

Forest Insect and Disease Highlights in Oregon and Washington, 1998



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Introduction

In the West, forests have been shaped by disturbances: geological events (such as the eruption of Mount St. Helens), climate, fire, insects, diseases, and animal and human activity. The health of our forests is affected by the frequency and severity of disturbance and whether the changes from disturbances are acceptable or desirable to people.

Forest Health

"A healthy forest can renew itself vigorously across the landscape, recover from a wide range of disturbances, and retain its ecological resilience while meeting current and future needs of people for values, uses, products, and services."

Adapted from: Forest Health Policy, USDA Forest Service, 1997

In Washington and Oregon, disturbances such as insect and disease activity have been monitored for many years. More recently, data has been gathered on a number of other attributes of forest health by inventory and monitoring programs such as Forest Inventory and Analysis, Forest Health Monitoring, and Current Vegetation Survey. This report focuses mainly on insect and disease impacts, one part of the larger picture of forest health.

The primary insect and disease monitoring activity in Oregon and Washington is the annual insect and disease aerial survey. This survey is conducted cooperatively by Oregon's Department of Forestry, Washington's Department of Natural Resources, and USDA Forest Service's Pacific Northwest Region. The aerial survey examines all forestlands of Washington and Oregon between the first part of July and early to mid-September. During aerial survey, two observers ride on opposite sides of a small plane, which travels at approximately 100 mph at least 500 feet above the trees. The plane flies in a 4-mile grid pattern.

Each observer looks at the trees below and two miles out from the plane on his or her side. They record the number of trees affected and the likely cause of damage or mortality.

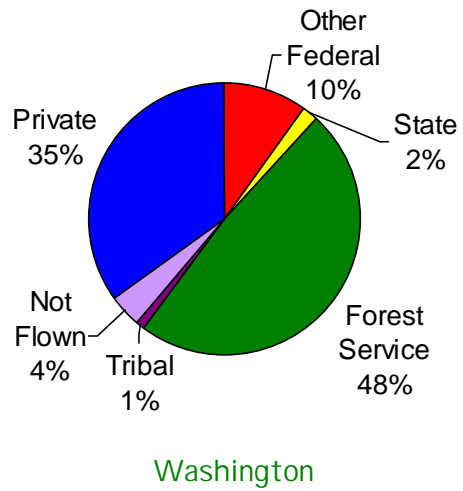
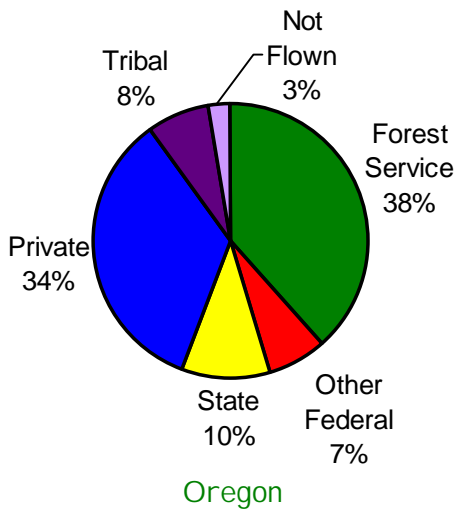


View of defoliated forests from an aerial survey plane. Photo source unknown.

In 1998, approximately 28,000,000 acres were surveyed in Oregon (96% of all forested lands in Oregon) and 20,500,000 acres were surveyed in Washington (97% of all forested lands in Washington). Aerial survey information is transferred to electronic GIS layers and distributed to major forest landowners, land managers, and extension agents throughout the state. Annual damage maps for Washington and Oregon are available as GIS layers (<http://www.fs.fed.us/r6/nr/fid/data.htm>). More information about aerial survey can be found at the following website: <http://www.fs.fed.us/foresthealth/id/detect.html>

Special aerial surveys are also conducted (either cooperatively or by the individual agencies) to collect data on damage that may need to be surveyed more intensively or may not be visible during the regular survey. In 1998, special surveys were flown by the states during the spring for Swiss Needle Cast along the northwest coast of Oregon and the southwest coast of Washington. Oregon Department of Forestry also conducted a special mortality and bear damage survey in western Oregon in June of 1998.

