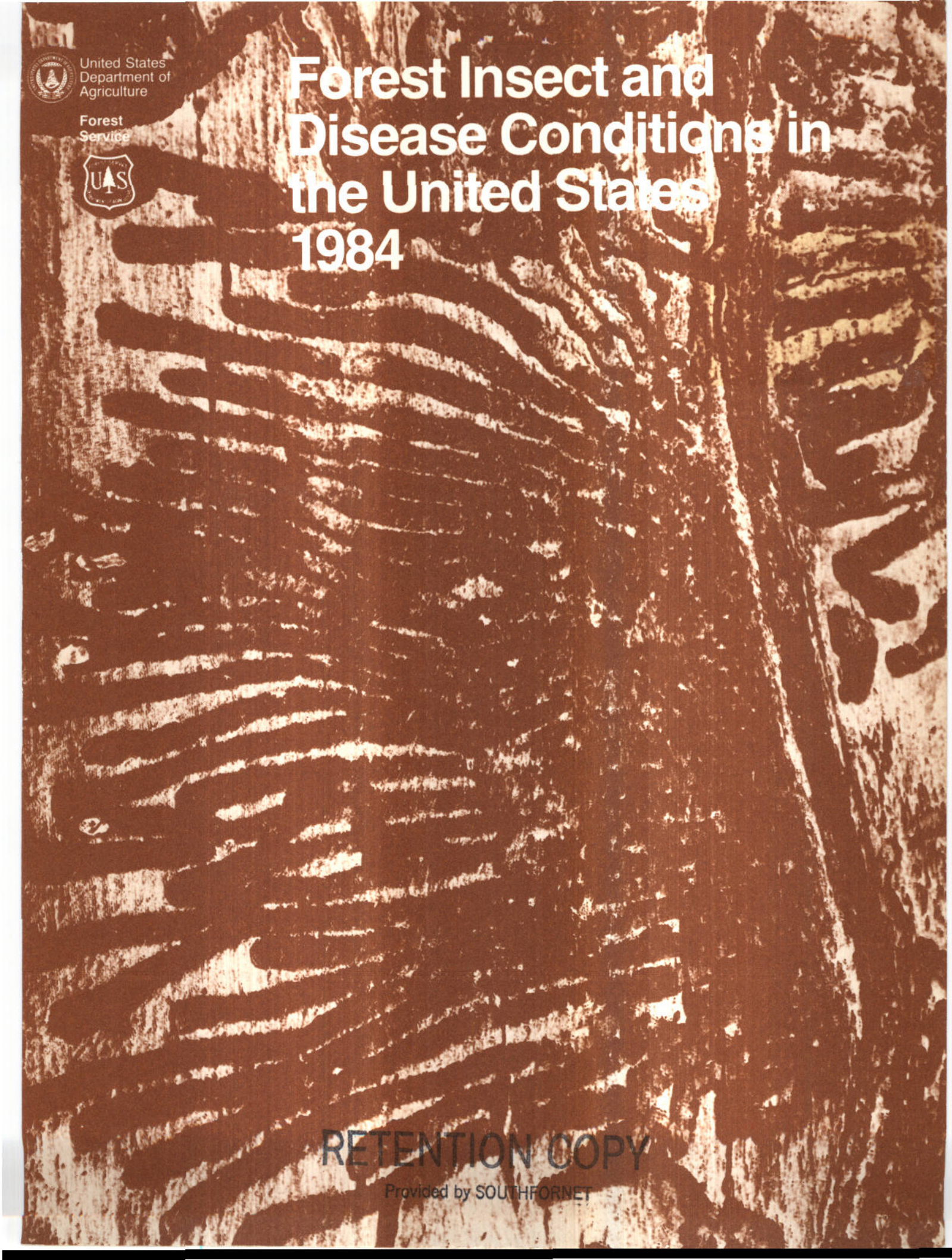
United States
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Forest Insect and
Disease Conditions in
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1984
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United States
Department of
Agriculture

**Forest
Service**

May 1985

Forest Insect and Disease Conditions in the United States 1984

Regional Forest Pest Management offices:

Northern Region (R-1)
USDA Forest Service
Federal Building
Missoula, MT 59807

Rocky Mountain Region (R-2)
USDA Forest Service
P.O. Box 25127
Lakewood, CO 80225

Southwestern Region (R-3)
USDA Forest Service
Federal Building
517 Gold Avenue, S.W.
Albuquerque, NM 87102

Intermountain Region (R-4)
USDA Forest Service
Federal Building
324 25th Street
Ogden, UT 84401

Pacific Southwest Region (R-5)
USDA Forest Service
630 Sansome Street
San Francisco, CA 94111

Pacific Northwest Region (R-6)
USDA Forest Service
P.O. Box 3623
Portland, OR 97208

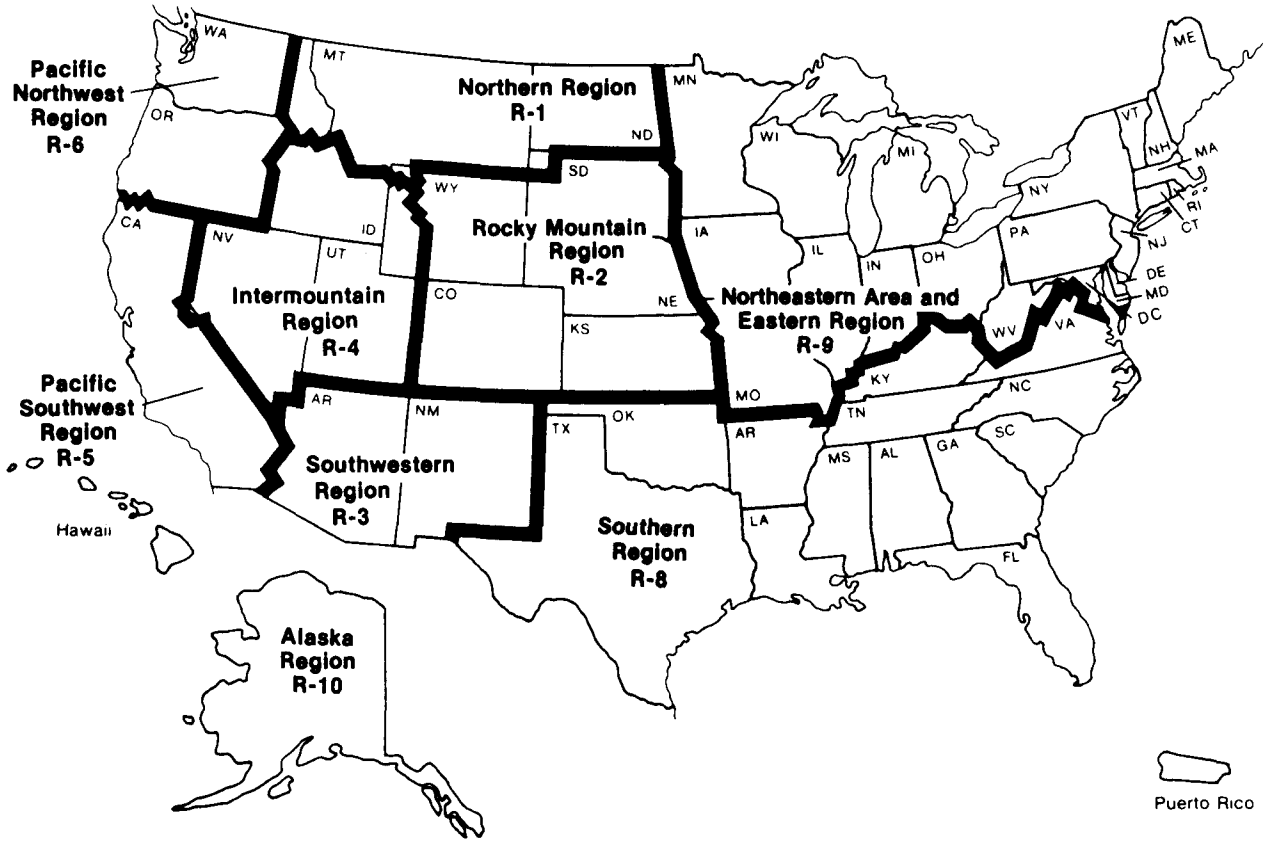
Southern Region (R-8)
USDA Forest Service
1720 Peachtree Road, N.W.
Atlanta, GA 30367

Eastern Region (R-9) and
Northeastern Area
USDA Forest Service
370 Reed Road
Broomall, PA 19008

Alaska Region (R-10)
USDA Forest Service
2221 E. Northern Lights Blvd.
Suite 104
Anchorage, AK 99504

Cover photo: Douglas-fir beetle gallery on inner bark

USDA Forest Service Regions and Area



This publication reports information involving pesticides. It does not contain recommendations for their use, nor does it imply the uses discussed here have been registered. All uses of pesticides must be registered by appropriate State and/or Federal agencies before they can be recommended.

Caution: Pesticides can be injurious to human beings, domestic animals, desirable plants, fish, or wildlife if they are not handled or applied properly. Use all pesticides selectively and carefully. Follow recommended practices for the disposal of surplus pesticides and pesticide containers.

Preface

This 34th annual report, published by the U.S. Department of Agriculture, Forest Service, Forest Pest Management, reports the status of insects and diseases on the Nation's forests during 1984.

The conditions information has been summarized by pest in the first part of the report. This section also includes an overview of pesticide use for insect and disease control.

The summary section is followed by more detailed information on the pest conditions in the nine USDA Forest Service Regions nationwide. Each Region has an insect conditions table and a disease conditions table.

Much of the information in this publication is based on special aerial or ground surveys. These surveys record short-term changes in pest activity, and they supplement the tree mortality information gathered in periodic forest resource inventory surveys done by the Forest Service.

As in past years, Forest Pest Management offices nationwide compiled the information for lands of all ownerships. Further information can be obtained from the Forest Pest Management offices listed on page ii.

We appreciate the assistance of all State, Federal, and private cooperators who provided the information contained in this report.

Robert C. Loomis, Staff Pathologist
Thomas H. Hofacker, Staff Entomologist
Susan M. Tucker, Editor

U.S. Department of Agriculture
Forest Service
Forest Pest Management
P.O. Box 2417
Washington, DC 20013

Contents

Forest Insect and Disease Conditions
in the United States
1984

Washington, DC
May 1985

Part 1. National Summary

Gypsy Moth

In 1984, gypsy moth (Lymantria dispar) defoliation dropped below the million acre mark for the first time in the last 5 years. This total represents a 12-million-acre decline in defoliation from the peak level reached in 1981.

In addition, 33 isolated infestations remote from the generally infested area were present in 12 States during 1984. States with isolated infestations are California, Illinois, Indiana, Michigan, Minnesota, North Carolina, Ohio, Oregon, Tennessee, Virginia, Washington, and Wisconsin.

Acres of aerially detected defoliation caused by the gypsy moth in the Northeast

State	1983	1984
	Acres	
Connecticut	153,239	544
Delaware	2,992	14,203
Maine	16,285	1,892
Maryland	15,870	41,824
Massachusetts	148,133	185,520
Michigan	457	6,425
New Hampshire	560	0
New Jersey	340,285	98,695
New York	290,843	33,678
Pennsylvania	1,360,824	444,900
Rhode Island	53,880	164,600
Vermont	0	0
Virginia	0	374
Total	2,383,368	992,655

1984 Gypsy Moth Defoliation

In the West, a large, isolated gypsy moth infestation near Eugene, OR, is a special concern. This infestation, discovered in 1984, is well established and appears to have been introduced 5 to 7 years ago. The exact size of the infestation remains uncertain because moth flight ended before detection survey traps could be placed in all suspect areas. It appears that as many as 300,000 acres may be infested. For the first time, the gypsy moth was observed defoliating Douglas-fir.

Over the last several years, widespread tree mortality following drought and gypsy moth defoliation has been noted in many areas. In 1984, the Pennsylvania Bureau of Forestry conducted a survey of affected areas in that State to assess the extent and severity of tree mortality. The survey showed that about 350,000 acres of moderately affected forest had 27.6 percent mortality in pulpwood-sized trees and 32.5 percent mortality in sawtimber. Another 341,000 acres experienced more severe mortality. On these acres, the mortality rate for both pulpwood and sawtimber averaged 51.3 percent. Losses in these areas totaled about 218 million cubic feet of pulpwood and 950.8 million board feet of sawtimber.

In New York, mortality from the 1980-82 outbreak now totals 30 million board feet.

Southern Pine Beetle

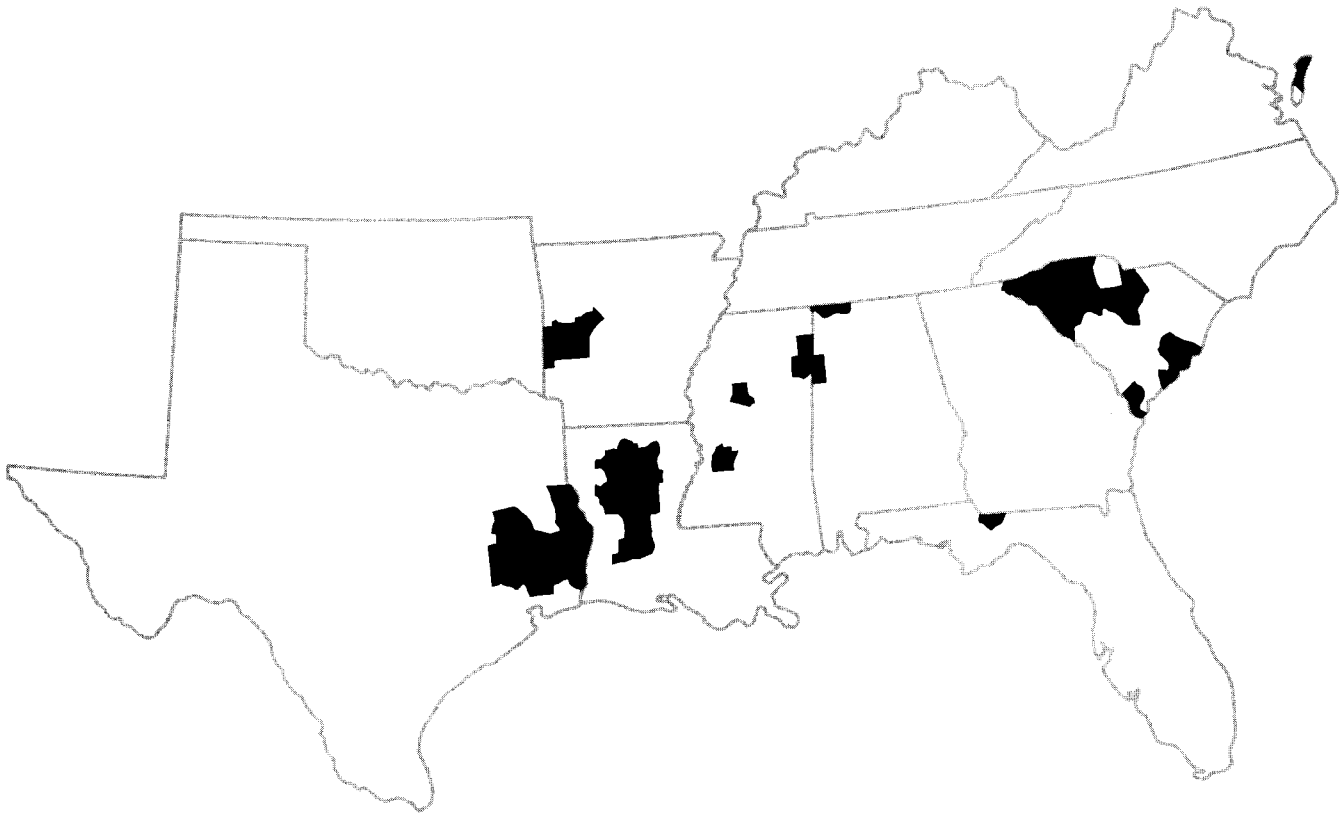
Across the South, southern pine beetle (Dendroctonus frontalis) activity in 1984 was generally lower than in 1983. Beetle populations in Alabama, Arkansas, Georgia, and South Carolina collapsed to very low levels. However, the severe outbreak in Texas continued to expand: 4,800 new infestations were reported. Also, population increases were detected in Louisiana and Mississippi late in 1984.

