

2006 Pilot Survey for *Phytophthora ramorum* in Forest Streams in the USA

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Phytophthora species are well adapted to aquatic environments. Consequently, occurrence and distribution of *Phytophthora* spp., including *P. ramorum*, have been studied in waterways in various environmental settings worldwide using baiting (with plant tissues from a wide variety of plants species) and filtration methods. Monitoring forest streams for *P. ramorum* in high-risk regions should afford an opportunity to survey larger land areas with greater efficiency and at lower cost than is possible with traditional terrestrial survey techniques. However, these methods need to be tested on a large scale for possible use in the many states cooperating in the National *Phytophthora ramorum* Early Detection Survey for Forests in the USA.

In 2006, a pilot survey was conducted in 11 states in the USA with high-risk forests, including states where *P. ramorum* is known to be established in forests and ornamental crop nurseries (CA, OR), states where *P. ramorum* has been detected only in association with ornamental plants in nurseries or landscapes (GA, MD, NC, PA, TN, VA, WA), and states where *P. ramorum* has yet to be detected (KY, WV). Cooperators in each state were asked to sample 5 to 10 perennial streams that drained watersheds of at least 2000 ha in high-risk areas, with high risk determined by host plant composition, climate, and potential pathways of *P. ramorum* introduction. Streams were sampled once per month for five consecutive months between spring and fall (e.g., May to Sept) by floating four detached leaves of *Rhododendron* spp. in a mesh bag in the current for a 2-week period. After retrieval, symptomatic leaf tissues were assayed for the presence of *P. ramorum* by nested or real-time PCR and for the presence of *Phytophthora* spp. by PCR, ELISA, or culturing on a medium selective for *Phytophthora* spp. (e.g., PARPH-V8).

P. ramorum was detected only in regulated areas in CA and OR and in one stream draining an ornamental crop nursery in WA where *P. ramorum* had been confirmed twice previously. However, other species of *Phytophthora* frequently were detected in *P. ramorum*-negative streams, which demonstrated the overall effectiveness of the stream survey method. The minimum detection threshold for *P. ramorum* by baiting with rhododendron leaves is not known. Data from the survey still are being collected and summarized at this time (Oct 2006). At the Symposium (Mar 2007), we will report the following data for each state in the survey: the percentage of baits retrieved, the percentage of successful detections of *Phytophthora* spp., and the percentage of successful detections of *P. ramorum* from streams that were positive at least once. In addition, we will discuss the relative success of each diagnostic method. The results of this pilot survey ensure that stream baiting will be used in the 2007 National *Phytophthora ramorum* Early Detection Survey for Forests in the USA.