in Washington County fulfilled the CNP requirements and was released from the program in December.

ODA detected the presence of *P. ramorum* at a botanic garden and private residence in Lincoln City, Oregon. In response, ODA and the United States Department of Agriculture, Animal and Plant Health Inspection Service (USDA APHIS), surveyed the neighborhood around the confirmed positive locations. Results are being used to inform a mitigation plan. ODA and USDA APHIS suspect that the pathogen was introduced into Lincoln City through the planting of infested nursery stock several years ago. As a result of this work, western sword fern (*Polystichum munitum*) was confirmed positive for *P. ramorum* by USDA and added to the USDA *P. ramorum* associated host list. For more information, please contact Chris Benemann at [chris.benemann@oda.oregon.gov](mailto:chris.benemann@oda.oregon.gov) or Kaitlin Gerber at [kaitlin.gerber@oda.oregon.gov](mailto:kaitlin.gerber@oda.oregon.gov).

#### **Washington State Department of Agriculture (WSDA) *P. ramorum* program update.**

**Nursery Activity.** WSDA assisted in the required certification sampling for Washington’s only interstate shipping nursery under a federal compliance agreement for *P. ramorum*. Spring and fall surveys were conducted at the nursery. All foliar and water samples were negative in 2022. The nursery is scheduled to be released from the program in 2023.

WSDA inspected four of nine ‘opt-out’ nurseries in 2022. These are nurseries that ‘opted-out’ of the Federal DA-2014-2 regulations and can no longer ship interstate. Host material appeared free of symptoms and no samples were collected. WSDA confirmed the nine ‘opt-out’ nurseries are not shipping interstate.

**Trace-forward Activity.** WSDA conducted four trace-forward investigations from out of state positive nurseries.

- In January 2022, two receiving nurseries in Washington were inspected during a trace-forward from an out-of-state positive nursery. Most host plants had been sold. Remaining plants on site were in good condition.



- In April, four big box stores in Washington were inspected during a trace-forward from an out-of-state positive nursery. Nine samples were collected with results being negative for *P. ramorum*. All other host plants were in good condition.
- In April, seven receiving locations in Washington were inspected during a trace-forward from an out-of-state positive nursery. Sixteen samples were collected. At a residence in Pacific County, a camellia tested positive for *P. ramorum*. A soil sample at the same location also tested positive. The Confirmed Residential Protocol was enacted and required follow-up inspections will occur over the next two years.
- In September and October, WSDA conducted its largest trace-forward ever. Over 160 residential sites received host plants from an out-of-state positive nursery, but complete trace information was only provided for 64 locations. WSDA worked with PPQ personnel in Washington to complete the investigation with the information available. Twenty-five samples were collected at 13 locations. All samples were negative for *P. ramorum*.

## 2022 Sample Summary –Washington State

**Table 8. Total *P. ramorum* regulatory sampling in 2022 in Washington state.**

Total number of regulatory samples collected (all sites)	951
Total number of nursery samples collected	690
Total number of non-nursery samples collected	261
Total number of confirmed positive PLANT samples (2022)	1
Total number of confirmed positive SOIL samples (2022)	1
Total number of confirmed positive WATER samples (2022)	0

### Stream Baiting sampling (WA Department of Natural Resources (DNR) tested by WSDA)

Total number of DNR stream baiting samples collected	70
Total number of DNR confirmed positive water samples	0

For more information contact Scott Brooks, [SBrooks@agr.wa.gov](mailto:SBrooks@agr.wa.gov).

## RELATED RESEARCH

**Antonelli, C.; Biscontri, M.; Tabet, D. and Vettraino, A.M. 2023.** The never-ending presence of *Phytophthora* species in Italian Nurseries. Pathogens. 12(1): 15.  
<https://doi.org/10.3390/pathogens12010015>.

**Jankowiak, R.; Stępniewska, H.; Bilański, P. and Taerum, S.J. 2023.** *Phytophthora* species cause sudden and severe decline of naturally regenerated European beech (*Fagus sylvatica* L.) seedlings. Plant Pathology. Early View. <https://doi.org/10.1111/ppa.13698>.

**Khdiar, M.Y.; Burgess, T.I.; Barber, P.A. and Hardy, G.E.S.J. 2023.** Calcium chelate is as effective as phosphite in controlling Phytophthora root rot in glasshouse trials. Plant Pathology. 72(1): 112-119.





**Loehle, C.; Hulcr, J.; Smith, J.A.; Munro, H.L. and Fox, T. 2023.** Preventing the perfect storm of forest mortality in the United States caused by invasive species. *Journal of Forestry*. 121(1): 104-117.

**Mora-Sala, B.; León, M.; Pérez-Sierra, A. and Abad-Campos, P. 2022.** New reports of *Phytophthora* species in plant nurseries in Spain. *Pathogens*. 11(8): 826.  
<https://doi.org/10.3390/pathogens11080826>