

United States  
Department of  
Agriculture

Forest Service

Forest  
Pest  
Management

Washington, DC

July 1989



# Forest Insect and Disease Conditions in the United States 1988

Technical Coordinators

Thomas H. Hofacker  
Robert C. Loomis  
Alison J. Worrall

# Mountain Pine Beetle

Mountain pine beetle (*Dendroctonus ponderosae*) populations generally decreased in 1988. The number of acres affected by this insect dropped slightly from a little over 2.4 million acres in 1987 to approximately 2.2 million acres in 1988. This is well below the yearly

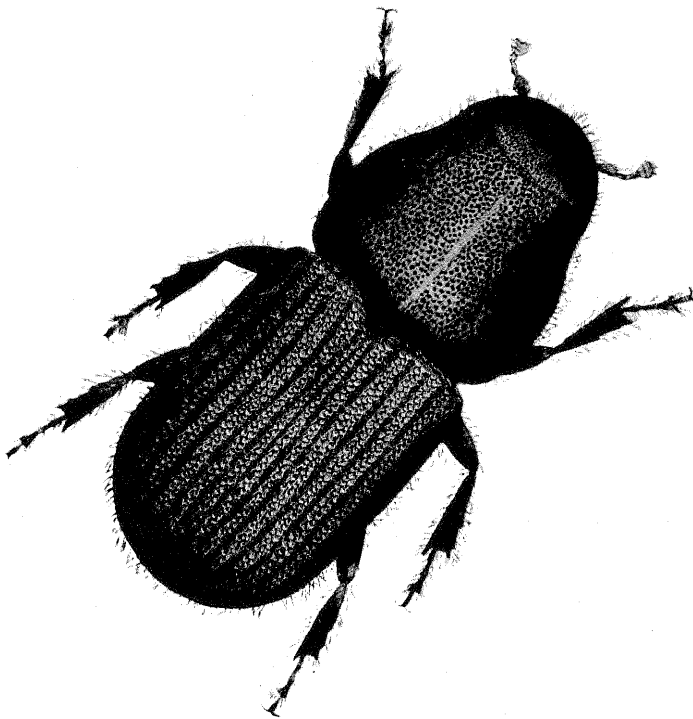
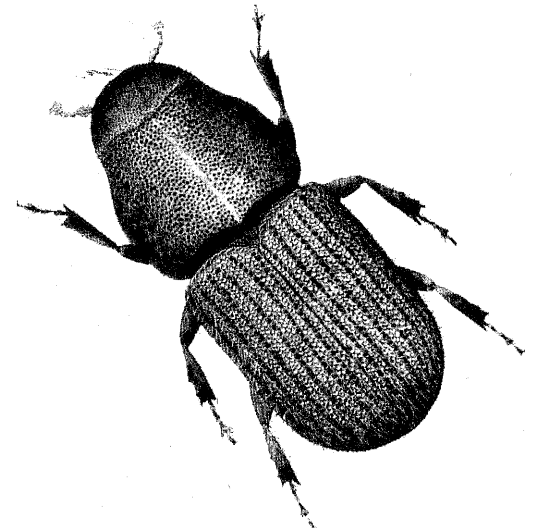
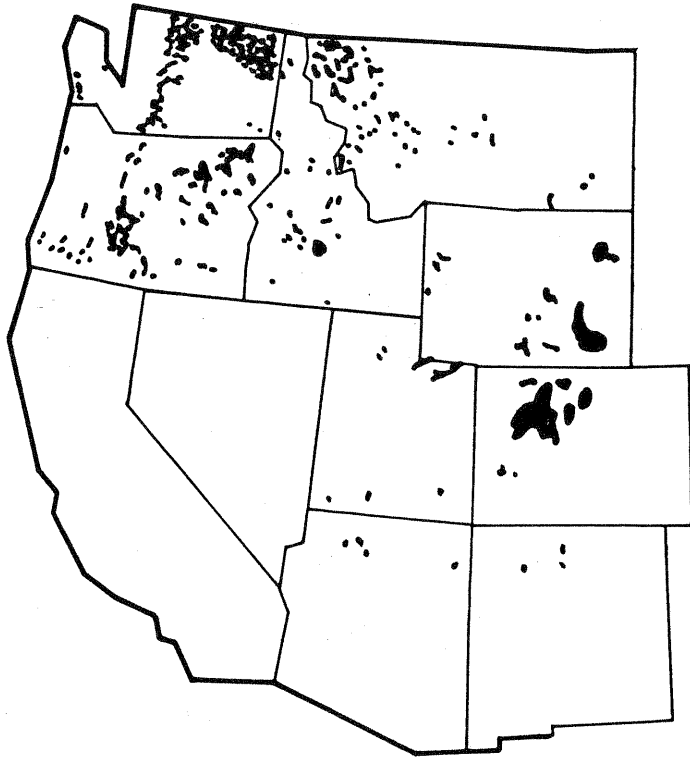
average of 3.5 million acres established during the first seven years of this decade. Washington was the only state that experienced a significant increase in beetle activity over 1987.

