

# Research Needs Assessment for *Phytophthora ramorum* in Nursery & Wildland Environments







# Past Efforts

- Forestry issues (from 2007): pathogen spread, water detection, survival in soil, host resistance, conifer susceptibility, management tools, restoration, etc.
- Nursery issues (including NORS-DUC): stopping the spread, symptomless hosts, root infections, repeat/recurrent nurseries, buffers, fungicides, etc.

# Urban Forestry Research Needs: A Participatory Assessment Process

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## ABSTRACT

New research initiatives focusing on urban ecology and natural resources are underway. Such programs coincide with increased local government action in urban forest planning and management, activities that are enhanced by scientific knowledge. This project used a participatory stakeholder process to explore and understand urban forestry research and technology transfer needs in the Pacific Northwest region of the United States. The approach can be readily used for any geographic region or metropolitan area. A two-phase, abbreviated Delphi process was conducted, inviting input from urban forestry professionals, academics, and agency-based managers. Research issues were identified and prioritized within three themes: urban forest resource, resource management, and community framework. The results serve as a stakeholder relevant research framework to guide science proposals for funding initiatives at regional and national levels. Notable is major support by respondents for a better understanding of the transactional dynamics of human systems and urban natural resources.

**Keywords:** urban forestry, urban ecology, research assessment, Delphi method, Pacific Northwest

project was to assess and compile current research needs in the Pacific Northwest (PNW) region of the United States (including Alaska), based on input from professional and management stakeholders. Results are being used to develop a regional research program that emphasizes applied science.

Periodic assessments of knowledge development and needs are used in a variety of professional and scientific disciplines (such as education, medicine and public health, and atmospheric sciences) to guide and consolidate research activity. A research assessment focuses on fundamental questions for knowledge building concerning resource character and dynamics and social transactions associated with the resource. Such inquiries are potentially generalizable across

**R**ecent demographic projections have called out the probable rapid pace of urbanization in the United States

Regional and national science initiatives increasingly address urban ecology and natural resources. The most recent US For-

# Methods

- Two-round expert Delphi approach: first round generates questions or issues of interest, second round ranks submitted issues
- Reach a larger audience through online surveys
- Two rounds of four simultaneous surveys each: Expert Nursery, Public Nursery, Expert Forestry, and Public Forestry
- Check that our “experts” were not missing any important issues; assess whether there were already-completed research projects that needed to be better advertised





### 2010 *P. ramorum* Research Needs - FORESTRY

Thank you for participating in the 2010 Sudden Oak Death/Phytophthora ramorum Research Needs Assessment, sponsored by the California Oak Mortality Task Force and the USDA-Forest Service Pacific Southwest Research Station. The information collected in this survey will be summarized and presented at the upcoming 2010 COMTF meeting, June 9-10 at Dominican University. **This survey will cover forestry issues only.**

Question	Response
Please list the three (3) most important issues to research regarding <i>P. ramorum</i> <u>in forests</u> .	

(1)

(2)

(3)

What is your professional affiliation with *P. ramorum*? (choose all that apply)

- ☐ academic/non-profit  
☐ management/industry  
☐ regulatory/ government (local, state, or federal)

Please share any professional associations you are a member of which may be available for research and educational collaborations.