Forested Acres Surveyed by Air in 1998

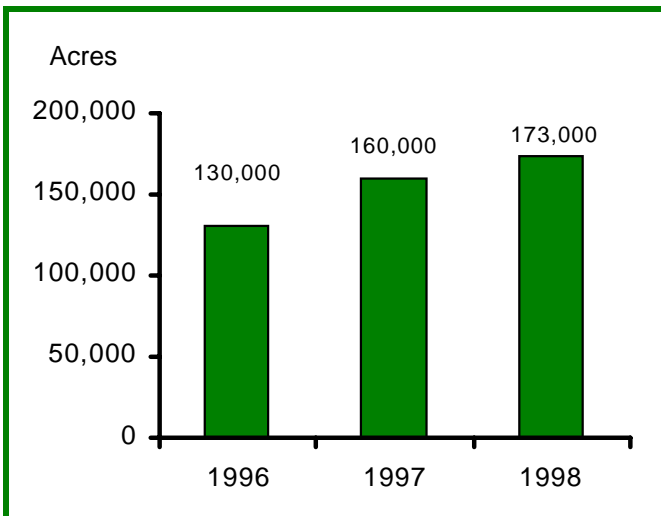


Oregon Highlights

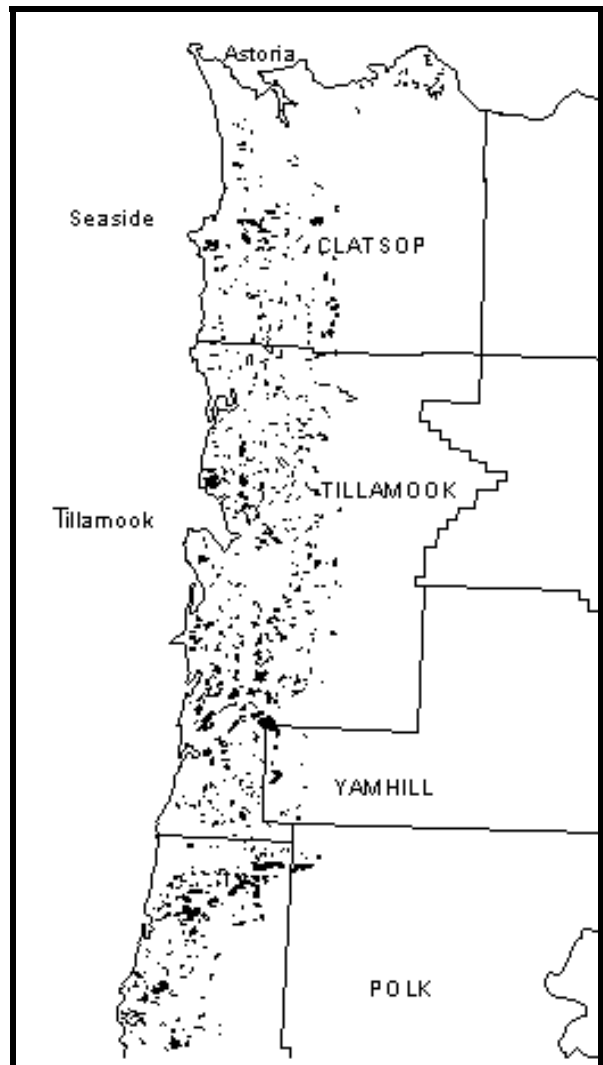
Diseases

Swiss Needle Cast

The Swiss needle cast epidemic in coastal Douglas-fir forests continued during 1998. Although not considered a tree killer, the disease causes considerable growth loss and can affect the structure and composition of stands. Three consecutive years of aerial surveys show a steady increase in the number of acres with obvious damage. Although the disease occurs on Douglas-fir throughout its range, the most severe damage occurs in stands within about 20 miles of the coast.



Acres of Douglas-fir forest with Swiss needle cast symptoms detected during aerial surveys.



Distribution of Swiss needle cast in Oregon, 1998



Left: Branch from a Douglas-fir affected by Swiss needle cast. Photo by Alan Kanaskie, Oregon Department of Forestry.

Below: Branch from a healthy Douglas-fir. Photo by Alan Kanaskie, Oregon Department of Forestry.



Oregon Department of Forestry staff is active in the OSU Swiss Needle Cast Cooperative, which is coordinating numerous research projects on Swiss needle cast. Thus far, growing species other than Douglas-fir in the high-risk areas is the most promising long-term solution. Meanwhile, geneticists are screening selected Douglas-fir for possible tolerance to the disease, which, along with a risk rating system, also may be part of a long-term solution. Chemicals and nutritional amendments are not promising treatments at this time. Thinning and other silvicultural tactics also are being evaluated on state and private forests.