State	1987 Acres Affected	1988 Acres Affected	1988 Volume† Killed	1988 Number Of Trees Killed
Arizona	0	600	22	620
California	20,000	0	0	0
Colorado	2,500	13,000	1,300	82,500
Idaho	48,061	42,300	1,100	64,500
Montana	694,380	546,700	49,600	2,479,700
New Mexico	4,790	1,000	68	1,400
Oregon	1,400,000	1,311,400	42,700	2,879,200
South Dakota	2,340	2,600	23	7,100
Utah	97,400	12,500	400	21,000
Washington	158,000	220,300	4,700	224,600
Wyoming	14,700	55,600	1,200	88,900
<b>Total</b>	<b>2,442,171</b>	<b>2,206,000</b>	<b>101,113</b>	<b>5,849,520</b>

†Volume in thousand cubic feet of timber

---

1988 Mountain Pine Beetle Outbreak



# Western Spruce Budworm

From a record 13.2 million acres of defoliation in 1986, the total number of Western spruce budworm (*Choristoneura occidentalis*) defoliated acres declined by another 1.9 million acres in 1988. The decrease in defoliated acreage was especially prominent in Idaho, from 2.5 million defoliated acres in 1986 to 61,000 acres in 1988.

## Acres Of Aerially Detected Defoliation

State	1987	1988
Arizona	15,500	5,800
California	0	0
Colorado	833,000	427,000
Idaho	898,200	61,000
Montana	1,802,000	2,064,000
New Mexico	250,400	477,700
Oregon	3,700,000	2,740,400
Utah	37,700	0
Washington	400,000	231,600
Wyoming	16,300	55,800
<b>Total</b>	<b>7,953,125</b>	<b>6,063,300</b>

## 1988 Western Spruce Budworm Defoliation



# Pacific Northwest Region Insects

Prepared by David R. Bridgwater

Insect	Host	Location	Remarks
Douglas-fir beetle <i>Dendroctonus pseudotsugae</i>	Douglas-fir	Oregon, Washington	Douglas-fir beetle damage increased to 19 million cubic feet from slightly over 1 million cubic feet in 1987. Losses increased east of the Cascade Range and occurred on over 212,000 acres. The greatest damage was reported on the Colville, Umatilla, Wallowa-Whitman, and Malheur National Forests.
Fir engraver beetle <i>Scolytus ventralis</i>	True firs	Oregon, Washington	Fir engraver activity continued to increase in Oregon and Washington. Some of the fir engraver damage occurred on sites infected with either laminated root rot, armillaria root disease, or annosus root disease, all of which weaken true firs and make them susceptible to beetle attacks. However, much of the loss in 1988 was attributed to three years of less-than-normal precipitation. Total losses in 1988 (5.7 million cubic feet) occurred on over 267,000 acres compared to (639,200 cubic feet) in 1987 on 24,570 acres .
Gypsy moth <i>Lymantria dispar</i>	Conifers, Hardwoods	Oregon, Washington	Eradication projects in Oregon were conducted on 1,200 acres in Lane and Josephine counties.  Trapping efforts detected 10 moths in 1988, down from 80 moths in 1987. No moths were trapped on Federal lands in Oregon, and only one moth was caught on Federal land in Washington at Fort Lewis.
Modoc budworm <i>Choristoneura retiniana</i>	Douglas-fir, True firs	Southern Oregon	Modoc budworm defoliation continued to decrease in southern Oregon in true fir stands on the Fremont and Winema National Forests. Acres of visible defoliation decreased to about 13,600 in 1988 from 63,200 in 1987.