Submit Answers

Date	forest issue 1	forest issue 2	forest issue 3	affiliation	associations
16-Mar-10	ecological effects of tanoak/oak removal	restoration of degraded stands	effects of management treatments such as species removals, thinning, fire, etc.	academic/non-profit	SAF
16-Mar-10	Improved diagnostic methods for use in the forest.	The need to research new methods of biological control. Perhaps there are viruses that can be transm		academic/non-profit	
16-Mar-10	A treatment for already infected individual trees in the landscape. Ideally the treatment would exte	The effectiveness of the current Agri-Fos treatment recommendation.		management/industry	ISA
16-Mar-10	Forest health via thinning and prescribed burning.	Incentivizing forest thinning of tanoaks via the development of tanoak lumber markets.	Educating the public as to the true state of P. ramorum in America today and its potential future im	management/industry	
16-Mar-10	Ecological impacts: higher trophic level impacts, woodrats, owls, deer, etc.	Succession, what will be next? What can be a good replacement for oaks and tanoaks?	slowing the spread both north and south. Containment.	academic/non-profit	UCDavis
16-Mar-10	Utilization of SOD infected trees	Silvicultural management approaches for SOD infected stands	Control measures in relation to quarantine rules etc.	academic/non-profit	Ph.D., Registered Professional Forester, Professor, Dept. Head, Board of Forestry member, NRM Dept.
16-Mar-10	mitigation of impacts in heavily impacted forests	identification/breeding of resistant tanoak genotypes	identification of community types/stand structures that are resistant to SOD	academic/non-profit	
16-Mar-10	likelihood of transmission from residential landscapes into adjacent forested landscapes (i.e., how	whether differences in seasonal climate patterns between U.S. West Coast and other apparently suscep	Are there really any epidemiological equivalents to tanoak & CA bay laurel elsewhere in the U.S., wo	academic/non-profit regulatory/ government (local state or federal)	Society for Risk Analysis
16-Mar-10	Containment. How do we prevent SOD from infecting every tan oak and oak in the Western US?	Development of resistant cultivars.	Can fungus or other biological mechanisms (non-chemical) be used to our advantage for forest cleanup	management/industry	California Contractors Licensing Board
16-Mar-10	Loss of biodiversity and ecosystem function in effected forests.	Techniques for control and eradication.	Socio-Economics of P. ramorum.	academic/non-profit	I'm listing one I figured no one else would mention....Northwest Scientific Association and the jour
16-Mar-10	Sporulation production per seasonal influence. Spore collection buckets on our property in treated a	Thinning, herbicide, prescribed burning influence and cost effectiveness in reducing spread of infec	Influence of Armillaria melleosa, honey mushroom, pre-infection of tan oak stands influence on SOD inf	management/industry	Private landowner in South Humboldt Co. with test plots on my property working with Yana Valacovic a
17-Mar-10	We know a lot about the pathogen itself (epidemiology, population genetics) but still very little ab	We don't know much at all about the levels of natural resistance to the pathogen in keystone species	How can we apply knowledge about 2 in actual management decision making?	academic/non-profit	
17-Mar-10	Need a new updated assessment of risk of establishment in eastern forests	Need to evaluate possible movement via contaminated wood	Need to evaluate watershed movement in the eastern forests	regulatory/ government (local state or federal)	American Phytopathological Society, National Plant Board, Horticultural Inspection Society, NAPPO
17-Mar-10	More/better assessments of the potential impacts of P. ramorum in eastern deciduous forests.			academic/non-profit	
17-Mar-10	Susceptibility of mature trees of eastern forests to P. ramorum	Low temperature survival of P. ramorum in eastern forests		regulatory/ government (local	

**Please refer to the handout for the full list of Forestry and Nursery issues that were submitted during the Round 1 surveys.**

Final Categories / Proposed Topics / Second Sort / **First Sort** / PUBLIC NURSERY 4.5.2010 /





## PUBLIC 2010 RNA - Nursery ROUND 2

This is Round 2 of the 2010 Research Needs Assessment for *Phytophthora ramorum* in Nursery Environments. The information collected in this survey will be summarized, and the results will be published and presented at the upcoming 2010 COMTF meeting, June 8-11, at Dominican University. **This survey covers nursery issues only.**