Other Tree Diseases

Although Swiss needle cast catches much of the limelight, other diseases continue to affect Oregon's forests. **Laminated root rot** is the most

widespread and destructive root disease in the State. Others such as **black stain root disease** and **Armillaria root disease** have significant effects in certain areas, particularly southern and eastern Oregon. With the exception of Port-Orford-cedar root disease (or other diseases caused by exotic pathogens), the effects of root diseases on forests may be positive or negative, depending on management objectives.

The unusually wet springs and warm winters of 1997 and 1998 have contributed to an increase in damage from several **foliage diseases** throughout the state. These are highly visible diseases, which usually cause only temporary setbacks to tree growth.

Insects

Sitka Spruce Aphid

Damage to spruce caused by the Sitka spruce aphid is easy to confuse with foliage diseases. Spruce aphid is the most visible defoliator in western Oregon and has defoliated more than 6,000 acres of Sitka spruce from Astoria to Gold Beach. Large open-grown spruce suffer the most defoliation, which is concentrated in the mid or lower crown. In some coastal areas spruce may be killed if the aphid outbreak persists.



Spruce aphids. Photo by Andris Eglitis, USDA Forest Service.



Effects of spruce aphids on foliage. Photo by Andris Eglitis, USDA Forest Service.

Douglas-fir Tussock Moth

The Douglas-fir tussock moth early warning trap survey has detected significant increases in populations of this important defoliator of eastern Oregon forests. If populations continue to increase in 1999, the Department will employ larval and cocoon sampling in areas where trap catches indicate the potential for an outbreak.



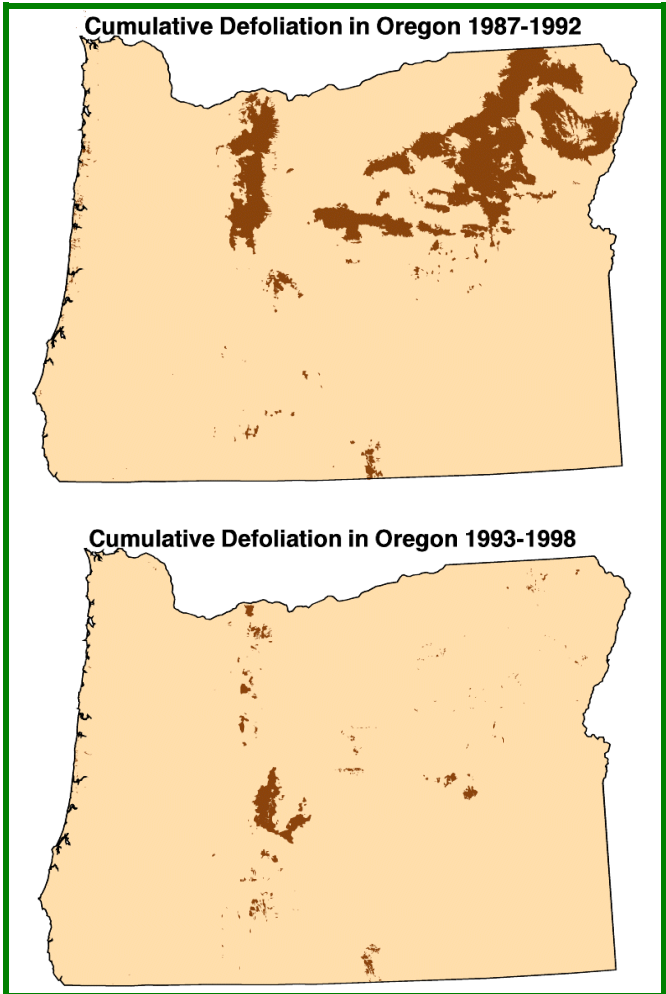
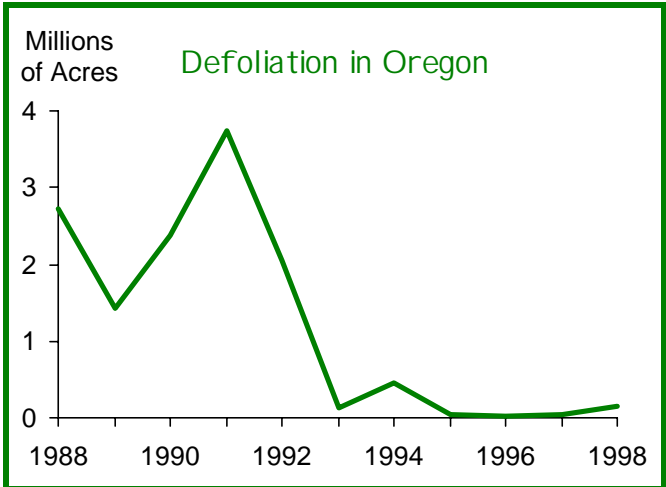
Douglas-fir tussock moth larva. Photo by Pacific Northwest Region, USDA Forest Service.