Southern pine beetle outbreak counties *

Alabama: Lamar, Lauderdale
Arkansas: Montgomery, Polk, Scott, Yell
Florida: Gadsden
Georgia: Rabun
Louisiana: Allen, Caldwell, Evangeline, La Salle, Winn, Grant, Natchitoches, Rapides, Jackson, Bienville, Ouachita, Lincoln
Mississippi: Carroll, Hinds, Itawamba, Monroe
South Carolina: Berkeley, Charleston, Jasper, Lancaster, Kershaw, Richland, Fairfield, Cherokee, Union, Newberry, McCormick, Greenwood, Laurens, Spartanburg, Greenville, Abbeville, Anderson, Pickens, Oconee
Texas: Shelby, Sabine, Newton, Orange, Hardin, Tyler, Jasper, Liberty, San Augustine, San Jacinto, Polk, Trinity, Houston, Walker, Montgomery
Virginia: Accomack

* More than one multiple-tree spot per 1,000 acres.

1984 Southern Pine Beetle Outbreak Counties



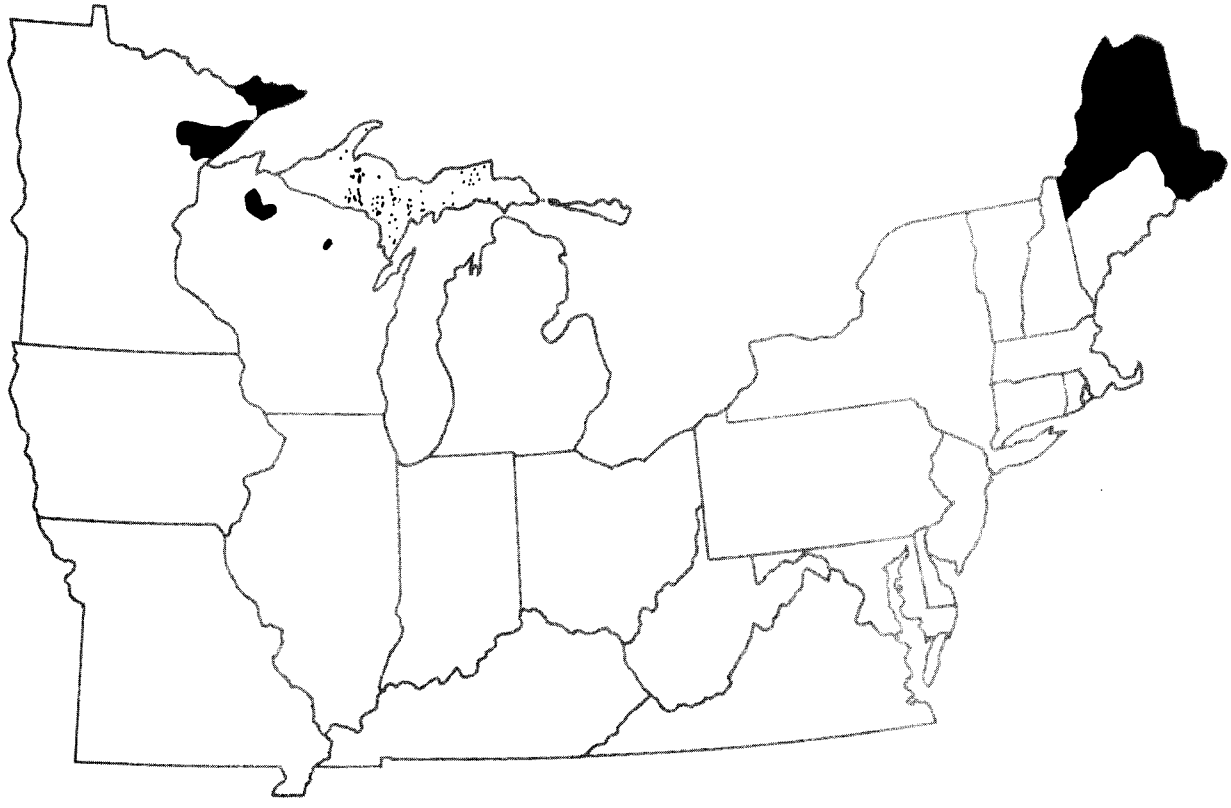
Spruce Budworm

Spruce budworm (Choristoneura fumiferana) defoliation declined slightly in 1984 to 6.1 million acres. Maine remains the most severely affected State, but budworm populations are generally on the decline in New England. In the Lake States, populations are increasing: 575,844 acres were defoliated in 1984. Losses in the Lake States are now estimated to be 1,761,356 cords.

Acres of aerially detected defoliation caused by the spruce budworm in the Eastern United States

State	1983	1984
	Acres	
Maine	6,000,000	5,500,000
Michigan	145,952	192,394
Minnesota	138,700	361,600
New Hampshire	5,800	930
Vermont	178,000	0
Wisconsin	20,000	22,050
Total	6,488,452	6,076,974

1984 Spruce Budworm Defoliation



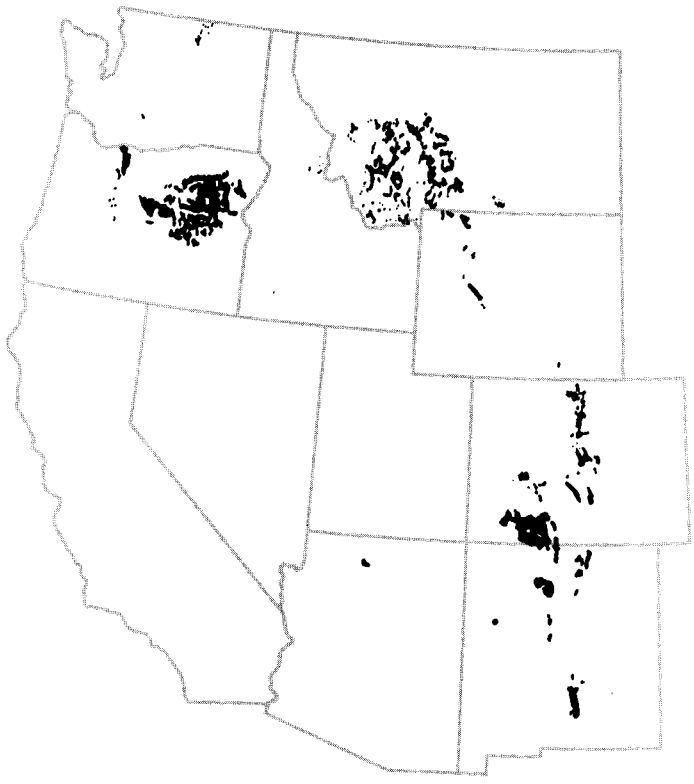
Western Spruce Budworm

In 1984, western spruce budworm (Choristoneura occidentalis) defoliation remained static, at a high level. About 10.6 million acres of visible defoliation were recorded in 1984.

Acres of aerially detected defoliation caused by the western spruce budworm in the United States

Region	1983	1984
	Acres	
Northern (R-1)	2,600,000	2,250,000
Rocky Mountain (R-2)	2,750,311	2,220,000
Southwest (R-3)	371,549	692,100
Intermountain (R-4)	2,800,000	2,375,000
Pacific Southwest (R-5)	0	0
Pacific Northwest (R-6)	2,477,000	3,096,650
Total	10,998,860	10,633,750

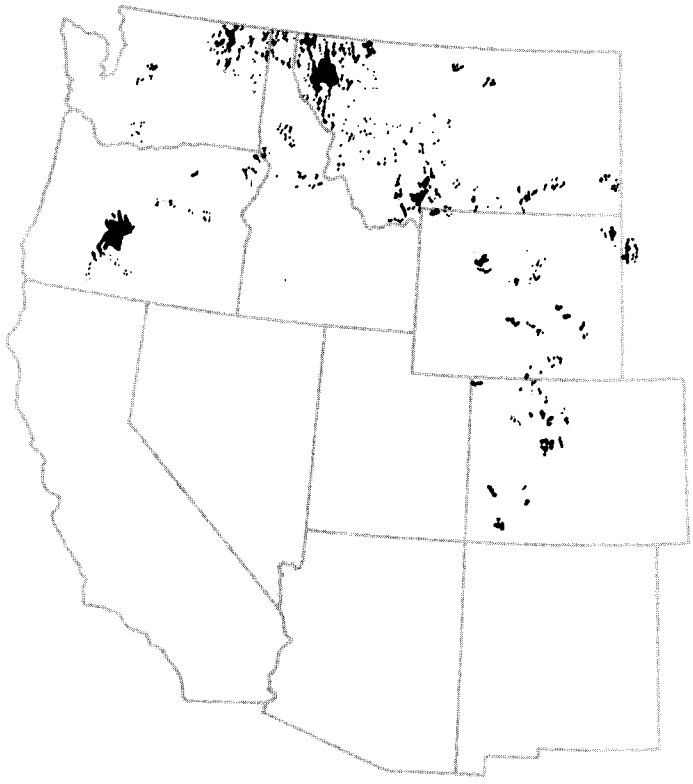
1984 Western Spruce Budworm Defoliation



Mountain Pine Beetle

Mountain pine beetle activity remained static at a high level in 1984. While outbreaks in some areas are collapsing, new areas of attack appear. Outbreak areas covered approximately 3.3 million acres in 1984.

1984 Mountain Pine Beetle Outbreak Areas



Disease Conditions in the East

Fusiform rust (Cronartium quercuum f. sp. fusiforme) and annosus root disease (Heterobasidion annosum) caused considerable damage to southern pine forests.

Fusiform rust stem infections occur on at least 10 percent of the pines growing on about 15 million acres in the South.

Annosus root disease hazard is greatest on deep, sandy soils with good internal drainage. These soils occur on about 20 percent of the South's land base.

Dieback and mortality of several tree species were reported again this year, especially dieback and mortality of oak in the South and of ash, birch, fir, larch, maple, oak, and spruce in the Northeast. Environmental stress, coupled with pest activity, appears to be contributing to many of the reported tree decline problems. The possible effects of man-caused stress are also being investigated.

Acres of slash and loblolly stands in the South with about 10 percent or more of the trees infected with fusiform rust on or within 12 inches of the main stem, 1984

State	Landownership class				
	National Forest	Other Federal	State	Private	Total
			Acres		
Alabama	61,900	20,100	20,100	1,938,900	2,041,000
Arkansas	6,500	1,200	800	50,400	58,900
Florida	47,000	28,400	22,500	1,020,200	1,118,100
Georgia	37,328	139,619	36,170	5,083,927	5,297,044
Louisiana	61,300	15,700	31,400	1,461,700	1,570,100
Mississippi	86,500	6,700	6,800	1,585,200	1,685,200
North Carolina	3,854	8,716	25,769	1,100,716	1,139,055
South Carolina	73,081	45,819	14,699	1,362,877	1,496,476
Texas	36,500	1,300	1,400	461,800	501,000
Virginia	0	0	0	6,000	6,000
Total	413,963	267,554	159,638	14,071,720	14,912,875

Disease Conditions in the West

In the West, root diseases and dwarf mistletoes (Arceuthobium spp.) were the most damaging diseases. Other important conifer diseases included foliage diseases, which were numerous and widespread; white pine blister rust, which caused lethal stem and branch cankers and is the most important disease of western white and sugar pines; and stem decay, which continued to cause considerable damage in old-growth conifer stands.

Loss caused by dwarf mistletoes, 1984

State	Acres infested	Cubic feet lost
Montana	2,416,000	33,250,000
Northern Idaho	713,000	13,420,000
Colorado *	638,000	5,490,000
Eastern Wyoming *	361,000	4,960,000
Arizona *	982,000	8,140,000
New Mexico *	1,793,000	16,570,000
Southern Idaho	2,511,000	28,860,000
Utah	461,000	4,750,000
Nevada	62,000	580,000
Western Wyoming	276,000	3,290,000
California	2,200,000	120,000,000
Oregon	4,885,000	76,560,000
Washington	3,575,000	55,440,000
Michigan	74,000	3,740,000
Minnesota	155,000	6,740,000
Wisconsin	54,000	670,000
Alaska	1,500,000	11,000,000
Total	22,656,000	393,460,000

* National Forest System lands only.

Average annual root disease-caused mortality in the Western United States

Region	National Forest lands	Other lands	Total
	1,000 cubic feet		
Northern (R-1)	54,400	26,300	80,700
Rocky Mountain (R-2)	127 *	NA **	127
Southwest (R-3)	2,900	1,850	4,750
Intermountain (R-4)	1,400	215	1,615
Pacific Southwest (R-5)	12,282	7,091	19,373
Pacific Northwest (R-6)	51,453	80,478	131,931
Total	122,562	115,934	238,496

* A partial estimate for one forest type only.
** Insufficient data available to make an estimate.

Pesticide Use for Insect and Disease Control

Pesticide use in forestry averages an estimated 1 percent of the total used in the United States annually. This includes all forestry uses, such as insect and disease control, site preparation, and soil treatment.