Question	Response
<p>For each of the broad categories listed below, please indicate what level of priority it should have in future research efforts: Very High, High, Mid, Low, or Very Low. You may choose the same priority level for multiple categories. To see the types of research questions that fall under a particular category heading, click on the underlined category name for a linked page of examples.</p>	
<u>Best Management Practices</u>	<input type="radio"/> Very High <input type="radio"/> High <input type="radio"/> Mid <input type="radio"/> Low <input type="radio"/> Very Low
<u>Diagnostics and Detection</u>	<input type="radio"/> Very High <input type="radio"/> High <input type="radio"/> Mid <input type="radio"/> Low <input type="radio"/> Very Low
<u>Distribution</u>	<input type="radio"/> Very High <input type="radio"/> High <input type="radio"/> Mid <input type="radio"/> Low <input type="radio"/> Very Low
<u>Eradication &amp; Remediation</u>	<input type="radio"/> Very High <input type="radio"/> High <input type="radio"/> Mid <input type="radio"/> Low <input type="radio"/> Very Low
<u>Hosts &amp; Symptoms (including latency)</u>	<input type="radio"/> Very High <input type="radio"/> High <input type="radio"/> Mid <input type="radio"/> Low <input type="radio"/> Very Low
<u>Pathogen Characterization &amp; Spread</u>	<input type="radio"/> Very High <input type="radio"/> High <input type="radio"/> Mid <input type="radio"/> Low <input type="radio"/> Very Low
<u>Potting Media &amp; Soil Under Pots</u>	<input type="radio"/> Very High <input type="radio"/> High <input type="radio"/> Mid <input type="radio"/> Low <input type="radio"/> Very Low
<u>Regulations</u>	<input type="radio"/> Very High <input type="radio"/> High <input type="radio"/> Mid <input type="radio"/> Low <input type="radio"/> Very Low
<u>Resistance</u>	<input type="radio"/> Very High <input type="radio"/> High <input type="radio"/> Mid <input type="radio"/> Low <input type="radio"/> Very Low
<u>Water</u>	<input type="radio"/> Very High <input type="radio"/> High <input type="radio"/> Mid <input type="radio"/> Low <input type="radio"/> Very Low

Please use this space to clarify any of your choices above or to provide us comments and questions.

Date	BMP	Diagnostics and Detection	Distribution	Economic Impacts	Eradication & Remediation	Hosts	Pathogen	Soil	Regs	Resistance	Water
28-Apr-10	Very High	High	Mid	Mid	Very High	High	High	High	Mid	High	High
28-Apr-10	Very High	Very High	Mid	Mid	Very High	High	Very High	Very High	High	High	Very High
28-Apr-10	Very High	Very High	Low	Mid	Very High	High	Very High	Low	Mid	Low	Low
28-Apr-10	Very High	High	Mid	High	Mid	High	High	High	Mid	High	Very High
28-Apr-10	Very High	Very High	High	Mid	Very High	Mid	High		Low	High	Very High
28-Apr-10	Very High	Very High	Low	Low	Very High	Low	High	Very High	Mid	Mid	Low
28-Apr-10	Very High	Low	Mid	Low	High	Mid	High	High	Low	Low	Mid
28-Apr-10	Very High	High	High	Very High	Mid	Low	Low	High	High	Very High	Very High
29-Apr-10	Very High	Very High	Mid	Mid		High	Very High	Very High	Mid	Mid	Very High
29-Apr-10	High	Mid	Mid	High	Very High	Mid	High	Low	Mid	Low	Mid

	Forestry	Nursery	A	M	G
Invited experts	42	47	26	28	31
Round 1	29 (69%)	32 (68%)			
Round 2	23 (55%)	27 (57%)			

Total responses	<b>410</b>	
	<b>186</b> Round 1	<b>224</b> Round 2
	<b>302</b> Unique responses	<b>108</b> Repeat responses
	<b>82</b> Expert	<b>297</b> Public
38% Academic	25% Management <sup>1</sup>	44% Government

(1) Except for Public Nursery Round 1 where only 19% were from the industry/management category



# Comments and qualifications

- Overlap among categories
- Misplaced issues within categories
- Specific research questions within a category that were not deemed suitable
- Absence of certain categories (e.g., education, hazard trees, etc.)
- Some categories common to both nurseries and forestry
- Multiple issues should be addressed simultaneously