Insect	Host	Location	Remarks
Mountain pine beetle <i>Dendroctonus ponderosae</i>	Lodgepole pine, Ponderosa pine, Western white pine, Other pines	Oregon, Washington	<p>In Washington, losses continued at about the same level as 1987 and increased only on the Okanogan National Forest. In Oregon, losses decreased slightly on the Deschutes, Fremont, and Winema National Forests.</p> <p>In 1988, approximately 1.5 million acres were infested: 1.3 million acres in Oregon and 215,000 in Washington.</p> <p>Beetle losses in 1988 consisted of 1.2 million acres (43 million cubic feet) of lodgepole pine, 258,000 acres (2.6 million cubic feet) of ponderosa pine, 52,000 acres (2.3 million cubic feet) of western white pine, and about 14,000 acres of other pine species.</p>
Pine engraver beetles <i>Ips</i> spp.	Ponderosa pine	Oregon, Washington	<p>Pine engraver activity increased to over 27,300 acres. Most of the activity was on the Ochoco National Forest.</p>
Spruce beetle <i>Dendroctonus rufipennis</i>	Engelmann spruce	Oregon, Washington	<p>Spruce beetle activity increased in Oregon and Washington. Losses occurred on over 72,300 acres (8.7 million cubic feet) in 1988 compared to 31,030 acres (5.4 million cubic feet) in 1987. The outbreak on the Wallowa-Whitman National Forest accounted for 68,000 acres (8.6 million cubic feet) of the infested areas.</p>
Western pine beetle <i>Dendroctonus brevicomis</i>	Ponderosa pine	Oregon, Washington	<p>Tree mortality caused by the western pine beetle decreased slightly in Oregon and Washington to 2.3 million cubic feet in 1988 from 2.8 million cubic feet in 1987. Greatest losses occurred on the Malheur National Forest.</p>

Insect	Host	Location	Remarks
Western spruce budworm <i>Choristoneura occidentalis</i>	Douglas-fir, Engelmann spruce, True firs, Western larch	Oregon, Washington	<p data-bbox="932 289 1523 384">Visible defoliation caused by the western spruce budworm decreased to 3.0 million acres in 1988 from 4.1 million acres in 1987.</p> <p data-bbox="932 457 1523 646">In Oregon, budworm defoliation decreased on the Malheur, Mt. Hood, Willamette, Deschutes, Ochoco, Wallowa-Whitman, and Umatilla National Forests, on the Warm Springs Indian Reservation, and on intermingled State and private lands.</p> <p data-bbox="932 678 1523 804">In Washington, the size of the budworm infestation on the Okanogan and Wenatchee National Forests and adjacent State and private lands decreased.</p>

# Pacific Northwest Region Diseases

Prepared by Ellen M. Goheen

Disease	Host	Location	Remarks
<b>Stem and Branch Diseases</b>			
Dwarf mistletoes <i>Arceuthobium</i> spp.	Various conifers	Oregon, Washington	Losses due to this group of disease-causing plants declined. However, dwarf mistletoes still caused an estimated loss of 131 million cubic feet of timber in Oregon and Washington in 1988.
Branch cankers <i>Phomopsis</i> spp. <i>Sclerophoma</i> spp. <i>Dermea</i> spp. <i>Cytospora</i> spp.	Douglas-fir	Oregon, Washington	Top, branch and whole tree killing, associated primarily with drought and secondarily with complexes of canker fungi, were found on plantations and in pole-size stands of the Cascades.
Stem decay <i>Phellinus pini</i> <i>Echinodontium tinctorium</i> And other Basidiomycetes	Various conifers	Oregon, Washington	Stem decay fungi destroyed enormous volumes of wood. Most losses occurred in younger stands of thin-bark species that were susceptible to wounding during stand entries. Wounding of residual trees activated dormant infections and made trees susceptible to new infections.
White pine blister rust <i>Cronartium ribicola</i>	Sugar pine, Western white pine	Oregon, Washington	Annual losses of western white and sugar pines from blister rust in Oregon and Washington have been estimated at 15 million cubic feet. Rust-resistant planting stock was available for regenerating stands. Interest in pruning white pine stands continued to increase.