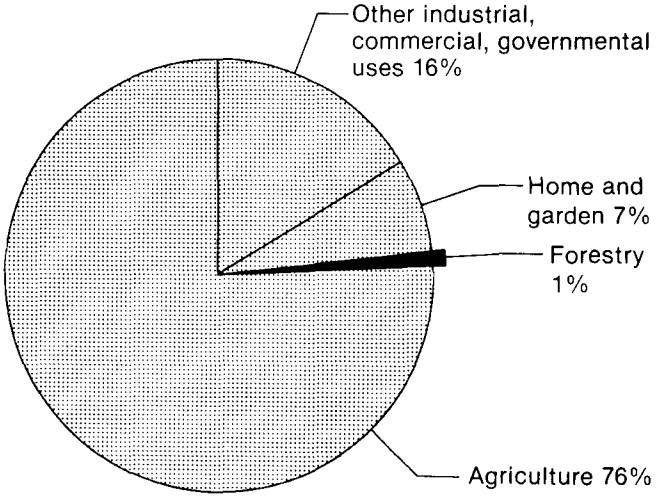
The small amount of pesticides used in forestry is reflected in the National Forest System's use of insecticides. From 1974 to 1984, only about one-tenth of 1 percent of its 191 million acres were treated each year with insecticides. The yearly average was about 220,000 acres, mostly to control the western spruce budworm.

Acephate, carbaryl, lindane, and malathion are among the most commonly used chemical insecticides, while the biological insecticide *Bacillus thuringiensis* has seen more extensive use in recent years. Pheromones and other behavioral chemicals have also gained more attention in forest insect management programs.

Pesticides are important in protecting seed orchards and nurseries, which produce genetically improved seed and seedlings. The most commonly used fungicide for disease control in nurseries is methyl bromide, a fumigant that controls soilborne fungi. Benomyl, captan, and chlorothalonil are other frequently used fungicides.

A detailed summary of Forest Service pesticide use is included in "Report of the Forest Service," a report submitted each year to Congress.

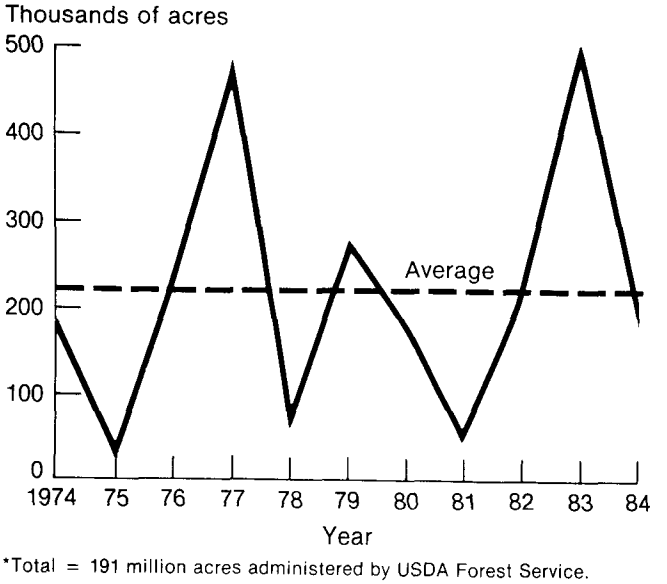
Pesticide Use in the United States*



Total use = 953 million pounds of active indredient

*Based on U.S. Environmental Protection Agency and USDA Forest Service estimates in 1983.

Insecticide Use
National Forest System Lands*
1974-1984



*Total = 191 million acres administered by USDA Forest Service.

Part 2. Regional Conditions

Northern Region—Insects

Northern Region—Status of insects in Montana, northern Idaho, North Dakota, northwestern South Dakota, and National Park Service lands in northwestern Wyoming

Insect	Host	Location	Remarks
Balsam woolly adelgid *Adelges piceae*	Grand fir, subalpine fir	Idaho	Activity persisted in 1984—despite severe cold winter weather. New activity occurred near Elk River, Fernwood, Santa, and south of Boville.
Black pineleaf scale *Nuculaspis californica*	Ponderosa pine	Idaho	This scale caused damage along the Clearwater River drainage west of Orofino. Severest damage occurred west of Lenore and on the south side of the Potlatch River downstream from Juliaetta.
Cranberry girdler moth *Chrysoteuchia topiaria*	Douglas-fir, western larch	Idaho	This sod webworm has been causing problems at the Coeur d'Alene Nursery since 1980. Insecticide sprays in 1984 reduced the incidence of the insect.
Douglas-fir beetle *Dendroctonus pseudotsugae*	Douglas-fir	Idaho, Montana, Wyoming	Beetle activity increased fivefold in northern Idaho from 1983 to 1984. The major increase was along the Selway River within the Idaho portion of the Bitterroot National Forest. Activity remained static in Montana and Yellowstone National Park, WY.
Douglas-fir engraver *Scolytus unispinosus*	Douglas-fir	Montana	Several acres infested on the Flathead and Lolo National Forests.
Douglas-fir tussock moth *Orgyia pseudotsugata*	Douglas-fir, spruce, true firs	Idaho, Montana	Ornamental trees defoliated along U.S. Highway 95 south of Genesee and at the Coeur d'Alene Nursery in Idaho. In Montana, defoliation was noted in Missoula and Somers. Pheromone trapping of adult male moths showed a general downward trend in both States.
Fir engraver *Scolytus ventralis*	Grand fir, subalpine fir	Idaho	Populations decreased in Idaho except near Weippe, where attacks more than doubled.

Northern Region—Status of insects in Montana, northern Idaho, North Dakota, northwestern South Dakota, and National Park Service lands in northwestern Wyoming—Continued

Insect	Host	Location	Remarks
Gypsy moth *Lymantria dispar*	Hardwoods	Idaho, Montana	Although no gypsy moths have yet been caught in pheromone traps in Idaho, the moth was caught in Montana in 1983. The trapping program was intensified in 1984, and one male moth was caught in a trap in Glacier National Park.
Larch budmoth *Zeiraphera improbana*	Western larch	Montana	Infestations of budmoth appeared for the first time in 1983, but none of these infested areas were very obvious in 1984. Most of the budmoth damage was mixed in with larch casebearer defoliation, especially along the Mission Mountains on the Flathead Indian Reservation.
Larch casebearer *Coleophora laricella*	Western larch	Idaho, Montana	Defoliation by the larch casebearer increased in localized areas in northern Idaho, especially within the Priest River drainage, around Pend Oreille Lake, and within the Coeur d'Alene River drainage. In Montana, defoliation increased on the Flathead, Kootenai, and Lolo National Forests and on the Flathead Indian Reservation.
Lodgepole terminal weevil *Pissodes terminalis*	Lodgepole pine	Montana	This weevil is still a chronic problem in many lodgepole pine plantations.

Northern Region—Status of insects in Montana, northern Idaho, North Dakota, northwestern South Dakota, and National Park Service lands in northwestern Wyoming—Continued

Insect	Host	Location	Remarks
Mountain pine beetle *Dendroctonus ponderosae*	Lodgepole pine, ponderosa pine, other pines	Idaho, Montana, Wyoming	Infestations increased in northern Idaho; major new beetle activity occurred on the Red River and Elk City Ranger Districts, Nezperce National Forest. In Montana, infestations increased on the Custer, Deerlodge, Flathead, Helena, and Kootenai National Forests. Activity decreased slightly or remained about the same on the Beaverhead, Bitterroot, Gallatin, Lewis and Clark, and Lolo National Forests. The infestation declined in Glacier National Park, MT, and Yellowstone National Park, WY. Infestations increased on the Blackfoot, Crow, and Northern Cheyenne Indian Reservations, but decreased on the Flathead and Rocky Boy Indian Reservations. A new infestation occurred on the Ft. Belknap Indian Reservation in lodgepole pine. Infestations decreased on Bureau of Land Management lands throughout Montana. Beetle infestations cover about 848,000 acres of lodgepole pine and about 35,000 acres of ponderosa pine, whitebark pine, and western white pine.
Pine bark aphid *Pineus sylvestris*	Scotch pine	Montana	Populations of this aphid were much lower than last year. Damage levels were also down.
Pine butterfly *Neophasia menapia*	Lodgepole pine, ponderosa pine	Idaho, Montana	Adult butterflies were noted near Coeur d'Alene, ID, flying in the tops of large ponderosa pine, but no visible defoliation was detected in either Idaho or Montana.
Pine engraver beetle *Ips pini*	Pines	Idaho, Montana	In Idaho, pine engraver mortality decreased, except in the Craig Mountain area, where it increased nearly thirtyfold from 1983 to 1984. Activity remained fairly static in Montana.

Northern Region—Status of insects in Montana, northern Idaho, North Dakota, northwestern South Dakota, and National Park Service lands in northwestern Wyoming—Continued

Insect	Host	Location	Remarks
Pine needle sheathminer *Zelleria haimbachi*	Lodgepole pine, ponderosa pine	Montana	Defoliation was widespread in 1984. Damage was noticeable in ponderosa pine on the Helena National Forest, the Flathead Indian Reservation, and the Bitterroot Valley. Damage was apparent in several lodgepole pine stands north of Bozeman and in several thousand acres of lodgepole pine south of Bozeman.
Spruce beetle *Dendroctonus rufipennis*	Engelmann spruce, other spruces	Idaho, Montana	Spruce beetle activity continued to decline in Idaho except on the Bonners Ferry Ranger District, Panhandle National Forests, where it increased slightly. Activity in Montana decreased markedly.
Variable oakleaf caterpillar *Heterocampa manteo*	Aspen, basswood, bur oak	North Dakota	Populations of this hardwood defoliator collapsed in 1984.
Western balsam bark beetle *Dryocoetes confusus*	Subalpine fir	Montana, Wyoming	Infestations occurred mainly on the Beaverhead, Flathead, Gallatin, and Kootenai National Forests in Montana. Minor infestations also occurred on the Bitterroot, Custer, Helena, Lewis and Clark, and Lolo National Forests and Glacier National Park in Montana, and Yellowstone National Park in Wyoming.
Western pine shoot borer *Eucosma sonomana*	Ponderosa pine	Idaho, Montana	Pine shoot borer is still causing height growth reduction in plantations in Idaho and Montana.
Western spruce budworm *Choristoneura occidentalis*	Douglas-fir, spruce, true firs	Idaho, Montana, Wyoming	Defoliation was detected on the Nezperce National Forest, ID, for the first time since 1979. The only other defoliation in Idaho was on the Bitterroot National Forest. In Montana and Wyoming, visible defoliation on lands of all ownerships decreased. Defoliation decreased from 2.6 million acres in 1983 to almost 2.3 million acres in 1984.

Northern Region—Status of insects in Montana, northern Idaho, North Dakota, northwestern South Dakota, and National Park Service lands in northwestern Wyoming—Continued

Insect	Host	Location	Remarks
Western tussock moth probably Orgyia vetusta	Curlleaf mahogany	Montana	About 130 acres of mahogany were severely defoliated on Bureau of Land Management land northwest of Twin Bridges. This may be the first recorded outbreak of this moth on mahogany in Montana.

Northern Region—Diseases

Northern Region—Status of diseases in Montana, northern Idaho, North Dakota, northwestern South Dakota, and National Park Service lands in northwestern Wyoming

Disease	Host	Location	Remarks
STEM AND BRANCH DISEASES			
Atropellis canker *Atropellis piniphila*	Lodgepole pine	Idaho, Montana	In Montana, severe damage occurs on the Helena National Forest and the Flathead Indian Reservation. In Idaho, isolated areas of lodgepole pine are infected.
Comandra blister rust *Cronartium comandrae*	Lodgepole pine, ponderosa pine	Idaho, Montana	Comandra rust is common on lodgepole and ponderosa pines in many parts of both States. Cankers were prevalent on lodgepole pine on the Gallatin National Forest, south of Bozeman, MT.
Dwarf mistletoes			
Arceuthobium americanum	Lodgepole pine	Idaho, Montana	Although mortality is rare, growth reduction in heavily infested stands is substantial. Dwarf mistletoes infest about 3.1 million acres in the two States. Nearly 47 million cubic feet of growth are lost annually on lands of all ownerships.
Arceuthobium douglasii	Douglas-fir	Idaho, Montana	
Arceuthobium laricis	Western larch	Idaho, Montana	
Western gall rust *Endocronartium harknessii*	Lodgepole pine, ponderosa pine, Scotch pine	Idaho, Montana, North Dakota	This disease occurs frequently on pines, but it is usually not too severe on native species. In Idaho and North Dakota, the rust is damaging Scotch pine.
White pine blister rust *Cronartium ribicola*	Western white pine	Idaho, northwestern Montana	White pine blister rust losses have declined over the past few years as stands are regenerated with more resistant stock. A guide for managing white pine subject to blister rust infection is being compiled. Infection levels and prevalence of *Ribes* will be used to assess site hazards.

Northern Region—Status of diseases in Montana, northern Idaho, North Dakota, northwestern South Dakota, and National Park Service lands in northwestern Wyoming—Continued

Disease	Host	Location	Remarks
ROOT DISEASES			
Annosus root disease *Heterobasidion annosum*	Ponderosa pine, subalpine fir, western hemlock	Idaho, Montana	Root diseases are the most important long-term disease problems in the Northern Region's forests. They are management concerns on about 2 million acres in northern Idaho and 1 million acres in Montana. This acreage includes stands with disease centers and scattered mortality, and amounts to about 15 percent of Region's commercial forest land. Laminated root rot and armillaria root disease are commonly associated with Douglas-fir beetle on Douglas-fir and fir engraver on grand fir. They also kill seedlings and saplings growing near infected stumps. Black stain root disease and annosus root disease are found less frequently, but may be important causes of tree mortality. Red-brown butt rot causes indirect mortality by predisposing trees to windthrow and insect attack.
Armillaria root disease *Armillaria mellea*	Douglas-fir, other conifers	Idaho, Montana	
Black stain root disease *Ceratocystis wageneri*	Douglas-fir, lodgepole pine, ponderosa pine	Idaho, Montana	
Laminated root rot *Phellinus weirii*	Douglas-fir, grand fir, western redcedar, other conifers	Idaho, Montana	
Red-brown butt rot *Phaeolus schweinitzii*	Douglas-fir, other conifers	Idaho, Montana	
FOLIAGE DISEASES			
Larch needle blight *Hypodermella laricis*	Western larch	Idaho, Montana	Incidence of both needle disease has declined except in local areas, where discoloration occurred only in groups of trees on lower slopes.
Meria needle disease *Meria laricis*			
Miscellaneous needle cast diseases			
Elytroderma deformans	Ponderosa pine	Idaho, Montana	Incidence of these needle casts was widespread, but damage was relatively light.
Lophodermella concolor	Lodgepole pine	Idaho, Montana	
Rhabdocline pseudotsugae	Douglas-fir	Idaho, Montana	

Northern Region—Status of diseases in Montana, northern Idaho, North Dakota, northwestern South Dakota, and National Park Service lands in northwestern Wyoming—Continued

Disease	Host	Location	Remarks
Red band needle blight *Scirrhia pini*	Austrian pine, lodgepole pine, ponderosa pine	Idaho, Montana	Incidence was severe in many areas and is still evident around the Wilderness Gateway Campground, Clearwater National Forest, and in several small drainages north of Priest River, ID. Damage was evident on Austrian pine Christmas trees near Big Fork, MT.
Scotch pine needle cast *Naemacyclus niveus*	Scotch pine	Montana	This disease caused considerable damage in Scotch pine Christmas tree plantations near Big Fork.
Spruce needle blight *Lirula macrospora*	Colorado blue spruce, white spruce	North Dakota	This was the first report of needle blight in North Dakota. Some lower branch dieback has occurred on heavily infected trees. Infection is generally low but widespread.
Swiss needle cast *Phaeocryptopus gaeumannii*	Douglas-fir	Idaho, Montana	This needle cast has become a severe problem in Christmas tree culture. Defoliation was extensive throughout northern Idaho, and again this year, affected Montana's Christmas tree industry.
White pine needle cast *Lecanosticta acicola*	Western white pine	Idaho	Many white pine were defoliated near Bonners Ferry and Sandpoint.
VASCULAR WILTS			
Dutch elm disease *Ceratocystis ulmi*	American elm, Siberian elm	Montana, North Dakota	Dutch elm disease is still prevalent in Billings and Missoula, MT. The disease is increasing in North Dakota, especially near Devils Lake, Jamestown, and Minot.
NURSERY DISEASES			
Diplodia tip blight *Sphaeropsis sapinea*	Ponderosa pine	Idaho	Severe damage to 1-0 bareroot seedlings occurred in a private nursery near Peck and on similar seedlings at the Coeur d'Alene Nursery.

