



A guide for recreational users: Simple precautions to prevent the spread of Sudden Oak Death

A new plant disease known as Sudden Oak Death is threatening coastal forests in California and Oregon. Currently found in 14 coastal counties from Monterey to Humboldt in California, and Curry County in Oregon, the disease is caused by the pathogen *Phytophthora ramorum* (pronounced Fi-TOFF-thor-ra ra-MOR-um). To date, tens of thousands of tanoak and oak have been killed by this disease. In addition, more than 25 other native tree and shrub species are susceptible to the organism, yet most of these species suffer only minor damage, limited to leaf spots or twig dieback.

Phytophthora ramorum may be transported to new areas when infected plants or infested soil is moved, even inadvertently. Many common California forest plants may be carriers, such as California bay laurel (also called pepperwood or Oregon myrtle), bigleaf maple, and madrone. This guide provides simple, practical information on how to travel in and through coastal forests without moving the deadly organism to new areas. These suggested practices may be useful to people that live, work, or recreate in areas that are infested by this potentially devastating disease.

To spend time in the forest without accidentally spreading this organism, it is important to understand its preferred environment. *Phytophthora ramorum* likes wet or moist climates, cool temperatures, and living plants. Its spores can be found in soil and water as well as plant material. The risk of movement and spread of the organism is greatest in muddy areas and during rainy weather.



The following California counties have confirmed *Phytophthora ramorum* findings and are under State and federal quarantine regulations: Alameda, Contra Costa, Humboldt, Lake, Marin, Mendocino, Monterey, Napa, San Francisco, San Mateo, Santa Clara, Santa Cruz, Solano, and Sonoma. The organism has also been found in Curry County, southwestern Oregon.

These quarantined areas are subject to special rules (regulations) regarding the movement and use of susceptible plants. County Agricultural Commissioners enforce both California and federal regulations. For more information on State and federal quarantines, go to www.suddenoakdeath.org or contact your County Agricultural Commissioner.



Symptoms

The symptoms of Sudden Oak Death can be dramatic (Photo 1), killing several large and small tanoaks, or fairly subtle (Photo 2), where a few California bay laurel leaves only show signs of the disease through leaf spots. Symptoms on the various plant species range greatly, from leaf spots to the death of mature trees. (Plants known to be susceptible to *Phytophthora ramorum* are listed in the table at the end of this document.)

If you see several symptomatic host plants (Photos 3 & 4) next to bleeding oaks and tanoaks (Photos 5 & 6) you may be in an infested area. California bay laurel is a good indicator plant to check for symptoms. Although damage is limited to leaf spots, these trees are often the first plants to show symptoms in a newly infested area. Note that on California bay laurel, leaf spots are typically near the leaf tip, they are not on every leaf, and they may be hard to see from far away. While inspecting for leaf spots, focus on lower branches as this is where the disease is commonly found and leaves are more accessible. When working in the forest, a good rule is to avoid collecting plants or firewood from areas where you see any symptomatic plants. By avoiding these areas, you will avoid spreading any disease-causing organisms that may be present.



Photo 1. Forest in Marin County with tanoak trees killed by *Phytophthora ramorum*. (Photo by B. Tkacz, USDA Forest Service.)



Photo 2. California bay laurel (also called pepperwood, or Oregon Myrtle) showing leaf spots typical of *Phytophthora ramorum*. (Photo by Bruce Moltzan, Missouri Department of Conservation.)



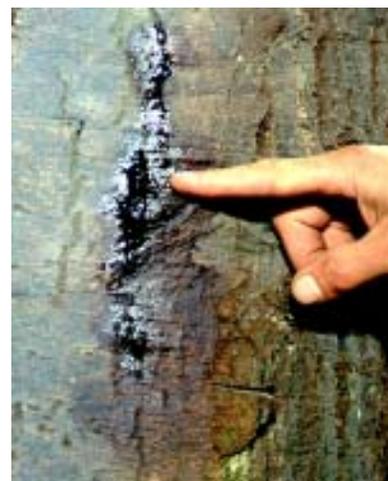
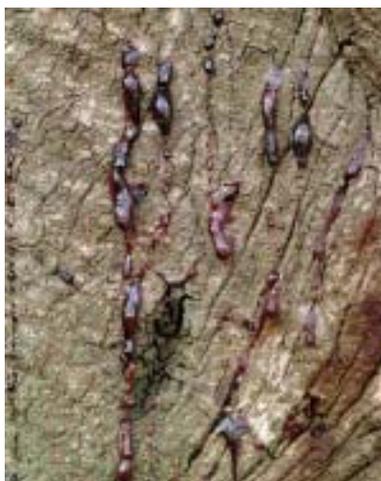
Photo 3 (left). Bay laurel leaf spots. (Photo by Matteo Garbelotto, University of California, Berkeley.)



Photo 4 (right). Rhododendron leaf spots. (Photo by B. Moltzan, Missouri Department of Conservation.)

Photo 5 (left). Bleeding cankers on a coast live oak trunk. (Photo by Matteo Garbelotto, University of California, Berkeley.)

Photo 6 (right). Bleeding cankers on a tanoak trunk. (Photo by Pavel Svihra, UC Cooperative Extension.)



Recommendations

Where to go:

- If possible, avoid areas that are, or appear to be, diseased. If you cannot avoid infested areas, follow the sanitation practices listed below when recreating in known infested areas. If you do not know whether or not the site is infested, play it safe and assume that it is.

