

# ***Phytophthora ramorum* Research and Control in North Coastal California<sup>1</sup>**

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## **Abstract**

A number of factors distinguish the north coast counties of California (Mendocino, Humboldt, and Del Norte Counties) from other counties currently infested by, or vulnerable to, *Phytophthora ramorum*. The North Coast is still largely uninfested, with limited infections in southern Humboldt and central Mendocino Counties, but at high risk for introduction and spread of the pathogen, primarily because of climate and vegetation. Accordingly, cooperators from the University of California Cooperative Extension, the University of California, Davis, and the California Department of Forestry and Fire Prevention have launched an integrated, adaptive monitoring and treatment program for the North Coast that involves implementation of a variety of research and treatment approaches.

Over the past year, research efforts have focused on a sampling of over 75 heavily visited landmark areas, trails, campgrounds in state and county parks, and recreation areas known to have year-round use from central Mendocino County to the Oregon border. The first 100 m of each selected trail were surveyed out to 10 m from each side of the trail; symptomatic vegetation was sampled and surveyors noted sampled tree/shrub locations and selected environmental variables. For parking lots and campgrounds, all vegetation within the campground or parking lot area, as well as within a 10-m strip around the perimeter, was surveyed. *P. ramorum* was recovered from only two locations (three percent) near the known infestation in Redway, one along a trail and one beside a parking lot.

An additional research project involves continuous sampling of 31 strategically located streams from south of the Anderson Valley in Mendocino County to the Smith River near Oregon. In Mendocino County, the pathogen was recovered from one stream with no forest infestation immediately adjacent but approximately three km upstream; in Humboldt County, the pathogen was recovered from two streams that were near to the previously known Redway infestation (one with infestation adjacent to the stream, the other downstream approximately eight km). Stream monitoring plans for 2005 include the addition of eight to ten new stream sites near Redway and Garberville, three to four new stream sites on tributaries to the Klamath River, one to two new sites on tributaries to the Mattole River in southwestern Humboldt County, and one new site on the South Fork Winchuk River near Oregon.

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Treatment of the infested area in Humboldt County near Redway has involved tree removal and site sanitation in an effort to reduce inoculum load and slow the spread of the pathogen. The pathogen was recovered post-treatment in the South Fork Eel River downstream from Redway, demonstrating the persistence of the infestation owing to several factors, such as incomplete cooperation from affected landowners, potential as-yet-unknown infected trees in the area, and possible pathogen presence in site soil. Future treatment options for the Redway sites, and an additional infested area near Garberville, will focus on a comparative study of other methods, including those that do not require whole-tree removal, such as pruning lower branches and chemical treatment. Ten-to-twenty-meter treatment buffers will also be installed to aid suppression efforts, where landowner permission can be obtained.

In addition to these research and treatment efforts, intensive education and outreach efforts, targeting a variety of interested parties and stakeholders throughout the North Coast area, have been completed and are in on-going development.