Northern Region—Status of diseases in Montana, northern Idaho, North Dakota, northwestern South Dakota, and National Park Service lands in northwestern Wyoming—Continued

Disease	Host	Location	Remarks
Fusarium root disease *Fusarium oxysporum* *Fusarium solani*	Douglas-fir, other conifers	Idaho, Montana	Fusarium root disease was common on both container-grown and bareroot seedlings at at the Coeur d'Alene Nursery. The disease caused extensive losses at the Bureau of Indian Affairs nursery in Ronan, MT, and at a private nursery in Kalispell, MT.
Gray mold *Botrytis cinerea*	Engelmann spruce, lodgepole pine, western larch	Idaho, Montana	Losses were evident in container-grown seedlings of western larch, lodgepole pine, and Engelmann spruce at the Coeur d'Alene Nursery. Gray mold also caused losses at several private nurseries in Montana.
Meria needle disease *Meria laricis*	Western larch	Idaho	At the Coeur d'Alene Nursery, this fungus was much less severe on bareroot seedlings in 1984 than it was in 1983.
Phoma blight *Phoma* spp.	Most conifers	Idaho	Tip blight associated with *Phoma* species occurred at several nurseries. Although the role of these fungi in disease initiation is unknown, their frequent association with diseased tissues indicates that they may be important.
Sirococcus tip blight *Sirococcus strobilinus*	Engelmann spruce, ponderosa pine	Idaho, Montana	Sirococcus tip blight continues to cause damage at a private nursery near Bonners Ferry, ID. The disease was also found on container-grown Engelmann spruce at the Coeur d'Alene Nursery and in several nurseries in Montana.
Storage mold Undetermined	Engelmann spruce	Montana	An unidentified fungus caused a black webbing on bareroot seedlings that were fall lifted and stored at ranger districts during the winter. Losses were significant and entire boxes of seedlings were discarded.

Northern Region—Status of diseases in Montana, northern Idaho, North Dakota, northwestern South Dakota, and National Park Service lands in northwestern Wyoming—Continued

Disease	Host	Location	Remarks
Western gall rust *Endocronartium harknessii*	Ponderosa pine	Montana	This rust was found on bareroot stock in several nurseries.
Winter damage	Conifers	Idaho	Tip and lateral branch necrosis and frost heaving were common in several nurseries during the spring. Also, damage was severe on 2-0 Douglas-fir at the Coeur d'Alene Nursery in late September, when an extreme cold period followed a mild late summer and early fall.
ABIOTIC			
Cold damage	Conifers, hardwoods	Idaho	Severe cold damaged introduced ornamentals, fruit trees, and conifers in northern Idaho.

Rocky Mountain Region—Insects

Rocky Mountain Region—Status of insects in Colorado, Kansas, Nebraska, South Dakota, and central and eastern Wyoming

Insect	Host	Location	Remarks
A cylindrical bark beetle *Chrysopogonius* sp.	Pinyon pine	Colorado	Specimens collected under root bark at Mesa Verde National Park were confirmed by the National Systematics Museum as a new species. More specimens will be collected.
Ash borer/lilac borer *Podosesia syringae*	Green ash, lilac	Nebraska, South Dakota	A major problem of ornamentals, moderate damage occurring, particularly in Omaha. Occurring primarily on young trees in South Dakota.
Cecropia moth *Hyalophora cecropia*	Cherry, plum	South Dakota	Increased defoliation reported in urban areas. Extent of damage undetermined.
Cerambycid wood borer complex	Various pines, hardwoods	Colorado, South Dakota	A nuisance to households. Several calls received regarding beetle emergence from firewood.
Cooley spruce gall aphid *Adelges cooleyi*	Blue spruce, Douglas-fir, Engelmann spruce	Colorado	Continues to be common on ornamentals.
Cottonwood twig gall aphid *Pemphigus* sp.	Cottonwood	Wyoming	Undetermined damage occurring. Aphid reported in Goshen County, WY.
Douglas-fir beetle *Dendroctonus pseudotsugae*	Douglas-fir	Colorado, Wyoming	Increased mortality continues in Colorado and Wyoming.
Douglas-fir tussock moth *Orgyia pseudotsugata*	Douglas-fir, spruce	Colorado, Wyoming	Light to moderate defoliation on ornamental spruce and in outlying forested areas along the Front Range. Defoliation increased over 1983 levels. Some defoliation also reported in central Wyoming.
Elm leaf beetle *Pyrrhalta luteola*	American elm, Siberian elm	Colorado, Nebraska, South Dakota	Chronic, moderate defoliation occurred on ornamentals. Beetle was also a nuisance in households.

Rocky Mountain Region—Status of insects in Colorado, Kansas, Nebraska, South Dakota, and central and eastern Wyoming—Continued

Insect	Host	Location	Remarks
Fall webworm *Hyphantria cunea*	Chokecherry, cottonwood, plum, wild rose	Colorado, Nebraska, South Dakota	Widespread in Colorado and Nebraska, primarily in drainages. Extent and trend undetermined. In South Dakota, populations continued to decline for the fourth year in a row.
Forest tent caterpillar *Malacosoma disstria*	Crab apple, green ash	Wyoming	Light defoliation reported scattered throughout the State.
Fruittree leafroller *Archips argyrospilus*	Boxelder, green ash	Wyoming	Light defoliation reported. Larvae were collected west of Douglas, WY.
Fungus gnat *Bradysia* spp.	Aspen	Colorado	Girdled and stripped roots of 50 percent of small experimental aspen container seedlings planted late in July.
Gray willow leaf beetle *Pyrrhalta decora decora*	Aspen	South Dakota	Heavy defoliation occurred on young aspen in small clearcut in Black Hills National Forest. No previous records of this insect in the area. Infestation trends will be monitored.
Gypsy moth *Lymantria dispar*	Hardwoods	Colorado, Kansas, Nebraska, South Dakota, Wyoming	Trapping projects continue in all five States. Three adults were caught in 1984 in Colorado and South Dakota. Adults suspected to have "hitchhiked" on vehicles from infested areas in the East.
Honeylocust podgall midge *Dasineura gleditschiae*	Honeylocust	Colorado, Wyoming	Static, light to moderate infestation continues in urban areas.
Jack pine budworm *Choristoneura pinus*	Jack pine	Nebraska	Light defoliation. Populations show no significant increase since treatment in 1980.
Large aspen tortrix *Choristoneura conflictana*	Aspen	Colorado	Light defoliation reported, primarily in southwest Colorado.

Rocky Mountain Region—Status of insects in Colorado, Kansas, Nebraska, South Dakota, and central and eastern Wyoming—Continued

Insect	Host	Location	Remarks
Mites (probably Bryobia sp.)	Ponderosa pine	Colorado	Thirty percent of 2-year-old container stock in a shadehouse exhibited extensive needle stippling and chlorosis due to feeding by red mites.
Mountain pine beetle Dendroctonus ponderosae	Limber pine, lodgepole pine, ponderosa pine	Colorado, South Dakota, Wyoming	Mortality remains widespread but has gone down this year. Mortality significantly reduced in ponderosa pine; static to increasing in lodgepole pine. Increases occurred in limber pine in Wyoming.
Peachtree borer Synanthedon exitiosa	Peach, plum	Colorado	Causing an undetermined amount of damage.
Pine budworm Choristoneura lambertiana	Ponderosa pine	Colorado	Light defoliation along the Front Range. Found with other defoliators in southern Colorado.
Pine butterfly Neophasia menapia	Ponderosa pine	Colorado	Outbreaks reported near Parker, CO. Moderate to heavy defoliation occurred in southern Colorado where pine butterfly and pine budworm infestations overlap.
Pine engraver beetles Ips spp.	All pines	Colorado, South Dakota	Common, particularly in areas near thinning operations. Increases occurred in southern part of the Black Hills National Forest.
Pine moths			
Dioryctria ponderosae Dioryctria tumicolella Dioryctria zimmermani	Austrian pine, ponderosa pine, Scotch pine	Colorado, Nebraska, South Dakota	Causing moderate defoliation primarily in young pine. Most severe in central and western Nebraska. D. zimmermani prominent in shelterbelts in South Dakota.
Dioryctria pseudotsugella	Douglas-fir	Wyoming	Common in budworm-infested areas on the Shoeshone National Forest. Once thought to be a budworm. Feeding apparently not not restricted to cones and cambium.

Rocky Mountain Region—Status of insects in Colorado, Kansas, Nebraska, South Dakota, and central and eastern Wyoming—Continued

Insect	Host	Location	Remarks
Pine needleminer *Coleotechnites ponderosae*	Ponderosa pine	Colorado, Wyoming	Static to decreasing along the Front Range. Most notable defoliation near the Big Thompson Canyon area of Colorado. Infestation was light in Wyoming.
Pine needle scale *Chionaspis pinifoliae*	Most pines	Colorado, Nebraska	Common in metropolitan areas and outlying forested areas in Colorado. Populations appear static in both Colorado and Nebraska.
Pine needle sheathminer *Zelleria haimbachi*	Ponderosa pine	Colorado	Undetermined damage near Pagosa Springs and north of Durango. Found with other defoliators in southern Colorado.
Pine tip moths			
Southwestern pine tip moth *Rhyacionia neomexicana*	Most pines	Colorado, Kansas, Nebraska, South Dakota, Wyoming	Reported near Casper, WY. Moderate damage also reported in young pine throughout Nebraska. Numbers continue to increase.
Pine tip moth *Rhyacionia* sp.			
Poplar-and-willow borer *Cryptorhynchus lapathi*	Poplars, willow cane	Wyoming	Larvae were reported in Evanston, WY. Damage undetermined.
Silver-spotted tiger moth *Halisidota argentata subalpina*	Juniper, pinyon	Colorado	Light defoliation spread over several thousand acres west of Colona. Other small outbreaks present near Durango.
Spider mites *Oligonychus* sp.	Spruce	South Dakota, Wyoming	Damage increased in South Dakota. Heavy infestations were reported near Newcastle, WY.

Rocky Mountain Region—Status of insects in Colorado, Kansas, Nebraska, South Dakota, and central and eastern Wyoming—Continued

Insect	Host	Location	Remarks
Spring cankerworm *Paleacrita vernata*	Ash, elm, hackberry, honeylocust	South Dakota	Since 1983, populations have collasped in the northeast corner of the State.
Spruce beetle *Dendroctonus rufipennis*	Spruce	Colorado, Wyoming	Spruce beetle-caused mortality has decreased. Mortality occurred over 1,400 acres on the Rio Grande National Forest. Prompt salvaging of damaged timber and unfavorable weather conditions are believed responsible. Infestations are static in Wyoming.
Spruce mycorrhizal aphid *Rhizomaria piceae*	Spruce	Colorado	Reported occurring in spruce containers at Colorado State University Nursery, Fort Collins, CO.
Twig beetle *Pityogenes carinulatus*	Ponderosa pine	Colorado	Moderate to heavy mortality occurred in stands heavily infested with dwarf mistletoe along the Poudre River in northern Colorado.
Twig girdler *Oncideres cingulata*	Red oak	Nebraska	Continues to cause light branch mortality.
Variable oakleaf caterpillar *Heterocampa manteo*	Bur oak	South Dakota	Populations have collapsed.
Western balsam bark beetle *Dryocoetes confusus*	Subalpine fir	Colorado	Scattered mortality common when beetle and vascular wilt disease occur together.
Western conifer seed bug *Leptoglossus occidentalis*	Pines	Colorado, Nebraska	Common on Scotch pine mainly in seed orchards. Degree of damage unknown.

Rocky Mountain Region—Status of insects in Colorado, Kansas, Nebraska, South Dakota, and central and eastern Wyoming—Continued

Insect	Host	Location	Remarks
Western spruce budworm *Choristoneura occidentalis*	Douglas-fir, Engelmann spruce, true firs	Colorado, Wyoming	Extensive areas of moderate defoliation continued to occur throughout central and northern parts of the Front Range. The most prominent, continuous defoliation, however, occurred on a 923,000-acre area in southern Colorado. Infestations in Wyoming have decreased to moderate or low levels. Most infestations occurred on the Wind River Indian Reservation.
Western tent caterpillar *Malacosoma californicum*	Aspen, bitterbrush, serviceberry	Colorado	Severe defoliation continued on aspen in southwest Colorado. Egg mass surveys indicate heavy defoliation in 1985. Large aspen tortrix populations are expected to increase and compound defoliation activity where the two insects overlap.

Rocky Mountain Region—Diseases

Rocky Mountain Region—Status of diseases in Colorado, Kansas, Nebraska, South Dakota, and central and eastern Wyoming

Disease	Host	Location	Remarks
STEM AND BRANCH DISEASES			
Comandra blister rust *Cronartium comandrae*	Lodgepole pine	Wyoming	A major problem on the Wind River Ranger District, Shoshone National Forest, where 30 percent of the basal area in the commercial forest is in lodgepole. And 50 percent of that total is damaged by the rust. Rust incidence in sampled stands varied from 11 to 50 percent.
Dwarf mistletoes *Arceuthobium americanum*	Lodgepole pine	Colorado, Wyoming	The most important problem on Federal lands in the Region. Found on about 518,000 acres in Colorado and 361,000 acres in eastern Wyoming, mistletoes cause mortality and growth loss equal to approximately 10 million cubic feet. Presuppression surveys were conducted on 11,550 acres on five National Forests. Silvicultural control was conducted on 5,220 acres.
Arceuthobium vaginatum subsp. *cryptopodum*	Ponderosa pine	Colorado	Approximately 20 percent of the host type is infested. Annual losses come to 885 million cubic feet.
Siberian elm canker *Botryodiplodia hypodermia*	Siberian elm	South Dakota	Continued to be a problem across the State.
Thyronectria canker *Thyronectria austro-americana*	Honeylocust	Colorado, Kansas	In Colorado, primarily a problem in urban areas. In western Kansas, it is a severe problem in windbreaks.
White pine blister rust *Cronartium ribicola*	Limber pine	Wyoming	Discovered within 15 miles of the Wyoming/Colorado State line in the Pole Mountains of the Medicine Bow National Forest.

