



United States  
Department of Agriculture

Forest Service

Shasta-Trinity National Forest  
Headquarters

Forest Health Protection,  
Northern California Shared  
Service Area

3644 Avtech Parkway  
Redding, CA 96002  
(530) 226-2500  
(530) 226-2490 – TDD  
[www.fs.fed.us/r5/shastatrinity](http://www.fs.fed.us/r5/shastatrinity)

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**Route To:**

**Subject:** Evaluation of Port-Orford-cedar Root Disease Situation At Sanger Lake (FHP Report No. N09-01)

**To:** Tyrone Kelley, Forest Supervisor, Six Rivers National Forest  
Scott Conroy, Forest Supervisor, Rogue River-Siskiyou National Forest

On October 16, 2008, Pete Angwin (Plant Pathologist), Frank Betlejewski (Interregional Port-Orford-cedar Program Manager) and Joel Egan (Entomologist) and Ken Neeley (Smith River National Recreation Area) visited Sanger Lake to investigate a potential new Port-Orford-cedar (POC) root disease infestation. Sanger Lake is located on the Smith River National Recreation Area, along FS Road 4803 (T17N, R5E, Sec 5, coordinates N 41° 54.111', W 123° 38.956'). Outflow from the lake passes under the road through a culvert, and continues approximately one mile to the Middle Fork of the Smith River. North from Sanger Lake, Road 4803 continues approximately one mile to a pass near Sanger Peak at the border between the Six Rivers and Rogue River-Siskiyou National Forests, then drops down into Oregon along Chicago Creek in the East Fork Illinois River Analytical (fifth field) Watershed. While scattered groups of infected POC are known to be present along the watercourse below the road at Sanger Lake, the nearest roadside POC root disease infestation from Sanger Lake is at milepost 9 of FS Road 18N07, approximately four road miles away. The headwaters of Chicago Creek and the East Fork of the Illinois River are uninfested, though there are numerous infestations along the Illinois River, at least ten air miles further below in Oregon.

On arrival at the Sanger Lake along FS Road 4803, we saw two groups of dead and dying POC, one above the road near the culvert at the parking area and the other below the road at the outlet of the culvert. There were approximately 9 dead POC above the road and about 15 below (Figures 1 and 2). Presence of dead foliage indicated that the mortality was fairly recent, most likely within the last 2-4 years. When the bark was peeled away from the base of the most recently killed trees, we found a distinctive cinnamon-brown-colored stain with a sharp margin coming from the roots (Figure 3). This is highly indicative of Port-Orford-cedar root disease. Bark samples were sent to Oregon State University for genetic PCR diagnostic analysis, but came up negative for the presence of *Phytophthora lateralis*. However, both Frank and I are confident that the pathogen was indeed the cause of the mortality, and that it would be prudent to immediately take management actions to limit further spread of the disease around Sanger Lake and over to the Illinois River Watershed. At the very least, the presence of the pathogen along the road at the parking area at Sanger Lake increases the risk that inoculum will be spread around by human foot traffic to the POC stands around the lake and carried by vehicles one mile further,





Figure 1- Dead and dying POC above Road 4803 at Sanger Lake

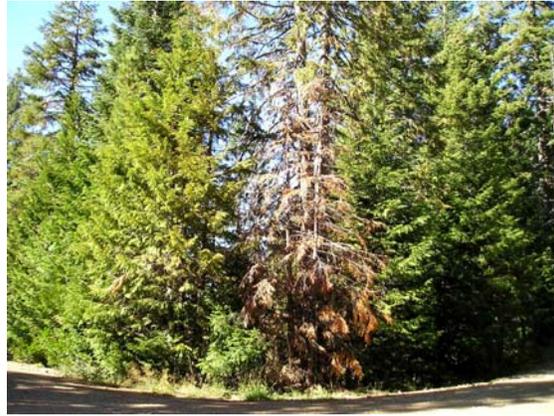


Figure 2- Dead and dying POC below Road 4803 at Sanger Lake



Figure 3- Stained phloem and xylem tissue from dying POC below Road 4803 at Sanger Lake

over the pass to the headwaters of the Illinois River Watershed. Suggested management actions to address the situation are as follows:

1. Eradicate *P. lateralis* from the roadside POC root disease infestation at Sanger Lake. At the present time, the visible infestation is limited to approximately 24 dead and dying POC on either side of Road 4803 above and below the outflow of Sanger Lake. Additional POC are likely also infected but not yet showing symptoms. Killing all POC within 3 crown heights of the visibly infected POC immediately above and below the road would stop the production of new *P. lateralis* inoculum and allow the pathogen to gradually die out from this roadside location, reducing the potential for further human-caused spread. In order for this treatment to work, POC of all sizes (seedlings to large trees) would have to be killed, and the area would have to be frequently monitored to remove any new POC seedlings that may become established and to make sure that the disease does not show itself outside the eradication area. POC that cannot be pulled out of the ground may be either cut or girdled, though it would be preferable to cut the trees in order to ensure rapid mortality. Because to the area's proximity to the road, any POC that are tall enough and large enough to cause damage to humans, vehicles or property if it fails should be cut rather than girdled. To reduce the post-treatment fuels along the road, slash should

be burned or removed following the cutting of the POC. If the treatment is successful, it will take approximately 5-7 years for the pathogen to die out from along the road. Monitoring for the presence of the pathogen by deploying POC seedling bait trees on a yearly basis may help track the effectiveness of the treatment.

2. Improve drainage and reduce wet spots at Sanger Lake. To reduce spread of the pathogen by humans around Sanger Lake, areas adjacent to POC along the lakeside trail and around the lake should be closely inspected for perennially wet and muddy spots. Once identified, these spots may be fixed by improving drainage, armoring trails and walkways or by filling in wet spots with rock or other suitable materials. By separating people from mud and water near POC, opportunities to pick up and deposit the pathogen can be greatly diminished. Signs may also be put up, telling visitors about the problem and discouraging them from walking through wet, muddy areas.

3. Inspect and correct road surface and drainage problems near POC. POC along Road 18N07 are currently protected with wet-season road closure gates at Milepost 9 and 13, and Road 4803 is similarly protected by a series of gates on the Illinois Valley side, the uppermost of which is located approximately one mile below the pass near Sanger Peak, about two miles from Sanger Lake. During our visit, we did not note any major problems with poor drainage or perennially muddy road surfaces along Roads 18N07 or 4803. However, these roads should be further inspected by road and maintenance personnel and any problem areas within 25-50 feet of POC should be prioritized and corrected. The highest priority area for correction would be within 2 miles of Sanger Lake (below the Lake and up to and over the pass), followed the two miles of Road 18N07 above the infestation at Mile Post 9. Additional treatment outside of these areas along Roads 18N07 above Mile Post 9 and along Road 4803 further down into the Rogue River-Siskiyou NF would also be desirable, and would help lower the risk of initiating new areas of POC root disease spread.

4. Implement roadside sanitation of POC. Roadside sanitation of POC (by cutting or pulling out all POC within 25 feet of the road or within 50 feet the road at stream or drainage crossings) can greatly reduce the risk of introduction of POC root disease by reducing or eliminating the possibility for vehicle-borne inoculum to be deposited near potential host trees. These trees may be removed or left on site. To prevent the creation of roadside hazards, any POC large enough and close enough to the road to cause damage if it falls should be cut rather than girdled. Again, the highest priority area for treatment would be within 2 miles of Sanger Lake (below the lake and up to and over the pass), followed by the two miles of Road 18N07 above the infestation at Mile Post 9. As with Recommendation #3 above, treatment along Roads 18N07 and 4803 outside of these two areas would also be desirable.

### Summary and Conclusions

The new POC root disease infestation along the road at the parking area at Sanger Lake needs to be addressed as soon as possible. All of the management actions listed above would reduce the potential for spread of the disease from the infestation at Sanger Lake, and in particular, over the nearby pass and into the headwaters of the East Fork Illinois River Watershed. The highest priority, most critical and time-sensitive action is Treatment #1, the eradication of *P. lateralis*

from the current Sanger Lake infestation area. Because inoculum levels will continue to increase until the eradication effort is implemented, the sooner this is done, the easier it will be to implement and the greater the likelihood for success. Although recommendations #1 and 2 may be implemented solely by the Six Rivers National Forest, recommendations #3 and 4 (roadside maintenance and POC sanitation) would best involve a coordinated effort by both the Six Rivers and Rogue River-Siskiyou National Forests. Frank Betlejewski and I are available to help the National Forest personnel, particularly those from the Smith River NRA and Wild Rivers Ranger District, in further developing appropriate and effective treatments. The Six Rivers National Forest already has funds from the FY2009 POC Base Maintenance Program that can contribute to this overall effort. If this is not sufficient, we can explore other options.

If you have any questions or concerns regarding the recommendations in this report, feel free to contact Frank Betlejewski or me.

PETE ANGWIN  
Plant Pathologist  
Forest Health Protection  
Northern California Shared Service Area

CC: MARY KAY VANDIVER, KEN NEELEY, DON PASS, MIKE MCCAIN, ROY BERGSTROM, JOEL KING, ROB BARNHART, ELIZABETH BERGER, JULIE LYDICK, PHIL CANNON, CYNTHIA SNYDER AND JOEL EGAN