Other Defoliating Insects

After several years of obscurity, other populations of defoliating insects appear to be on the rise in Oregon. In Lake County, the Modoc budworm has defoliated over 28,000 acres of white fir near Lakeview. Outside of Chemult in Central Oregon, a needle miner outbreak has defoliated lodgepole pine over thousands of acres.

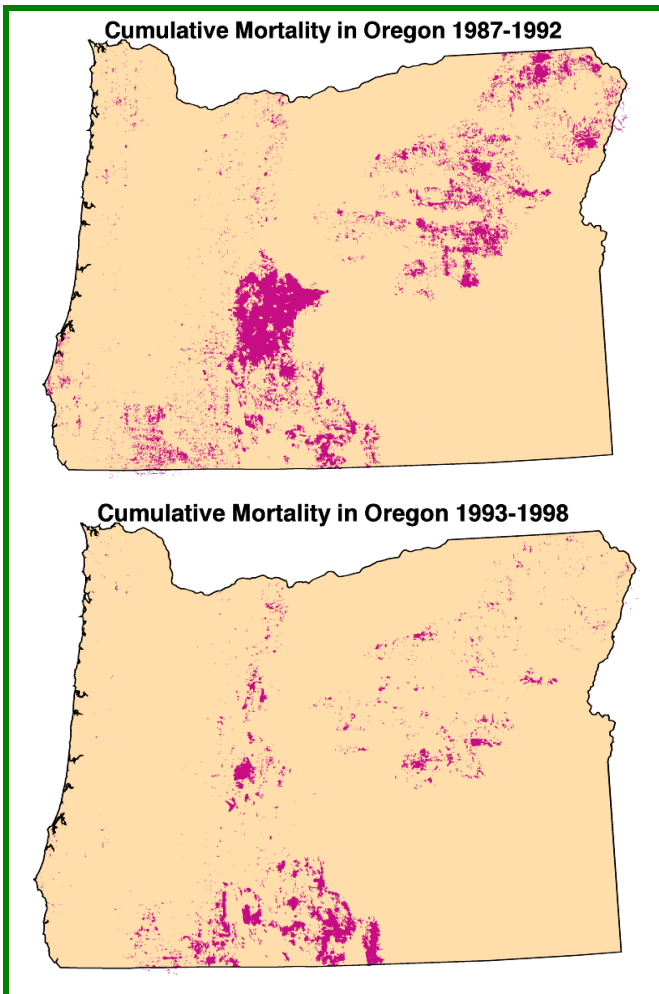
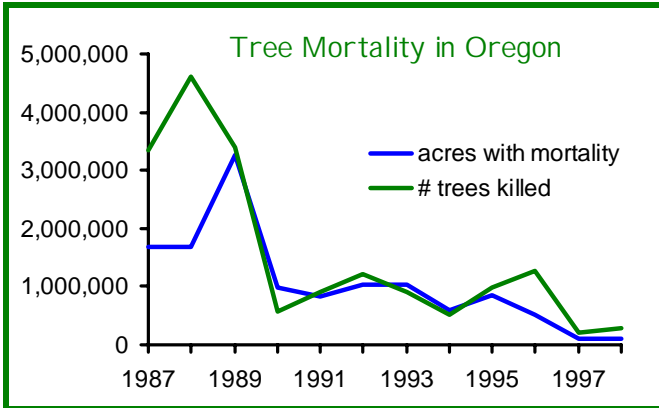
Defoliation Trends

Western spruce budworm activity in eastern Oregon was relatively high in the late 1980's and early 1990's, accounting for much of the visible defoliation during that time. Since 1993, defoliation has remained at low levels throughout Oregon.