Disease	Host	Location	Remarks
<b>Root Diseases</b>			
Root diseases	Various conifers	Oregon, Washington	Root diseases were among the most serious pest problems in Oregon and Washington forests. The incidence of root disease increased, often in direct response to human activity. Annual losses to root diseases on all ownerships has been estimated at over 170 million cubic feet. A root disease model that operates as part of the Stand Prognosis Model was being tested. The model can be used to project losses caused by <i>Armillaria</i> root disease and laminated root rot.
Annosus root disease <i>Heterobasidion annosum</i>	True firs, Western hemlock, Ponderosa pine	Oregon, Washington	Annosus root disease was responsible for extensive losses in many partially cut white and grand fir stands in southern and eastern Oregon. Most loss was due to tree mortality. Evidence pointed to extensive infection throughout eastern Oregon and Washington. Severity was expected to increase with time. Annosus root disease was observed with increasing frequency in ponderosa pine stands on very dry sites in southeast Oregon. Attempts to further characterize those site and stand conditions were being made.
Armillaria root disease <i>Armillaria ostoyae</i>	Various conifers	Oregon, Washington	The most serious losses to this disease occurred east of the Cascades. Losses west of the Cascades were usually confined to stressed stands, such as off-site plantings. Planting tolerant or resistant species was being practiced as a control measure.

Disease	Host	Location	Remarks
Black stain root disease <i>Ceratocystis wagneri</i>	Douglas-fir	Oregon, Washington	In southwestern Oregon, this was by far the most commonly encountered disease in Douglas-fir plantations. It appeared to be particularly damaging where disturbances had occurred, especially in roadside Douglas-fir cut back by mechanical choppers. Losses were also greater on tractor-logged sites, which have greater soil compaction, than on cable-logged sites. A survey of 500 10- to 30-year-old Douglas-fir plantations on the Medford District, Bureau of Land Management, was completed. Approximately 18 percent of the plantations were infected, although severity was generally low.
Laminated root rot <i>Phellinus weirii</i>	Douglas-fir, Grand fir, White fir	Oregon, Washington	Laminated root rot was estimated to have removed about 8 percent of the Douglas-fir type west of the Cascades from full production. The total acreage infected may actually have been closer to 10 percent of the Douglas-fir. Damage was also severe in some East Side grand and white fir stands. Tolerant and resistant species were favored or planted to suppress this disease.
Port-Orford-cedar root disease <i>Phytophthora lateralis</i>	Port-Orford-cedar	Southwestern Oregon	Port-Orford-cedar root disease continued to cause widespread mortality of Port-Orford-cedar in southwestern Oregon.
<b>Foliage Diseases</b>			
Dothistroma needle blight <i>Mycosphaerella pini</i> [ <i>Dothistroma septospora</i> (= <i>Dothistroma pini</i> )]	Douglas-fir, Lodgepole pine, Ponderosa pine	Oregon, Washington	Incidence of several foliage diseases was relatively low because of dry weather in the spring and fall of the past 4 years.
Douglas-fir needle cast <i>Rhabdocline pseudotsugae</i>			
Elytroderma disease <i>Elytroderma deformans</i>			

Disease	Host	Location	Remarks
<b>Nursery Diseases</b>			
Damping-off	Most conifers	Oregon, Washington	Loss of seedlings, before and shortly after emergence accounted for the majority of mortality in Pacific Northwest bareroot nurseries. Losses ranged from less than 1 percent to over 20 percent in various lots. Fumigation provided the best control of damping-off.
Douglas-fir canker diseases <i>Phoma eupyrena</i> <i>Fusarium roseum</i> <i>Botrytis cinerea</i> <i>Phomopsis</i> spp.	Douglas-fir	Oregon, Washington	Damage was scattered, with less than 1 percent of the crop affected in most nurseries. Fungicide applications were helpful when cankers were above ground and not covered with soil collars.
Gray mold <i>Botrytis cinerea</i>	Douglas-fir	Oregon, Washington	Damage by gray mold has been low (less than 1 percent of crop affected) due to applications of preventative fungicide and regulation of seedbed densities.
Fusarium root and hypocotyl rots <i>Fusarium oxysporum</i>	Various conifers	Oregon, Washington	Scattered losses were reported for most species; mortality was heavy in sugar pine.
Larch needle cast <i>Meria laricis</i>	Western larch	Washington	Dry weather and fungicide treatments resulted in little infection or defoliation during 1988.
Phytophthora root rot <i>Phytophthora</i> spp.	Douglas-fir, other conifers	Oregon, Washington	Moderately dry weather throughout summer, fall, and winter caused disease severity to be relatively low in 1988. Seedbed seedling damage was confined primarily to nursery beds with poor drainage or compaction layers in the rooting zone.