

# Reducing the Spread of *Phytophthora ramorum* on the Redwood Nature Trail, Rogue River-Siskiyou National Forest, Curry County, Oregon: A Case Study<sup>1</sup>

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## Abstract

In late August 2009, a 20.3 cm (8 in) diameter tanoak (*Notholithocarpus densiflorus* (Hook. & Arn.) Manos, Cannon & S.H. Oh) adjacent to a popular hiking trail on the Rogue River-Siskiyou National Forest was found infected with *Phytophthora ramorum*. The trail was immediately closed to the public. An eradication treatment consisting of injecting herbicide and cutting, piling, and burning tanoaks and other selected hosts in a 91.4 m (300 ft) radius around the infected tanoak was prescribed and completed by early winter.

Close to 487.7 m (1600 ft) of trail lies within or on the boundary of the treatment area while approximately 61 m (200 ft) of trail pass through the heart of the infested zone. Knowing the potential for *P. ramorum* to persist in soils after treatment, options to reduce the risk of human-assisted spread of the pathogen via infested trail soil were discussed. Closing the trail permanently was not considered a viable option. A previous study suggested that, due to their antimicrobial activity, western red cedar (*Thuja plicata* Donn ex D. Don) heartwood chips placed on trails could help limit the number of *P. ramorum* spores in soils and the potential for new infections from splash dispersal. As a result, a 10.2 cm (4 in) thick layer of western redcedar heartwood chips was placed on the trailhead and through the center of the treated area. The trail was reopened to public use after the chip treatment was completed.

In October 2009, after herbicide treatment, but prior to cutting and burning, soil samples were collected at 11 locations on the trail in the vicinity of the infected tree and near the trailhead. Samples were collected at these same locations in February 2010 after the eradication treatment was completed and again in May and July 2010. The western redcedar heartwood chips were applied immediately after the July soil collection. Soil samples were collected again in November 2010 and in March and June 2011.

Soil samples from the trail surface were wetted and baited for *P. ramorum* at Oregon State University. *Phytophthora ramorum* was recovered from at least one of the 11 samples on all occasions except July 2010 and June 2011. The number of *P. ramorum*-positive soil samples from each date tested declined from 2 out of 11 (October 2009), 5 out of 11 (February 2010), and 6 out of 11 (May 2010) samples collected before-chip treatment to 1 out of 11 in November 2010 and 1 out of 11 samples in March 2011 after-chip treatment. All *P. ramorum*-positive samples were found within approximately 7.6 m (25 ft) from the infected tree. The majority of positive soil samples were collected within what would have been the dripline of the infected tree or “down trail” from there.

The presence of *P. ramorum* in trail soil appears to have been reduced in the year after chip treatment. Recently, additional *P. ramorum* infections have been detected near the trail. Wood chip depth has also been greatly reduced, particularly where the trail narrows on steep side slopes. Additional treatments are being discussed and monitoring will continue.

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