When to go:

- During wet periods, the organism seems to be most active and therefore most likely to start new infections. If possible, do not work or recreate in infested forests during the wet, rainy, and cool times of the year. Avoid working in muddy conditions whenever possible.

How to prevent spread:

- Familiarize yourself with the symptoms of Sudden Oak Death on common forest plants and stay clear of those areas.
- Stay on established trails and respect trail closures. Park your vehicle in designated parking areas and out of the mud.
- Plant collectors who plan to transport host plant material out of an infested county must first contact the local Agricultural Commissioner for a permit. Otherwise, do not collect and transport wood, plants, acorns, leaves, soil or water from streams, lakes or rivers
- Carry cleaning materials in your car to use at the end of your visit. An old screwdriver, stiff brush, and towel are useful items for removing mud and other debris. An additional level of sanitation can be achieved by washing with soap and water or spraying with a disinfectant, such as Lysol or a 10% bleach solution.

Hikers/Runners: Remove soil and plant material from your shoes, followed by a water rinse and a disinfectant. If you are frequently in and out of contaminated sites consider committing footwear for use in that environment only.

Dog walkers: Keep your dog clean by staying on established trails and away from contaminated forest areas. Clean any plant material and mud from your dog's coat and paws with a towel and brush, or rinse off before leaving the site.

Bicyclists: Remove soil and plant material from your bike, shoes, and clothes. Rinse your bike and shoes with water and follow with a disinfectant.

Equestrians: Keep yourself and your horse clean by staying on established trails and out of contaminated forest areas. Clean any plant material and mud from the horse and its hooves with towels and brushes before leaving the site.

Plant collectors (mushrooms, firewood, etc.): Remove soil and plant material from your shoes and tools, followed by a water rinse and a disinfectant. If you are frequently in and out of contaminated sites consider committing footwear and tools for use in that environment only. If you intend to move host plants out of an infested county, you must first contact the local Agricultural Commissioner for a permit.

Off-road vehicles (motorcycles, OHV's, and FWD's): If you drive off-road during the wet season, mud can collect on your vehicle and drop off in uncontaminated areas. Take your vehicle to the closest car wash before driving out of the area to ensure removing this contaminated material.

Campers: Camping equipment that may have collected plant debris and mud, such as tents, should be cleaned out before leaving the campground. Once contaminants have been removed, you may also want to sanitize with a disinfectant.

**Plants known to be susceptible to *Phytophthora ramorum*,
cause of Sudden Oak Death and other diseases (September 2004)**

Common Name	Scientific Name
Andrew's clintonia bead lily	<i>Clintonia andrewsiana</i>
Bigleaf maple	<i>Acer macrophyllum</i>
California bay laurel/pepperwood/Oregon myrtle	<i>Umbellularia californica</i>
California black oak	<i>Quercus kelloggii</i>
California buckeye	<i>Aesculus californica</i>
California coffeeberry	<i>Rhamnus californica</i>
California hazelnut	<i>Corylus cornuta</i>
California honeysuckle	<i>Lonicera hispidula</i>
California wood fern	<i>Dryopteris arguta</i>
Camellia varieties	<i>Camellia</i> species
Canyon live oak	<i>Quercus chrysolepis</i>
Cascara	<i>Rhamnus purshiana</i>
Coast live oak	<i>Quercus agrifolia</i>
Coast redwood	<i>Sequoia sempervirens</i>
Douglas-fir	<i>Pseudotsuga menziesii</i>
Drooping leucothoe	<i>Leucothoe fontanesiana</i>
European beech	<i>Fagus sylvatica</i>
European turkey oak	<i>Quercus cerris</i>
European yew	<i>Taxus baccata</i>
Evergreen huckleberry	<i>Vaccinium ovatum</i>
False Solomon's seal	<i>Smilacina racemosa</i>
Formosa firethorn	<i>Pyracantha koidzumii</i>
Grand fir	<i>Abies grandis</i>
Heather	<i>Calluna vulgaris</i>
Holm oak	<i>Quercus ilex</i>
Horse-chestnut	<i>Aesculus hippocastanum</i>
Laurustinus	<i>Viburnum tinus</i>
Lilac	<i>Syringa</i> species
Madrone	<i>Arbutus menziesii</i>
Manzanita	<i>Arctostaphylos manzanita</i>
Mountain laurel	<i>Kalmia latifolia</i>
Northern red oak	<i>Quercus rubra</i>
Pieris/Andromeda varieties	<i>Pieris</i> species
Poison oak	<i>Toxicodendron diversiloba</i>
Rhododendron/azalea varieties	<i>Rhododendron</i> species
Salmonberry	<i>Rubus spectabilis</i>
Shreve oak	<i>Quercus parvula</i> v. <i>shrevei</i>
Southern red oak	<i>Quercus falcata</i>
Strawberry tree	<i>Arbutus unedo</i>
Sweet bay laurel	<i>Laurus nobilis</i>
Sweet chestnut	<i>Castanea sativa</i>
Tanoak	<i>Lithocarpus densiflorus</i>
Toyon	<i>Heteromeles arbutifolia</i>
Viburnum/Arrowwood varieties	<i>Viburnum</i> species
Victorian box	<i>Pittosporum undulatum</i>
Western starflower	<i>Trientalis latifolia</i>
Winter's bark	<i>Drimys winteri</i>
Witch-hazel	<i>Hamamelis virginiana</i>
Wood rose	<i>Rosa gymnocarpa</i>

This list will change as more information becomes available. For the most current information or more details on affected varieties of horticultural plants, please check www.suddenoakdeath.org.