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Route To:

Subject: Methodist Camp Port-Orford-cedar Root Disease (FHP Report No. N02-01)

To: Forest Supervisor, Shasta-Trinity National Forest

On September 26, 2001, Pete Angwin and Dave Schultz, from the Northern Forest Health Protection Shared Service Area discovered a new Port-Orford-cedar (POC) root disease infestation site on the Scott Camp Creek, approximately 300 yards downstream from the bridge into the Methodist Camp. Because this is the first root disease site identified in the Upper Sacramento River drainage, this discovery was highly significant. To assist with the formulation of management recommendations, on October 20 we returned to the area to perform additional reconnaissance.

Starting at the bridge, we walked along the creek to the infestation site, which is in a slack water portion that was created by a logjam of woody debris. Water above and below this area appears to follow many channels in a braided fashion during the wet period of the year. Five POC in various stages of decline (from off-green and flagging to bright orange) are present at the site where we initially diagnosed the disease. Additional root examination reconfirmed the presence of the disease, as indicated by the cinnamon-brown stain in the inner bark and cambium, coming up from the roots below. Several branches had been cut off of these trees, so it's possible that the disease was introduced by bough cutters. Two additional diseased trees were found in the area. Both are off-green in color and exhibited stain characteristics typical of the disease. One is about 1" DBH, and is located about 30 feet upstream from the group of five infected trees. The other is about 16" DBH, and is about 75 feet downstream from the group. Red candystripe ribbon was placed around the bole of each of the seven diseased trees.

Next, we walked about 1/3 to 1/2-mile down the creek. About 300 feet below the group of five infected trees, the "braids" of the creek merge into a single channel and the water picks up speed in its downhill run. All POC looked green and healthy. By the time we stopped, we were satisfied that no more diseased trees were present. Because of the relative lack of additional fading Port-Orford-cedars in the vicinity of the infestation area, it appears that *Phytophthora lateralis*, the fungus that causes the root disease, was only recently introduced to the area.

### Management Alternatives

At this point, two management alternatives are possible for this area:

1. Do Nothing – If nothing is done, the disease will continue to spread to the Port-Orford-cedar downstream, eventually reaching and infecting POC down to Lake Siskiyou, about 3 miles below. Presence of a large infestation above Lake Siskiyou will increase the chance that spore-infested mud will be picked up and carried by humans to other areas of the upper Sacramento River, or to the currently uninfested Trinity River drainage.
2. Remove Infected POC and Uninfected POC In A Buffer Zone Around The Infestation – At



the present time, it appears that the disease is present in only a limited area at Scott Camp Creek. If prompt action is taken, eradication of *P. lateralis* from the area may be feasible.

Under this alternative, the seven infected POC and all live POC in a buffer zone around the infestation will be cut down or pulled up from the ground. Preliminary results from a recent field trial in southwest Oregon indicate that following complete sanitation removal of POC, *P. lateralis* inoculum levels take about 4-5 years to start to drop, and take about 7 years to drop to negligible levels (Marshall and Goheen 2000). By removing infected and surrounding POC, disease spread will be limited and the clock will start to run toward eradication of the fungus from the area.

In order to be effective, all POC with roots that reach the winter high water mark of the creek, from the smallest seedling to the largest tree, will have to be removed from the treatment area. It is difficult to say how far downstream from the infestation that POC would have to be removed. The further the better. POC upstream would only have to be removed if their roots are near the roots of infected POC or if water may back up to the uninfected tree roots.

Removal of only infected POC will not be effective, since additional nearby POC will likely become infected before the current inoculum level declines. In addition, nearby POC are probably already infected, but are not yet showing symptoms.

### Recommendations

Because of the severe potential impacts of the continued spread of POC root disease at Scott Camp Creek, the potential for spread elsewhere, and likelihood that at we've identified the infestation at an early stage, I recommend implementing Alternative #2. At this point, the main problem is deciding how far downstream the POC should be removed. In an attempt to answer that question, Dave and I flagged with orange flagging all POC (large and small) in an area that we thought would likely contain the disease until the inoculum dies out. As we flagged the trees in this removal zone, we recorded the approximate DBH of each POC. All POC with roots that might reach the highest likely water mark of the creek were flagged. The toughest part was deciding how far downstream to end the removals. Because POC root disease tends to get established in areas of slack water, we stopped flagging at a point about 300 feet below the infestation, where the braids of the creek come together and water runs quickly through a single narrow channel for about another 400 feet. When we were done, we had flagged off an area approximately 300-400 feet long and 100 feet wide. This area is about one acre in size. Extension of the removal zone further downstream to obtain additional protection may be considered. Notching large logs in the logjams below so that water is only temporarily backed up may also be considered.

The estimated DBH counts of the trees in the proposed removal area are as follows:

DBH	Green	Fading	Infected
<1	283		
1	29		1
2	21		
3	14	1	
4	11		
5	7	1	1
6	7		
7	5		
8	5		1
9	4		
10	4		
11	3		
12	2		
13	2		1
14	8		
15	1		
16	10		2
17	1		
18	2		
19			
20	5		
21			
22	5		
23			
24	2	1	
25			
26	2	1	
27			
28	7	1	
29			
30	11		
34			1
36	4		
40	1		
42	1		
44	1		

Because eradication of POC root disease from this area will require the removal of many large, currently healthy POC, the effort may be controversial. However, without this attempt, POC of

all sizes in the removal zone, and many more downstream, will die anyway. Because the fungus can reestablish itself in POC of any size, all POC in the treatment zone will have to be removed for the treatment to be effective. This is not an easy task. Seedlings and smaller trees may be pulled from the ground or cut below the lowest lateral bud. In addition, because POC seeds back in very easily, the site will have to be revisited at least every 2 years to remove all new seedlings.

Successful eradication of the disease from this site will not be easy. It will require a serious commitment of both time and effort, and should not be attempted unless the Forest Service land managers agree to fully follow through on this effort. It is also possible that in spite of our best efforts, the fungus may spread further downstream anyway. However, if this does happen, at least we'll be able to say that we did everything that was reasonably possible to prevent this from happening. Again, without these efforts, the disease is sure to spread.

The appearance of POC root disease at Scott Camp Creek has presented us with a number of challenges. If you have any questions or comments regarding the recommendations in this report, please feel free to give me a call. As Always, Dave and I are available to assist in any way that we can.

/s/ Peter A. Angwin  
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cc: Bob Hammond  
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Jim Harvey  
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#### **LITERATURE CITED**

Marshall, K. and D.J. Goheen. 2000. Preliminary results of effectiveness monitoring of Port-Orford-cedar roadside sanitation treatments in southwest Oregon. IN: Hansen, E.M. and W. Sutton, editors., *Phytophthora Diseases Of Forest Trees, First International Meeting On Phytophthoras In Forest And Wildland Ecosystems*. Int. Union For. Res. Org. August 30-September 3, 1999. p. 125-126.