Rocky Mountain Region—Status of diseases in Colorado, Kansas, Nebraska, South Dakota, and central and eastern Wyoming—Continued

Disease	Host	Location	Remarks
ROOT DISEASES			
Annosus root disease *Heterobasidion annosum*	Jack pine	Nebraska	Previously confirmed in a limited area of the Nebraska National Forest. New reports of declining pines suggest that the disease may be more widespread. Surveys are being planned to determine distribution.
Armillaria root disease *Armillaria mellea*	All conifers	Colorado, South Dakota, Wyoming	Remains the most prevalent root disease in the Region.
Black stain root disease *Ceratocystis wageneri*	Pinyon	Western Colorado	Trenching and chemical treatments in Mesa Verde National Park had limited success in preventing spread of the disease.
FOLIAGE DISEASES			
Anthracnose *Gloeosporium* spp.	Green ash, maple	South Dakota	Wet spring increased incidence on these species.
Gnomonia leptostyla	Walnut	East-central South Dakota	
Diplodia tip blight *Sphaeropsis sapinea*	Austrian pine, ponderosa pine	Nebraska, South Dakota	Branch dieback and tree mortality were common in windbreaks and urban areas in Nebraska. In the Black Hills, the disease appears to have stabilized.
Ink spot *Ciborinia whetzeli*	Aspen	Colorado	Continued to be a concern on the White River National Forest.
Juniper blight *Phomopsis juniperovora* *Cercospora sequoiae*	Eastern redcedar, Rocky Mountain juniper	Nebraska	Numerous reports of widespread light infections.
Marssonina blight *Marssonina populi*	Aspen, poplars	Colorado, Wyoming	Reports down compared to 1983.

Rocky Mountain Region—Status of diseases in Colorado, Kansas, Nebraska, South Dakota, and central and eastern Wyoming—Continued

Disease	Host	Location	Remarks
Needle cast probably *Lirula macrospora*	White spruce	South Dakota	Common on Christmas trees cut from the forest.
Shepherd's crook *Venturia tremulae*	Aspen	Colorado	Most of the incidence reported were on aspen sprouts.
Sydowia dothideoides	Aspen	Colorado	Also caused sprout mortality in areas with shepherd's crook disease.
VASCULAR WILTS			
Dutch elm disease *Ceratocystis ulmi*	Elm species, including American elm	Colorado, Nebraska, South Dakota	In Colorado, Dutch elm disease was down, except for Pueblo, Canon City, and LaJunta, where high tree mortality continued. In South Dakota, the disease is confirmed in all but five counties. In Nebraska, no change has been observed.
Verticillium wilt *Verticillium* sp.	Ginnala maples, green ash	Colorado	Observed in Fort Collins and Aurora.
NURSERY DISEASES			
Damping-off *Pythium* spp. *Fusarium* spp.	Conifers	Nebraska	Evaluation of soil solar heating for control of pathogens, nematodes, and weeds was completed at Bessey Nursery, Halsey. Although laboratory analysis showed a significant reduction in soil organisms, seedling survival in treated areas was no better than in untreated areas.
Nematode damage	Eastern redcedar	Nebraska	Some damage caused by *Pratylenchus penetrans* feeding appeared in late summer in limited pockets of 2-0 stock.
Storage mold *Cylindrocarpon didymum*	Ponderosa pine	Colorado	Approximately 15 percent of the container stock in a snow cache on the San Juan National Forest was destroyed.

Rocky Mountain Region—Status of diseases in Colorado, Kansas, Nebraska, South Dakota, and central and eastern Wyoming—Continued

Disease	Host	Location	Remarks
ABIOTIC			
Atmospheric deposition	All conifers	Colorado	No evidence supporting reports of damage around Gothic, CO. Interagency efforts are underway to determine if atmospheric deposition is affecting forest resources.
Flooding	All pines, Black Hills spruce, eastern redcedar, hardwoods	South Dakota	Heavy rains and high water tables resulted in many flooded areas. Trees in these locations showed symptoms of decline.
Herbicide drift	Conifers, hardwoods	South Dakota	Approximately 10 percent of all service calls to State Forestry pest specialists were related to herbicide damage.
Iron deficiency	Maples, pin oaks	South Dakota	Urban tree problem.
OTHER			
Decline	Hackberry	Nebraska	Continued to be a problem in urban areas, possibly caused by herbicide injury.
	Ponderosa pine	Colorado	No consensus on cause of the general decline of pine in the corridor from Pagosa Springs to Durango. Although pine budworm has been discovered, it is felt that a complex of factors are involved—rather than a single agent.
Winter drying and mortality	Maples, ponderosa pine, Russian olive, Scotch pine	South Dakota	In shelterbelts.
	Douglas-fir, juniper, lodgepole pine, pinyon, ponderosa pine, spruce	Colorado	The most spectacular disease problem this year. Classic examples of "red belt" exist along the Front Range from Magnolia south to Raton Pass. Browning observed west of Walsenburg to LaVeta Pass, on the north and south sides of Cucharas Pass, and in the St. Charles drainage.

Southwestern Region—Insects

Southwestern Region—Status of insects in Arizona and New Mexico

Insect	Host	Location	Remarks
Douglas-fir beetle *Dendroctonus pseudotsugae*	Douglas-fir	Arizona, New Mexico	Douglas-fir beetle activity increased slightly throughout the Region, causing mortality of scattered single trees and small groups. Tree mortality was most noticeable on the Carson and Santa Fe National Forests in areas severely defoliated by western spruce budworm for several consecutive years.
Large aspen tortrix *Choristoneura conflictana* Western tent caterpillar *Malacosoma californicum*	Aspen	Arizona, New Mexico	The large aspen tortrix and, to a lesser degree the western tent caterpillar, caused extensive defoliation throughout the aspen stands on the Carson, Santa Fe, and Lincoln National Forests in New Mexico. In Arizona, western tent caterpillar caused localized pockets of aspen defoliation along the North Rim of the Grand Canyon National Park.
Mountain pine beetle *Dendroctonus ponderosae*	Ponderosa pine	Arizona, New Mexico	This bark beetle remained at a low level, causing widely scattered mortality of single trees and small groups on the Kaibab, Carson, and Santa Fe National Forests. Fading ponderosa pines, resulting from mountain pine beetle attacks, were also detected within the Grand Canyon National Park, AZ, and on the Taos Pueblo and Santa Clara Indian Reservations, NM.
Pandora moth *Coloradia pandora*	Ponderosa pine	Arizona	This insect has a 2-year life cycle, so defoliation occurs every other year; no defoliation was observed in 1984. An egg mass survey conducted in October 1984 indicated that defoliation in 1985 will be considerably less than experienced in 1983. Small pockets of scattered defoliation may occur near Jacob Lake, AZ.

Southwestern Region—Status of insects in Arizona and New Mexico—Continued

Insect	Host	Location	Remarks
Pine engraver beetles *Ips* spp.	Pines	Arizona, Nex Mexico	*Ips*-caused mortality increased throughout the Region in 1984. The most noticeable increase was detected in Arizona on the Fort Apache and San Carlos Indian Reservations and the Kaibab, Prescott, and Tonto National Forests. Elsewhere in the Region, losses were minor.
Spruce beetle *Dendroctonus rufipennis*	Spruce	Arizona, New Mexico	Spruce beetle populations remained at outbreak levels in Arizona on the Fort Apache Indian Reservation and Apache-Sitgreaves National Forest, and in New Mexico on the Carson and Santa Fe National Forests. Although the number of trees killed declined in 1984, spruce mortality resulting from this bark beetle is expected to increase in 1985, particularly on the Fort Apache Indian Reservation.
True fir bark beetles Western balsam bark beetle *Dryocoetes confusus* *Scolytus* spp.	True firs	Arizona, New Mexico	Tree mortality resulting from these bark beetles was widely scattered throughout the Region. Mortality generally occurred in small groups of 1 to 10 trees and was often associated with root disease centers. Concentrated areas of true fir mortality of 50 or more trees were aerially detected on the Coconino National Forest, AZ, and Carson National Forest, NM.

Southwestern Region—Status of insects in Arizona and New Mexico—Continued

Insect	Host	Location	Remarks
Western spruce budworm *Choristoneura occidentalis*	Douglas-fir, spruce, true firs	Arizona, New Mexico	Western spruce budworm defoliation was aerially detected on 692,100 acres in 1984. In New Mexico, defoliation was widespread throughout most of the mixed conifer host type on the Carson, Santa Fe, Cibola, and Lincoln National Forests and on adjacent ownerships. Less extensive defoliation occurred in Arizona on the Kaibab National Forest and Grand Canyon National Park. An estimated 15,600 acres of mixed conifer were defoliated in Arizona and 676,500 in New Mexico. A loss assessment survey conducted on the Carson National Forest showed that mortality of trees with diameters of 5 inches or more ranged from 4 to 19 percent in areas with heavy and extremely heavy defoliation, respectively. Outbreaks will remain at high levels in 1985.

Southwestern Region—Diseases

Southwestern Region—Status of diseases in Arizona and New Mexico

Disease	Host	Location	Remarks
STEM AND BRANCH DISEASES			
Cone rust *Cronartium conigenum*	Chihuahua pine	Arizona	*Cronartium conigenum* was found damaging pine on the Douglas Ranger District, Coronado National Forest.
Dwarf mistletoes *Arceuthobium* spp.	Douglas-fir, Engelmann spruce, ponderosa pine	Arizona, New Mexico	Dwarf mistletoes caused significant growth and yield on commercial and noncommercial forest lands. Conifers on over 2.7 million acres of commercial forest land are infected; dwarf mistletoes caused an estimated loss of 25 million cubic feet of timber in Arizona and New Mexico in 1984.
False tinder fungus *Phellinus tremulae*	Aspen	Arizona, New Mexico	*Phellinus tremulae* is responsible for the most common cull and defect in aspen. This white trunk rot, widespread throughout the the host type, causes significant losses, especially in mature stands. Cull volumes may equal as much as 50 to 60 percent of the total volume.
Fir broom rust *Melampsorella caryophyllacearum*	True firs	Arizona, New Mexico	Fir broom rust is widely distributed in subalpine, corkbark, and white firs, but causes little real damage. Bole infections in the Sandia Ski Area, Cibola National Forest, NM, were responsible for some top breakage.
Indian paint fungus *Echinodontium tinctorium*	Spruce, true firs	Arizona New Mexico	Indian paint fungus is scattered in mature and overmature trees. Although it is indigenous, the fungus causes insignificant losses in mixed conifers.
Juniper rust *Gymnosporangium nelsonii*	Utah juniper	Arizona	Increased levels of infection were reported on the Kaibab Plateau, North Kaibab Ranger District, Kaibab National Forest.

Southwestern Region—Status of diseases in Arizona and New Mexico—Continued

Disease	Host	Location	Remarks
Red ring rot *Phellinus pini*	Douglas-fir, ponderosa pine, spruce, true firs	Arizona, New Mexico	*Phellinus pini* is indigenous in mature and overmature stands of pine and mixed conifer. Scattered in distribution; losses and damage are minimal in most stands. It is also been found on immature pine and mixed conifers in suppressed conditions.
Spruce broom rust *Chrysomyxa arctostaphyli*	Spruce	Arizona, New Mexico	Spruce broom rust is scattered throughout the host type but is of little commercial significance.
Stem cankers *Ceratocystis fimbriata* *Hypoxylon mammatum* *Cenangium singulare* *Cryptosphaeria populina* *Cytospora chrysosperma*	Aspen	Arizona, New Mexico	Canker fungi caused significant reductions in vigor and yield of mature aspen stands, resulting in tree mortality from girdling cankers and in top breakage, cull, and degrading. In many stands, 30 percent or more of the stems are affected. Appreciable damage to vegetation was recently found at the Sandia Ski Area, Cibola National Forest, NM.
Twig dieback *Cenangium ferruginosum*	White fir	Arizona	Scattered incidence of twig dieback found on North Kaibab Ranger District, Kaibab National Forest.
ROOT DISEASES			
Annosus root disease *Heterobasidion annosum*	Douglas-fir, ponderosa pine, spruce, true firs	Arizona, New Mexico	In Arizona and New Mexico, root and butt rot pathogens are responsible for an approximate 10-percent reduction in growth and yield. Losses maybe as high as 25 percent in some seriously infected stands. *A. mellea* accounts for 80 percent of the damage and volume loss in conifers; other root pathogens are responsible for the remaining 20 percent. The Southwest loses an estimated 15 to 20 million board feet annually to root rot.
Armillaria root disease *Armillaria mellea*	Douglas-fir, ponderosa pine, true firs	Arizona, New Mexico	
Inonotus tomentosus	Ponderosa pine spruce	Arizona, New Mexico	
Red-brown butt rot *Phaeolus schweinitzii*	Douglas-fir, true firs	Arizona, New Mexico	

Southwestern Region—Status of diseases in Arizona and New Mexico—Continued

Disease	Host	Location	Remarks
Ganoderma applanatum	Aspen	Arizona, New Mexico	Scattered throughout the host type, the fungus causes windthrow and standing cull.
Black stain root disease Ceratocystis wageneri	Pinyon pine, ponderosa pine	Arizona, New Mexico	Black stain root disease is very scattered the Southwest. Losses are insignificant in commercial timber.
FOLIAGE DISEASES			
Elytroderma disease Elytroderma deformans	Pinyon pine, ponderosa pine	Arizona, New Mexico	Infection and damage caused by needle cast and leaf diseases remained at endemic levels. Nor did the incidence increase appreciable. Elytroderma needle cast was reported to be widely distributed, but at low levels, on the Coconino and Kaibab National Forests, AZ.
Marssonina blight Marssonina populi	Aspen	Arizona, New Mexico	
Melampsora rust Melampsora medusae	Aspen	Arizona	
Shepherd's Crook Venturia tremulae	Aspen	Arizona, New Mexico	
ABIOTIC			
Red belt	Conifers	New Mexico	An extensive swath of "red belt" was reported throughout New Mexico, including the Carson, Cibola, Lincoln, and Santa Fe National Forests. Heavy needle damage was substained, but mortality should be limited and insignificant.