Mortality Trends

Overall, trends show decreases in mortality in Oregon over the past 15 years, due mainly to decreases in bark beetle-caused mortality. Drought periods in the late 1980s and early 1990s, coupled with overstocked stands, contributed to increased mortality from insects and diseases. Alleviation of drought in the last decade has slowed rates of mortality, especially in pines east of the Cascades.



Washington Highlights

Diseases

Swiss Needle Cast

Swiss needle cast (SNC) is a foliage disease that damages Douglas-fir, causing premature needle shed. A constant concern of Christmas tree growers, this native disease has recently increased sufficiently to cause concern to foresters.

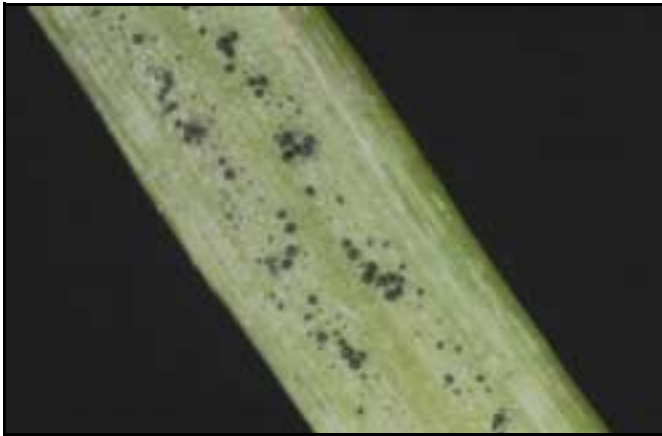
The Washington Department of Natural Resources has initiated a SNC monitoring program that will help focus disease management activities and research efforts. In April of 1998, about 1.7 million acres of forest in southwestern Washington was surveyed by air for SNC. Symptoms were detected on 44,500 acres. Well over 90% of these stands had light damage. The remainder had heavy damage symptoms.



Douglas-fir affected by Swiss needle cast. Photo by Oregon Department of Forestry.

Ground surveys conducted simultaneously revealed that nearly every young Douglas-fir stand in western Washington is affected by SNC to some extent. Those retaining three or more years of needles are not being visibly damaged.

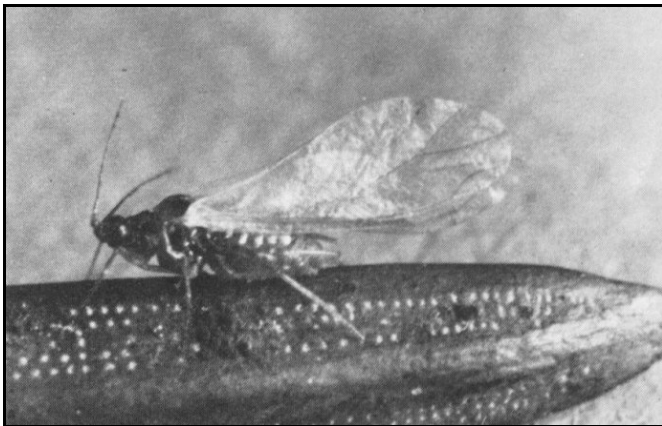
Investigations are currently underway to determine the growth impacts of SNC on Douglas-fir plantations. Management strategies that include planting of appropriate tree species and enhancing tree vigor are recommended.



Close-up view of a Douglas-fir needle with Swiss needle cast. Photo by Washington Dept. of Natural Resources.

Spruce Aphid

The mild winter of 1997-98 contributed to the explosion of several defoliating insects. Spruce aphid damaged the older needles of Sitka spruce, causing trees to have a scorched, skeletal appearance. Ornamental species of spruce were also affected. Unless the trees were in very poor health prior to the outbreak or completely defoliated, mortality is not expected.



Adult spruce aphid on a spruce needle. Photo from WSU Coop. Extension EB 1053, March 1982.

Western Spruce Budworm

Western spruce budworm defoliation in southcentral Washington greatly expanded and intensified, affecting approximately 500,000 acres east of Mt Adams. Budworms consume the buds of Douglas-fir and grand fir. "It's simply humbling to consider the number of moths and eggs and caterpillars which had to be present to consume this many buds on this many trees over such an area," said Karen Ripley, Department of Natural Resources' Forest Entomologist.