Intermountain Region—Insects

Intermountain Region—Status of insects in southern Idaho, Nevada, Utah, and western Wyoming

Insect	Host	Location	Remarks
Douglas-fir beetle *Dendroctonus pseudotsugae*	Douglas-fir	Idaho, Utah, Wyoming	Group killing of Douglas-fir occurred on the Bridger-Teton, Boise, and Payette National Forests. Activity generally increased: 3,720 trees were killed in 1984.
Douglas-fir tussock moth *Orgyia pseudotsugata*	Douglas-fir	Idaho	No current defoliation observed, but tree mortality resulting from previous defoliation noted.
Larch casebearer *Coleophora laricella*	Western larch	Idaho	Noted infrequently in 1984.
Mountain pine beetle *Dendroctonus ponderosae*	Lodgepole pine, ponderosa pine, other pines	Idaho, Utah, Wyoming	Mountain pine beetle killed about 3.3 million trees in 1984. Populations increased on the Boise, Bridger-Teton, Sawtooth, and Targhee National Forests. Epidemic continues to cause extensive mortality on the Ashley and Wasatch National Forests in northeastern Utah.
Pine butterfly *Neophasia menapia*	Ponderosa pine	Idaho	Light to moderate defoliation on over 2,800 acres on the Boise National Forest. Populations are declining.
Pine engraver beetle *Ips pini*	Pines	Idaho	A slight decrease in activity was noted. Fewer than 1,000 trees were killed on the Boise, Payette, and Salmon National Forests.
Pine needle sheathminer *Zelleria haimbachi*	Lodgepole pine	Idaho	New infestations of this insect, along with the sugar pine tortrix, were noted defoliating lodgepole pine on over 60,000 acres of the Targhee National Forest in southeastern Idaho.
Spruce beetle *Dendroctonus rufipennis*	Engelmann spruce	Idaho, Utah	Localized infestations continue to cause minimal mortality; 328 trees were killed on the Bridger-Teton, Fishlake, Manti-LaSal, Payette, and Uinta National Forests.

Intermountain Region—Status of insects in southern Idaho, Nevada, Utah, and western Wyoming—Continued

Insect	Host	Location	Remarks
Sugar pine tortrix *Choristoneura lambertiana*	Pines	Idaho	This insect, along with the pine needle sheathminer, defoliated lodgepole pine on 60,000 acres of the Targhee National Forest in southeastern Idaho.
Western pine beetle *Dendroctonus brevicomis*	Ponderosa pine	Idaho, Nevada	Very few trees were killed by this insect.
Western pine shoot borer *Eucosma sonomana*	Ponderosa pine	Idaho	Scattered infestations were noted throughout southern Idaho.
Western spruce budworm *Choristoneura occidentalis*	Douglas-fir, spruce, true firs, western larch	Idaho, Utah, Wyoming	Conifers on about 2.4 million acres were defoliated in 1984. Infestations expanded on the Dixie, Fishlake, Manti-LaSal, and Sawtooth National Forests. But defoliation declined on the Boise, Bridger-Teton, Challis, Payette, Salmon, Targhee, and Wasatch-Cache National Forests.
Western tussock moth *Orgyia vetusta gulosa*	Willows, *Ceanothus*	Idaho	Activity was insignificant in 1984.

Intermountain Region—Diseases

Intermountain Region—Status of diseases in southern Idaho, Nevada, Utah, and western Wyoming

Disease	Host	Location	Remarks
STEM AND BRANCH DISEASES			
Comandra blister rust *Cronartium comandrae*	Lodgepole pine, ponderosa pine	Idaho, Utah, Wyoming	Causes topkill of lodgepole pine in southeastern Idaho, northern Utah, and western Wyoming. Infections were detected on ponderosa pine regeneration in the Payette National Forest.
Cytospora canker *Cytospora chrysosperma*	Aspen	Idaho, Utah, Wyoming	Common on aspen. Causes mortality of branches, main stems, and entire trees, particularly those previously infected with marssonina blight.
Dasyscypha canker *Dasyscypha* sp.	Lodgepole pine, ponderosa pine	Idaho	Scattered incidence in southern Idaho on sapling-sized pine, particularly those damaged by snow.
Dwarf mistletoes *Arceuthobium* spp.	Douglas-fir, Jeffrey pine, lodgepole pine, ponderosa pine, western larch	Idaho, Nevada, Utah, Wyoming	Continued to be the most widespread and frequently observed pests in the Intermountain Region. Suppression projects removed infected overstory trees from 4,637 acres on ten National Forests.
False tinder fungus *Phellinus tremulae*	Aspen	Idaho, Nevada, Utah, Wyoming	Decay is prevalent on the Sawtooth National Forest; also detected in most aspen stands throughout the Region.
Indian paint fungus *Echinodontium tinctorium*	Grand fir, white fir	Idaho, Nevada	Common in old growth stands of true firs.
Limb rust *Peridermium filamentosum*	Ponderosa pine	Utah	High infection frequency was noted in stands on the Dixie National Forest.
Red ring rot *Phellinus pini*	Douglas-fir, pines, spruce, true firs, western larch	Idaho, Utah, Wyoming	In Idaho, usually found in butts and stems of infected hosts. Found on spruce in southern Utah and on lodgepole pine in western Wyoming.

Intermountain Region—Status of diseases in southern Idaho, Nevada, Utah, and western Wyoming—Continued

Disease	Host	Location	Remarks
Stalactiform rust *Cronartium coleosporioides*	Lodgepole pine	Idaho, Utah, Wyoming	Occasional localized occurrence throughout the host type in southern Idaho, northern Utah, and western Wyoming.
Western gall rust *Endocronartium harknessii*	Lodgepole pine, ponderosa pine	Idaho, Utah, Wyoming	Occurs throughout host types. Incidence varies from very light to very heavy.
ROOT DISEASES			
Annosus root disease *Heterobasidion annosum*	Douglas-fir, lodgepole pine, ponderosa pine, true firs	Idaho, Nevada, Utah, Wyoming	Detection of annosus root disease increased throughout the Region. Infection often results in mortality of young pines and Douglas-fir and in butt rot of true firs.
Armillaria root disease *Armillaria mellea*	Douglas-fir, grand fir, lodgepole pine, ponderosa pine	Idaho, Utah, Wyoming	Identified killing ponderosa pine saplings on the Boise National Forest. Also found on roots of mountain pine beetle-killed lodgepole pine on the Wasatch and Bridger-Teton National Forests.
Inonotus tomentosus	Douglas-fir, spruce, subalpine fir	Idaho, Utah	Decay is often found in southern Idaho, frequently in conjuction with red-brown butt rot in windthrown Douglas-fir. It was associated with decline and windthrow of subalpine fir on the Dubois Ranger District, Targhee National Forest. On blue and Engelmann spruce in the Dixie National Forest, the disease causes group mortality and windthrow.
Red-brown butt rot *Phaeolus schweinitzii*	Douglas-fir, ponderosa pine	Idaho	Decay is common throughout forests of southern Idaho, especially in trees over 200 years old. This fungus is often found associated with other root pathogens and bark beetles.

Intermountain Region—Status of diseases in southern Idaho, Nevada, Utah, and western Wyoming—Continued

Disease	Host	Location	Remarks
FOLIAGE DISEASES			
Dothistroma needle blight *Dothistroma pini*	Ponderosa pine	Idaho	Noted in only one area in southern Idaho: the confluence of the Middle Fork Weiser River and Lightning Creek.
Elytroderma disease *Elytroderma deformans*	Ponderosa pine	Idaho	Occurs where host is found in southwestern Idaho. High levels of infection were noted on the Boise National Forest east of the Crawford Guard Station on the Cascade Ranger District and along Manhattan Creek on the Idaho City Ranger District.
Fir broom rust *Melampsorella caryophyllacearum*	Subalpine fir	Idaho, Utah, Wyoming	Infections occur scattered throughout the host type. Very high infection levels occur in some areas, including the Cassia Division of the Sawtooth National Forest.
Lodgepole pine needle cast *Lophodermella concolor*	Lodgepole pine	Idaho	Moderate to heavy infection was noted around Stanley on the Sawtooth National Recreation Area and on the Challis National Forest. Infection was incidental elsewhere.
Marssonina blight *Marssonina populi*	Aspen	Idaho, Utah, Wyoming	Scattered incidence of light to moderate intensity was noted throughout host type, but some clones in Utah were heavily defoliated.
Meria needle disease *Meria laricis*	Western larch	Idaho	Incidence and severity of infection on the Boise and Payette National Forests appear to be increasing after several years of very low levels. The most notable occurrence was in pole-sized stands on the east face of West Mountain (Cascade Ranger District, Boise National Forest), where a combination of factors, including frost, budworm, and meria needle disease, caused severe foliage discoloration.

Intermountain Region—Status of diseases in southern Idaho, Nevada, Utah, and western Wyoming—Continued

Disease	Host	Location	Remarks
Needle rust of fir *Pucciniastrum* spp.	True firs	Idaho	Infection remained at light levels on firs in southwestern Idaho.
Needle rust of pine *Coleosporium asterum*	Lodgepole pine	Idaho	Occasional infections were noted throughout the host type.
Needle rust of pinyon pine *Coleosporium crowellii*	Pinyon pine	Nevada	Pinyon pine severely infected by this pest was observed in House Canyon on the Toiyabe National Forest.
Rhabdocline needle blight *Rhabdocline pseudotsugae*	Douglas-fir	Idaho	Moderate to severe infection levels on the Weiser, New Meadows, and McCall Ranger Districts, Payette National Forest. Endemic elsewhere in southern Idaho.
Spruce broom rust *Chrysomyxa arctostaphyli*	Engelmann spruce	Idaho, Utah, Wyoming	Scattered throughout host type.
Subalpine fir needle cast *Lirula* sp.	Subalpine fir	Idaho	Pockets of infected trees scattered along the North Fork of the Payette River, Payette National Forest.
VASCULAR WILTS			
Dutch elm disease *Ceratocystis ulmi*	American elm	Idaho, Utah	Increased infection and subsequent mortality detected in and around Boise, ID. Forty-two infected trees died.
ABIOTIC			
Hail damage	Lodgepole pine, subalpine fir	Idaho	Over 7,300 acres of branch flagging resulted from an early August hail storm in the Fenster Creek area northwest of Salmon.

Pacific Southwest Region—Insects

Pacific Southwest Region—Status of insects in California, Hawaii, Guam, and the Commonwealth of the Northern Mariana Islands

Insect	Host	Location	Remarks
A midge	Cypress, hemlock, juniper	Hawaii: island of Maui	This new introduction was first found in Hawaii in 1984. This particular midge has not been described in the United States.
A western spruce budworm *Choristoneura carnana californica*	Douglas-fir	Northern California	The infestation in Trinity and Shasta Counties increased to 130,000 acres: 21 percent light defoliation; 17 percent moderate; and 61 percent heavy defoliation. Egg masses were counted at 11/ square meter of foliage—up somewhat from 1983, but well below 1982 counts. Egg mass ratios indicate an insect population that has stabilized in the outbreak phase over most of the infested area. Parasites and predators have become abundant.
Black pineleaf scale *Nuculaspis californica*	Pines	Northern California	During the spring, about 1,800 acres of ponderosa pine near Burney remained infested. The private holdings within the area were aerially sprayed with carbaryl in July; results are unknown. Fall sampling and observations indicate that the outbreak on National Forest lands has collapsed.
Chinese rose beetle *Adoretus sinicus*	Arboretum trees	Guam	Defoliation noted in an arboretum.

Pacific Southwest Region—Status of insects in California, Hawaii, Guam, and the Commonwealth of the Northern Mariana Islands—Continued

Insect	Host	Location	Remarks
Douglas-fir tussock moth *Orgyia pseudotsugata*	White fir	Central and northern California	Results of larval and pheromone trap surveys indicate that tussock moth populations are increasing and have the potential to cause noticeable defoliation in 1985 or 1986. Larval sampling in June showed densities of about 4 larvae/1,000 square inches of foliage in several areas on the Eldorado and Stanislaus National Forests. Very light defoliation was observed in these and several other areas throughout the Sierra. The 1984 pheromone detection survey had the highest average trap catches since 1979, the first year of the survey. This year, 40 percent of the plots averaged 20 or more moths/trap and of those, 15 averaged 40 or more. Most of the plots with high trap catches were located on the Tahoe, Eldorado, and Stanislaus National Forests.
Eurasian pine aphid *Pineus pini*	Pines	Hawaii	The population remains low due to the chamaeyiid predator, *Leucopis obscura* Hal., which was released in 1976.
Fir engraver *Scolytus ventralis*	Firs	California	Generally low levels throughout the State.
Fruit piercing moth *Othreis fullonia*	Citrus, guava	Guam, Northern Mariana Islands	Severe damage to guava fruits on trees in the Plant Industry Division's nurseries in Guam and Saipan and to citrus fruits in Rota and Saipan.

Pacific Southwest Region—Status of insects in California, Hawaii, Guam, and the Commonwealth of the Northern Mariana Islands—Continued

Insect	Host	Location	Remarks
Fruittree leafroller *Archips argyrospilus*	California black oak, other hardwoods	Southern California	Light to moderate defoliation was observed on the Arrowhead Ranger District, San Bernardino National Forest. Defoliation occurred over about 20,000 acres, an increase of 5,000 acres over 1983. But its intensity was greatly reduced compared with last year's. Several nights of subfreezing temperatures coincided with egg hatch, bud break, and the onset of leaf expansion and may have caused some direct and/or indirect larval mortality. About 100 acres were also defoliated near Camp Nelson on the Sequoia National Forest.
Grasshoppers and crickets	Pines, firs, hardwoods	Northern California	Large populations of several species were present, including *Melanoplus devastator*, *Camnula pellucida*, *Centophilus californianus*, and the spur-throated and band-winged grasshoppers. Mild weather in the spring may have favored survival. Damage was observed on rust-resistant sugar pines in Sequoia National Park; conifers, oaks, and brush in the American Hill area; and ponderosa pine plantations on the Stanislaus and Six Rivers National Forests.
Greenhouse thrips *Heliothrips haemorrhoidalis*	Monterey pine	Hawaii: islands of Kauai and Maui	Needles were damaged in Christmas tree plantations.
Gypsy moth *Lymantria dispar*	Hardwoods, ornamentals	California	During 1984, 25 male gypsy moths were trapped in nine counties; two properties were found to have egg masses. These figures compare with 176 male moths trapped in 15 counties during 1983. The California Department of Food and Agriculture treated 5 locations during 1984 to eradicate gypsy moth; 10 sites were treated during 1983.

Pacific Southwest Region—Status of insects in California, Hawaii, Guam, and the Commonwealth of the Northern Mariana Islands—Continued

Insect	Host	Location	Remarks
Hibiscus mealybug *Maconellicoccus hirsutus*	Hibiscus	Hawaii: island of Oahu	This new introduction was first found in Hawaii in 1983 and remains a threat to native malvaceae.
Jeffrey pine beetle *Dendroctonus jeffreyi*	Jeffrey pine	California	In 1984, evaluation of the 165-acre suppression project in South Lake Tahoe identified 41 Jeffrey pines attacked by the pine beetle. In 1983, the beetle killed 145 Jeffrey pines; in 1982—the year the suppression project was begun—the beetle killed 330 trees. Considerable Jeffrey pine beetle-related mortality continues in other areas of South Lake Tahoe and Meyers, including Camp Richardson, Pope Beach, and south of Camp Richardson between Highway 89 and Tahoe Mountain. Silvicultural treatments designed to mitigate conditions predisposing Jeffrey pine to bark beetle attack are scheduled for 1985.
Jeffrey pine needleminer *Coleotechnites* sp.	Jeffrey pine	California	The infestation in San Bernardino County continued in 1984. For a number of years, about 3,000 acres have been infested in the Big Bear City-Lake Erwin and Snow Valley areas. Outbreaks were recorded in northern California for the first time. At Portola, in Plumas County, 5,200 acres of feeding injury were detected; near Susanville, in Lassen County, 1 acre was affected.
Jumping plant-lice *Heteropsylla* sp. possibly *incisa*	Leucaena	Hawaii	This new introduction was first found in Hawaii in 1984. It is a threat to plantings of leucaena.

Pacific Southwest Region—Status of insects in California, Hawaii, Guam, and the Commonwealth of the Northern Mariana Islands—Continued

Insect	Host	Location	Remarks
Lodgepole needleminer *Coleotechnites milleri*	Lodgepole pine	Yosemite National Park	After persisting for more than a decade, the outbreak in Yosemite National Park seems to be ending. Estimates of continued needleminer activity are placed at about 10,000 acres; down from 60,000 acres in 1983.
Melon fly *Dacus cucurbitae*	Avocado, citrus figs, mango	Northern Mariana Islands	Population increasing slowly since it was reintroduced into Rota from Guam in 1981.
Mexican leafroller *Amorbia emigratella*	Monterey pine	Hawaii: island of Hawaii	Needles were damaged in a Christmas tree plantation in West Hawaii.
Modoc budworm *Choristoneura retiniana*	White fir	Northeastern California	Slight to moderate defoliation occurred over some 50,000 acres in the Warner Mountains and the Manzanita area of Modoc County. Only very light to moderate defoliation is expected in 1985 in the same areas affected in 1984.
Mountain pine beetle *Dendroctonus ponderosae*	Sugar pine, ponderosa pine, lodgepole pine	Central and northern California	Ponderosa pines were killed in campgrounds in the South Warner Mountains. Elsewhere, the beetle was identified killing lodgepole pine at Parks Creek, Granite Creek, Huntington Lake, and Yosemite National Park. Sugar pines were killed at Nevada Point Ridge.
Pine needle sheathminer *Zelleria haimbachi*	Ponderosa pine	California	Defoliation was reported in several areas. Most defoliation occurred in pine plantations, where managers had made large investments to raise trees.

Pacific Southwest Region—Status of insects in California, Hawaii, Guam, and the Commonwealth of the Northern Mariana Islands—Continued

Insect	Host	Location	Remarks
Poinciana looper *Pericyma cruegeri*	Flame tree	Guam, Northern Mariana Islands	Activity continues at high levels on Rota. First reported in Guam in 1974, when it was seen defoliating a royal poinciana, or flame tree. It has since become an islandwide pest, leaving few trees untouched. The forest nursery has stopped propagating flame tree seedlings until effective chemical and/or biological controls have been established.
Spiraling whitefly *Aleurodicus dispersus*	Ornamentals, shade, and fruit trees; native and exotic forest trees	Guam, Northern Mariana Islands,	Appeared in Saipan and Rota in 1983 and increasing throughout the islands. Biological control agents also introduced in 1983. In Guam, prompt introduction of natural enemies has helped check spread.
Tangan tangan mealybug *Nipaecoccus vastator*	Tangan tangan; ornamentals, shade and fruit trees	Guam, Northern Mariana Islands	Population remains endemic on Saipan, Rota, and Tinian. No major outbreaks on Guam.
Tent caterpillar *Malacosoma* sp.	Bitterbrush, black oak	Northern and Eastern California	Rangeland tent caterpillar activity was widespread from Siskiyou and Mono Counties in the north to Tulare and Inyo Counties in the south. Heavy defoliation and some bitterbrush mortality occurred over 25,000 acres on the Modoc National Forest and some 1,000 acres on the Inyo National Forest. In Humboldt County, black oaks were defoliated over two 1,000-acre areas near Oak Grove Camp and Shower Mountain.
Western pine beetle *Dendroctonus brevicomis*	Coulter pine, ponderosa pine	California	In the Will Valley of southern California, Coulter pine were killed. In northern California, the western pine beetle caused ponderosa pine mortality at Calaveras Big Trees State Park, Caldor and Nevada Point Ridge, and Foresthill.

Pacific Southwest Region—Status of insects in California, Hawaii, Guam, and the Commonwealth of the Northern Mariana Islands—Continued

Insect	Host	Location	Remarks
Western yellowjacket *Vespula pensylvanica*	Pollinators and other insects; small forest animals; man	Hawaii	The population fluctuates greatly; populations in 1984 were higher than in 1983. This insect is a threat to pollinators, native insects, and other native animals.

Pacific Southwest Region—Diseases

Pacific Southwest Region—Status of diseases in California, Hawaii, Guam, and the Commonwealth of the Northern Mariana Islands

Disease	Host	Location	Remarks
STEM AND BRANCH DISEASES			
Dwarf mistletoes *Arceuthobium* spp.	Douglas-fir, pines, true firs	California	Dwarf mistletoes infect conifers on 2.2 million acres of commercial forest land in California and are associated with the deaths of some 312,500 trees annually.
Fir mistletoe *Phoradendron bolleanum*	White fir	Southern California	Infestations are severe in some white fir stands in National Forests in southern California.
True mistletoes *Phoradendron* spp.	Oaks, sycamores, cottonwoods; other native and introduced hardwoods	Central and southern California	Infection is widespread in high-use recreation areas; managers have pruned oaks on the Sequoia National Forest to attempt control of local infestations.
Western gall rust *Endocronartium harknessii*	Monterey pine	Hawaii: island of Kauai	First report of this disease in Hawaii. Only one sapling was infected.
White pine blister rust *Cronartium ribicola*	Sugar pine	Central and northern California	New infections were found at Challenge Experimental Forest and at Yosemite National Park; the disease continued to spread and intensify in the southern Sierra Nevada.
ROOT DISEASES			
Annosus root disease *Heterobasidion annosum*	Conifers	California	One of the principal root diseases of pines and true firs in California, annually destroying some 19 million cubic feet of timber. In recreation forests, annosus root disease has been associated with tree failures, property damage, and injury to forest visitors.
Black stain root disease *Ceratocystis wageneri*	Douglas-fir, pines	Central and northern California	New reports of the disease expanded its known range in the coastal mountains and throughout the Sierra Nevada.

Pacific Southwest Region—Status of diseases in California, Hawaii, Guam, and the Commonwealth of the Northern Mariana Islands—Continued

Disease	Host	Location	Remarks
Flame tree root disease *Phellinus noxius*	Flame tree	Guam, Northern Mariana Islands	Caused mortality in a few sites on Rota. Less host-specific and more scattered on Guam and Saipan.
Laminated root rot *Phellinus weirii*	Douglas-fir	Northern California	Its known range is confined to a few sites in Humboldt County.
Phytophthora root rot *Phytophthora lateralis*	Port-Orford-cedar	Northern California	Disease remains confined to the Smith River watershed.
FOLIAGE DISEASES			
Dothistroma needle blight *Dothistroma pini*	Monterey pine	Hawaii: islands of Kauai and Maui	Pines were affected in two Christmas tree plantations. This is a new introduction.
Elytroderma disease *Elytroderma deformans*	Ponderosa pine, Jeffrey pine	California	Widespread, but no increased incidence reported.
Needle casts of true fir *Lirula abietis-concoloris* *Virgella robusta*	White fir	Central and northern California	These needle cast fungi caused various levels of defoliation throughout the Sierra Nevada, in some cases affecting the value of Christmas trees.
VASCULAR WILTS			
Dutch elm disease *Ceratocystis ulmi*	Elms	Central California	1984 marked the tenth year of California's control effort. The disease has not moved out of the San Francisco Bay area; however, the number of diseased elms in this nine-County area was the second highest since the disease was discovered in 1975.

Pacific Southwest Region—Status of diseases in California, Hawaii, Guam, and the Commonwealth of the Northern Mariana Islands—Continued

Disease	Host	Location	Remarks
NURSERY DISEASES			
Fusarium oxysporum	Sugar pine	Northern California	Pathogen caused a hypocotyl rot in unshaded beds of sugar pine at the Placerville Nursery, but caused little loss elsewhere because of fall fumigation, early sowing, and shading of beds.
	Douglas-fir	Northern California	F. oxysporum predominated among several fungi isolated from stems of seedlings with top blight symptoms.
Phoma blight Phoma eupyrena	Douglas-fir, red fir	Northern California	At Humboldt Nursery, occurred at lower levels in 1984 than were recorded in 1982 or 1983. Redwood mulch and a shade cover reduced disease incidence.
Sirococcus tip blight Sirococcus strobilinus	Jeffrey pine, ponderosa pine	Northern California	Fungicide evaluation trials showed that several fungicides, when applied at 8-week intervals, control the disease.
ABIOTIC			
Air pollution	Jeffrey pine, ponderosa pine	Central and southern California	Slight to moderate ozone injury continues from southern California north to the Tahoe National Forest in the central Sierra Nevada.

Pacific Northwest Region—Insects

Pacific Northwest Region—Status of insects in Oregon and Washington

Insect	Host	Location	Remarks
Douglas-fir beetle *Dendroctonus pseudotsugae*	Douglas-fir	Oregon, Washington	East of the Cascades, Douglas-fir beetle damage was down. Levels are still far below what they were in the 1970's. The greatest damage occurred in the Snake River area of the Wallowa-Whitman National Forest. Losses in Douglas-fir east of the Cascades were 89.98 thousand cubic feet on 2,650 acres. West of the Cascades, losses increased; 2,255.14 thousand cubic feet of Douglas-fir was lost on 10,890 acres.
Fir engraver *Scolytus ventralis*	True firs	Oregon, Washington	A substantial decrease in fir engraver activity was noted in both States. Most of the fir engraver damage occurred on sites infected with either laminated root rot, armillaria root disease, or annosus root disease—diseases that weaken true firs making them susceptible to beetle attacks. Total losses were 79.54 thousand cubic feet on 4,080 acres.
Gypsy moth *Lymantria dispar*	Various hardwoods and conifers	Oregon, Washington	Adult trap catches declined in Washington from 1,307 in 1983 to 161 moths in 1984; eradication projects were conducted in Tacoma, Seattle, and Bellingham. In Oregon, traps caught 161 adults in 1983 and over 19,000 adults in 1984. Eradication projects were conducted in Gresham, Portland, and Salem. In forested areas of Lane County, egg mass searches revealed over 1,000 egg masses per acre.
Modoc budworm *Choristoneura retiniana*	Douglas-fir, true firs	Southern Oregon	Defoliation increased in true fir on the Fremont and Winema National Forests. Visible defoliation increased from 126,610 acres in 1983 to 483,630 acres in 1984. Results of the fall 1984 egg mass survey indicate continued defoliation in 1985.

Pacific Northwest Region—Status of insects in Oregon and Washington—Continued

Insect	Host	Location	Remarks
Mountain pine beetle *Dendroctonus ponderosae*	Lodgepole pine, ponderosa pine, white pine, other pines	Oregon, Washington	Losses continued about the same in Washington, but they have intensified in Oregon on the Deschutes, Fremont, and Winema National Forests. Losses on the Wallowa-Whitman, Malheur, and Umatilla National Forests continue to decrease, primarily because most of the suitable host trees have already been killed. In 1984, the losses included 46,607.24 thousand cubic feet of lodgepole pine on 1,249,790 acres; 2,149.66 thousand cubic feet of ponderosa pine on 88,880 acres; 925.36 thousand cubic feet of western white pine on 21,630 acres; and about 820 acres of various other pines. Intense losses are expected to continue in south-central Oregon and north-central Washington and to decrease elsewhere.
Pine engraver beetles *Ips* spp.	Ponderosa pine	Oregon, Washington	Activity of the pine engraver decreased significantly. Most of the activity was on the Ochoco National Forest. A total of 1,370 acres were affected.
Spruce beetle *Dendroctonus rufipennis*	Engelmann spruce	Washington	Spruce beetle activity in Engelmann spruce stands in northeast Washington was very low this year. Losses include 4.6 thousand cubic feet over 140 acres.
Western pine beetle *Dendroctonus brevicomis*	Ponderosa pine	Oregon, Washington	Tree mortality caused by the western pine beetle declined in Washington and Oregon. Greatest losses occurred on the Deschutes National Forest. 1984 losses totalled 780.6 thousand cubic feet.

Pacific Northwest Region—Status of insects in Oregon and Washington—Continued

Insect	Host	Location	Remarks
Western spruce budworm *Choristoneura occidentalis*	Douglas-fir, Engelmann spruce, true firs, western larch	Oregon, Washington	In the Pacific Northwest, the area of visible defoliation increased from 2,477,000 acres in 1983 to 3,096,650 acres. Budworm populations continue to increase in Oregon on the Malheur, Wallowa-Whitman, Mt. Hood, Deschutes, Ochoco, and Umatilla National Forests, on the Warm Springs Indian Reservation, and on intermingled State and private lands. In Washington, the size of the budworm infestation on the Okanogan National Forest and adjacent State and private lands increased in 1984, and new defoliation was discovered on the Wenatchee National forest. Results of the fall 1984 egg mass survey indicate continued defoliation in 1985.

Pacific Northwest Region—Diseases

Pacific Northwest Region—Status of diseases in Oregon and Washington

Disease	Host	Location	Remarks
STEM AND BRANCH DISEASES			
Dwarf mistletoes *Arceuthobium* spp.	Various conifers	Oregon, Washington	As stand management intensifies, losses attributed to this group of parasitic plants are declining. In 1984, dwarf mistletoes caused an estimated loss of 132 million cubic feet of timber. Handheld programmable calculators are being used to project reductions in yield and to perform economic analyses of stand management alternatives for dwarf mistletoe-infected stands of lodgepole pine in central Oregon.
Stem decay	Various conifers	Oregon, Washington	Stem decay fungi still consume enormous volumes of wood. Most losses occur in younger stands when wounding of residual trees during stand entries both activates dormant infections and creates infection courts. Programs for handheld calculators have been developed to estimate percentages of infection and decay in white and grand fir understories, two of the most defective species in the Region.
White pine blister rust *Cronartium ribicola*	Sugar pine, western white pine	Oregon, Washington	Annual losses of western white and sugar pines from blister rust in Oregon and Washington are estimated to be 15 million cubic feet. Additional training and followup on the use of handheld programmable calculator programs for predicting infection hazard occurred during 1984.
ROOT DISEASES	Various conifers	Oregon, Washington	Root diseases are among the most serious pest problems. The incidence of root disease is increasing, often in direct response to human activity. Annual losses to root diseases on all ownerships are estimated at about 130 million cubic feet.