Major landowners are currently working to share information and coordinate approaches for responding to this infestation. Management options include rapid salvage of damaged trees, intensification of forestry activities that shift stand composition toward non-host species, and aerial application of insecticides.



Defoliation caused by western spruce budworm. Photo source unknown.

Douglas-fir Tussock Moth

Another important defoliating insect in Washington is the Douglas-fir tussock moth (DFTM). DFTM is nearly absent from the forest for many years, then rapidly erupts for a 3-4 year period, consuming foliage of Douglas-fir and grand fir on hundreds or thousands of acres, then subsiding again.



Douglas-fir tussock moth larva. Photo by Pacific Northwest Region, USDA Forest Service.

Insect traps are used to monitor DFTM each year throughout eastern Washington in hopes of obtaining early warning of an imminent outbreak. Trap catches in 1996 - 1998 have showed an increasing trend. Defoliation was observed in 1998 on ornamental Colorado blue spruce trees in Meade and Winthrop. Damage to ornamental blue spruce is a good indicator of future defoliation of nearby forests by tussock moth. No forest defoliation has been observed in 1998. It is expected to occur in 1999 or 2000.

Asian Long-horned Beetle

Exotic pests are of extreme interest and concern to the forestry community. In July an Asian long-horned beetle was recovered from a pallet in the Port of Bellingham. These beetles travel here from China in infested low-grade wooden packing material. They are easily capable of becoming established in Washington and killing many hardwood tree species.



Asian long-horned beetle. Photo source unknown.

Infestations have been detected in street trees in Chicago and New York. Thus far, detections in Washington have been confined to wooden packing material. New rules that regulate the wood pallets and packing materials that accompany goods imported from China will be implemented in December 1998.

Gypsy Moth

Gypsy moths are voracious defoliators of a wide variety of broadleaf trees and shrubs. They have been a pest in the northeastern U.S. for over 100 years and are usually brought to Washington accidentally on vehicles and household articles being moved from infested parts of North America.



Gypsy moth survey trap. Photo by Washington Department of Natural Resources.

Fifty-three European gypsy moths were caught in Washington in 1998. Ground-based insecticide treatments may occur near Bellevue and Tacoma in 1999. Parts of Vancouver Island are currently under quarantine because of a gypsy moth outbreak that is expected to be treated with aerial insecticides in the spring of 1999.

The Asian gypsy moth is potentially more capable of spreading and damaging conifer forests. It originates in the Russian Far East and travels here on ships. None were caught in the western United States in 1998, but populations in forests surrounding Siberian ports areas are rising.

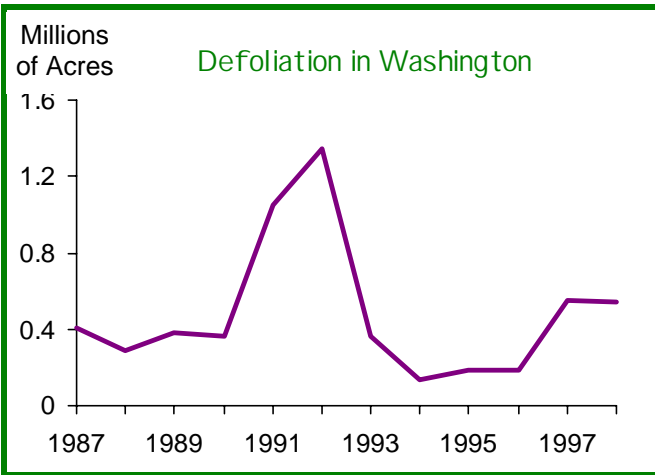
Weather

Weather affects both tree vigor and the ability of trees to cope with insects and diseases. Trees were stressed during the late summer months of 1998 by lack of rainfall. 1998 had the third longest period on record with zero precipitation at the Olympia Airport (nearly 50 days). Some Christmas trees and small conifers on rocky soils in the vicinity of Shelton died.

The dry period was relieved by precipitation in September and October. In fact, November precipitation was above normal across the entire state. Parts of the Olympic Peninsula and Washington Cascades received well over 20 inches of precipitation that month.

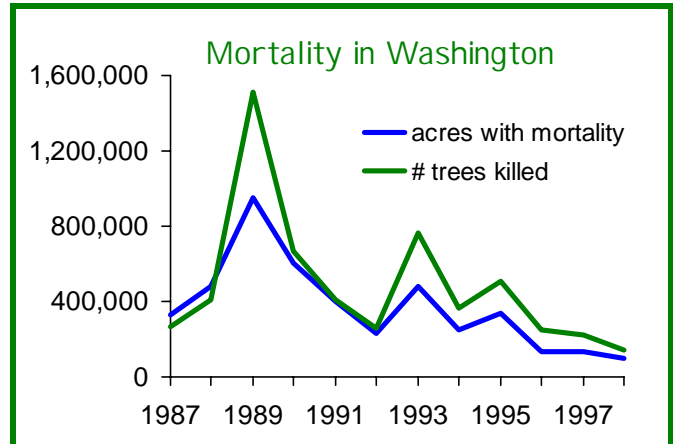
Defoliation Trends

Defoliation – primarily from western spruce budworm – has decreased in the past 7 years over much of eastern Washington. The Glenwood area, south of Mount St. Helens in southcentral Washington, is the exception: western spruce budworm has caused defoliation in this area since 1996.



Mortality Trends

Overall, trends show decreases in mortality in Washington over the past 15 years, due mainly to reduced bark beetle-caused mortality. Drought periods in the late 1980s and early 1990s, coupled with overstocked stands, contributed to increased mortality from insects and diseases. Alleviation of drought in the last decade has slowed rates of mortality, especially in pines east of the Cascades.



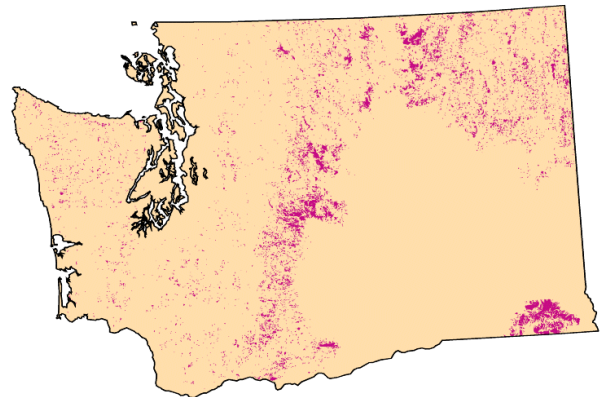
Cumulative Defoliation in Washington 1987-1992



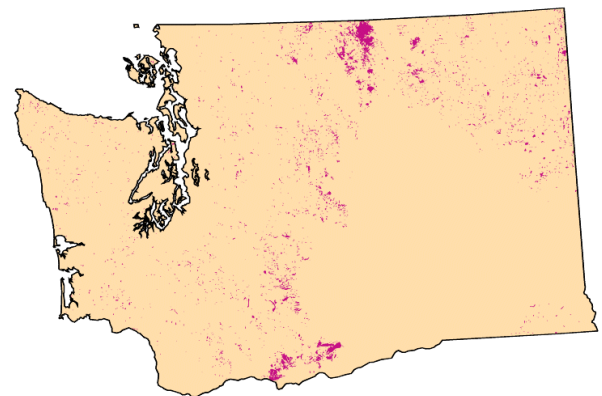
Cumulative Defoliation in Washington 1993-1998



Cumulative Mortality in Washington 1987-1992



Cumulative Mortality in Washington 1993-1998



Contacts and Additional Information

If you have questions about forest insect and disease activity in Oregon or Washington, please contact one of these regional or field offices:

States

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Forest Health Protection

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945-7397 (Alan Kanaskie)
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<http://www.odf.state.or.us/fa/FH/id.htm>

Washington

Forest Health Program

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902-1692 (Dan Omdal)
902-1320 (Jeff Moore)
(509) 684-7474 (Karen Johnson)
Email: forest_health@wadnr.gov

Forest Service

Forest Health Monitoring Program

Washington and Oregon
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Email: scampbell01@fs.fed.us
<http://www.fs.fed.us/pnw/fia/fhmpage/>

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website: <http://www.fs.fed.us/r6/nr/fid/>

Blue Mountains Service Center

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1401 Gekeler Lane
La Grande, OR 97850
(541) 962-6544 (Craig Schmitt)
962-6546 (Don Scott)
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Central Oregon Service Center

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