Pacific Northwest Region—Status of diseases in Oregon and Washington—Continued

Disease	Host	Location	Remarks
Annosus root disease *Heterobasidion annosum*	Western hemlock, white fir	Oregon, Washington	This disease causes extensive losses in many partial-cut white fir stands in southern and eastern Oregon. Most losses are attributed to outright tree mortality. On the Fremont National Forest, the greatest amount of annosus root disease-related mortality—17 percent of all true firs—occurred in stands having multiple entries. Stands of true firs with one or no entries had only 6- or 2-percent mortality, respectively. In western hemlock stands, losses can be minimized by short, 100-year rotations and wound prevention.
Armillaria root disease *Armillaria mellea*	Various conifers	Oregon, Washington	The most serious losses occur east of the Cascades. Serious losses on the west side are usually confined to stressed stands, for example, off-site plantings. Direct control through stump and root removal is being practiced in severely infected stands in eastern Washington.
Black stain root disease *Ceratocystis wageneri*	Douglas-fir	Oregon, Washington	In southwestern Oregon, where black stain is the most commonly encountered disease in Douglas-fir plantations, the disease appears to be especially damaging if disturbances have occurred, especially to roadside Douglas-firs cut back by mechanical choppers. Because of the soil compaction, losses are also greater on tractor-logged than on cable-logged sites.

Pacific Northwest Region—Status of diseases in Oregon and Washington—Continued

Disease	Host	Location	Remarks
Laminated root rot *Phellinus weirii*	Douglas-fir, grand fir, white fir	Oregon, Washington	Laminated root rot is estimated to have removed about 5 percent of the Douglas-fir west of the Cascades from full production. The infested acreage, however, may be closer to 10 percent. Damage is also severe in some grand and white fir stands with true fir overstory. Laminated root rot killed 23 percent of the true fir in this kind of stand on the Ochoco National Forest in eastern Oregon.
Phytophthora root rot *Phytophthora lateralis*	Port-Orford-cedar	Southwestern Oregon	Phytophthora root rot continues to cause widespread mortality.
FOLIAGE DISEASES			
Dothistroma needle blight *Dothistroma pini* Elytroderma disease *Elytroderma deformans* Rhabdocline needle blight *Rhabdocline pseudotsugae*	Douglas-fir, lodgepole pine, ponderosa pine	Oregon, Washington	The incidence of several foliage diseases continued to increase during 1984. Thousands of acres of ponderosa and lodgepole pines east of the Cascades were affected by dothistroma needle blight. Elytroderma disease increased over most of the ponderosa pine. Rhabdocline needle blight affected Douglas-firs in central and southwestern Oregon.
NURSERY DISEASES			
Douglas-fir tip blight *Phoma* sp.	Douglas-fir	Oregon, Washington	Disease damaged up to 10 percent of 1-0 Douglas-fir crop in some nurseries. Fungicide applications appear to help.
Fusarium root disease *Fusarium oxysporum*	Various conifers	Oregon, Washington	In forest nurseries, scattered losses for most species; continued heavy mortality for sugar pines.
Meria needle disease *Meria laricis*	Western larch	Washington	Defoliation of entire 2-0 crop resulted in mortality and reduced growth.
Phytopthora root rot *Phytophthora* sp.	Douglas-fir, other conifers	Oregon, Washington	Transplant mortality high, particularly Douglas-fir. Seedling damage is confined primarily to low, poorly drained areas of nursery beds.

Southern Region—Insects

Southern Region—Status of insects in Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia; and Puerto Rico and the Virgin Islands

Insect	Host	Location	Remarks
A pine needle midge *Contarinia* n. sp.	Loblolly pine	Louisiana	Populations at very low levels and collapsed at Stuart Seed Orchard, Pollack.
Bagworm *Thyridopteryx ephemeraeformis*	Eastern redcedar, loblolly pine, Virginia pine, white pine	Alabama, Georgia, North Carolina, South Carolina	Moderate to heavy defoliation in urban areas.
Balsam woolly adelgid *Adelges piceae*	Fraser fir	North Carolina, Tennessee, Virginia	Continues to cause significant mortality throughout the range of Fraser fir in the southern Appalachians, except on Mt. Rogers, VA.
Blackheaded pine sawfly *Neodiprion excitans*	Loblolly pine, shortleaf pine	Alabama, Arkansas, Louisiana, Mississippi, Texas	Scattered, light defoliation occurred in all reporting States.
Black turpentine beetle *Dendroctonus terebrans*	Southern pines	Alabama, Arkansas, Louisiana, Mississippi, North Carolina, Texas	Mississippi was the only State to report losses exceeding 3 acres. Other States had low populations with extremely scattered mortality.
Coneworms			
Dioryctria amatella	Loblolly pine	Regionwide	Generally, less than 10 percent of cones were damaged.
Dioryctria clarioralis	Loblolly pine	Regionwide	Based on pheromone trap catches, Gulf Coast States had an increase. Central Southern States had a fivefold increase in the spring, but these populations collapsed in the fall. The northern tier of States had a threefold increase over 1983.
Dioryctria merkeli	Loblolly pine, slash pine	Regionwide	Pheromone trap catches indicated declining populations in the Gulf States; static populations in the center tier of States; and a small increase in the northern tier.

Southern Region—Status of insects in Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia; and Puerto Rico and the Virgin Islands—Continued

Insect	Host	Location	Remarks
Eastern tent caterpillar *Malacosoma americanum*	Black cherry, other Rosaceae	Alabama, Arkansas, Kentucky, North Carolina, South Carolina, Tennessee	High populations and widespread defoliation occurred.
Fall webworm *Hyphantria cunea*	Various hardwoods	Alabama, Arkansas, Georgia, Kentucky, North Carolina, South Carolina, Tennessee, Virginia	Populations continued to be higher than normal. Widespread defoliation reported in late summer.
Forest tent caterpillar *Malacosoma disstria*	Tupelo gum, other hardwoods	Alabama, Louisiana, South Carolina	Moderate to heavy defoliation of 300,000 acres in Louisiana. Light to moderate defoliation in Alabama. In South Carolina, the pest was a problem in the coastal area, causing moderate to heavy defoliation in some localized areas.
Fruittree leafroller *Archips argyrospilus*	Bald cypress	Louisiana	Extensive defoliation over 98,000 acres in Atchafalaya Basin.
Gypsy moth *Lymantria dispar*	Various hardwoods	North Carolina, South Carolina, Tennessee, Virginia	The northern tier of counties in Virginia are generally infested. Virginia experienced its first visible defoliation on approximately 1,400 acres on Short Hill Mountain: 30 acres were heavily defoliated; 374 acres were moderately defoliated; and the remaining 996 acres were lightly defoliated. Eradication projects were conducted against isolated infestations in all four States.
Introduced pine sawfly *Diprion similis*	Eastern white pine	North Carolina, Tennessee, Virginia	Populations remain at low levels, except in North Carolina where populations increased in 1984.

Southern Region—Status of insects in Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia; and Puerto Rico and the Virgin Islands—Continued

Insect	Host	Location	Remarks
Larch sawfly *Pristiphora erichsonii*	Larch	North Carolina	Larch sawflies were found on four isolated larch trees in 1982 in Buncombe County, NC. The population, while small, continued to damaged trees.
Loblolly pine sawfly *Neodiprion taedae linearis*	Southern pines	Mississippi, Virginia	Mississippi had three counties with 115,000 acres of moderate defoliation. Light defoliation was reported in Accomack County, VA.
Locust leafminer *Odontata dorsalis*	Black locust	North Carolina, Tennessee, Virginia	Scattered moderate to heavy defoliation.
Looper complex: Linden looper *Erannis tiliaria* Eastern oak looper *Phigalia titea* Fall cankerworm *Alsophila pometaria*	Oaks	Virginia	Over the State, populations have decreased. Only approximately 2,000 acres were defoliated.
Nantucket pine tip moth *Rhyacionia frustrana* Pitch pine tip moth *Rhyacionia rigidana*	Loblolly pine, shortleaf pine	Regionwide	High populations throughout Arkansas, particularily on shortleaf pine. Moderate populations occurred in other States.
Pine engraver beetles *Ips* spp.	Southern pines	Alabama, Arkansas, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Texas	Activity low in all States, although beetles were found associated with southern pine beetle outbreaks in Louisiana, South Carolina, and Texas.
Pine webworm *Tetralopha robustella*	Southern pines	Alabama, Arkansas	Scattered moderate defoliation in regenerated areas in Alabama and Arkansas.

Southern Region—Status of insects in Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia; and Puerto Rico and the Virgin Islands—Continued

Insect	Host	Location	Remarks
Redheaded pine sawfly *Neodiprion lecontei*	Southern pines	Alabama, Florida, Mississippi, Texas	Florida had low populations and no visible defoliation. There were 35 acres defoliated in one county in Mississippi, and light defoliation in regenerated areas in Alabama and Texas.
Reproduction weevils Pales weevil *Hylobius pales* Pitch-eating weevil *Pachylobius picivorus*	Southern pines	Alabama, Florida, Mississippi, North Carolina, Oklahoma, Texas	All States reported severe losses in some regenerated areas.
Scale insects *Toumeyella* sp. *Pseudophilippia quaintancii*	Southern pines	Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Texas, Virginia	All seed orchards using fenvalerate or permethrin as primary insecticide have had increased levels of scale damage. On the Beech Creek Orchard, 45 shortleaf pine died after a heavy infestation of striped pine scale in 1983-84. An additional 93 trees were weakened and are not expected to survive the winter.
Seedbugs *Leptoglossus corculus* *Tetyra bipunctata*	Southern pines	Arkansas Florida, Louisiana, Mississippi, North Carolina, South Carolina	Moderate populations caused scattered losses.
Slash pine thrips *Gnophothrips fuscus*	Slash pine	Alabama, Florida, Louisiana, Mississippi, Oklahoma, Texas	Minimal losses reported.

Southern Region—Status of insects in Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia; and Puerto Rico and the Virgin Islands—Continued

Insect	Host	Location	Remarks
Southern pine beetle *Dendroctonus frontalis*	Southern pines	Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, Oklahoma, South Carolina, Texas, Virginia	Fifty-nine counties in nine States reported outbreaks. Texas had over 4,800 spots. The National Forests in Texas had by far the worst outbreak with about 2,000 spots. Louisiana also had high levels of southern pine beetle. Alabama, Arkansas, Florida, Georgia, Mississippi, Oklahoma, South Carolina, and Virginia all reported low levels of activity. Approximately 28.3 million cubic feet was salvaged in the Southeast in 1984.
Texas leafcutting ant *Atta texana*	Southern pines	Louisiana, Texas	Serious losses of pine regeneration on deep, sandy soils.
Walnut caterpillar *Datana integerrima*	Black walnut, pecan, sweet pecan, water hickory	Alabama, Mississippi, North Carolina	Populations much reduced from those of 1983.
Webbing coneworm *Dioryctria disclusa*	Loblolly pine	Regionwide	Pheromone trap catches indicated that populations declined in the Gulf Coast States; increased slightly in the center tier of States; and declined slightly in the northern tier.
Whitemarked tussock moth *Orgyia leucostigma*	Laurel oak, live oak, southern red oak, water oak, various ornamentals	South Carolina	Causing scattered, localized problems along the coastal areas of South Carolina.
White pine aphid *Cinara strobi*	Eastern white pine	North Carolina, Virginia	Locally heavy populations causing top and branch dieback.

Southern Region—Diseases

Southern Region—Status of diseases in Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia; and Puerto Rico and the Virgin Islands

Disease	Host	Location	Remarks
STEM AND BRANCH DISEASES			
Canker rot *Inonotus hispidus* *Strumella coryneoidea*	Oaks	Georgia	High incidence has forced management changes in some forest stands.
Chestnut blight *Cryphonectria parasitica*	Native chestnuts, exotic chestnuts	Throughout host ranges	Damage continues, as do research efforts into hypovirulence.
Diplodia tip blight *Sphaeropsis sapinea*	Austrian pine	Oklahoma	Ornamentals and shelterbelts damaged.
Fusiform rust *Cronartium quercuum* f. sp. *fusiforme*	Loblolly pine, slash pine	Regionwide, except Tennessee and Kentucky	Continues as most serious disease of southern pines.
Hypoxylon canker *Hypoxylon atropunctatum*	Oaks	Regionwide	Common on stressed or weakened trees in low-quality forest sites and urban environments.
Nectria canker *Nectria* sp.	Black walnut	Tennessee	A walnut plantation had 50-percent canker incidence. Cankers will result in severe defects.
Pitch canker *Fusarium moniliforme* var. *subglutinans*	Southern pines, especially loblolly and slash pines	Alabama, Arkansas, Florida, North Carolina	Endemic in slash pine plantations in Florida and in loblolly pine plantations on peat soils in eastern North Carolina. Nursery infections of Virginia and slash pines resulted in outplanting mortality.
Shoot dieback *Sphaeropsis quercina*	Chestnut oaks, red oaks	North Carolina	Caused high incidence of forks and multiple leaders in young outplantings.
Slime flux *Erwinia* spp. and other bacteria	Oaks	North Carolina, South Carolina, Tennessee	Unusually high incidence in North Carolina urban trees; often associated with frost cracks.
Stem canker probably *Fusarium solani*	Teak	Puerto Rico, U.S. Virgin Islands	Ubiquitous distribution in plantations. Incidence averages 25 percent of the stems. Considerable lumber degrade results because termites infest the cankers.

Southern Region—Status of diseases in Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia; and Puerto Rico and the Virgin Islands—Continued

Disease	Host	Location	Remarks
Stem decay Basidiomycetes	All species, especially hardwoods	Regionwide	Continues as a problem in fire-damaged stands.
White pine blister rust *Cronartium ribicola*	Eastern white pine	North Carolina, Virginia	Sanitation inspections continue on proposed planting sites.
Witches broom Mycoplasmalike organisms	Mockernut hickory	Florida	New report in Florida.
ROOT DISEASES			
Annosus root disease *Heterobasidion annosum*	Southern pines, cedar	Regionwide	Annosus is the most serious root disease in the South. Damage reported in thinned stands in Alabama, Florida, and North Carolina. Early survey results show important incidence and impact in Florida. Urban occurrences also reported.
Littleleaf disease complex of site factors, *Phytophthora cinnamomi*, and *Pythium* spp.	Loblolly pine, shortleaf pine	Alabama, Georgia, Kentucky, North Carolina, South Carolina, Tennessee	Worst in Piedmont in natural stands growing on eroded, heavy clay soils. Surveys show considerable growth loss on 35-year-old, and older, loblolly pines growing on high-risk sites in South Carolina. Low incidence elsewhere throughout the South.
Root decay *Armillaria mellea* *Inonotus circinatus* *Phaeolus schweinitzii*	Most conifers, hardwoods	Regionwide	Common in forest stands and urban environments, especially where stresses are severe or trees overmature.
Root decline *Verticicladiella procera*	Eastern white pine, loblolly pine	Georgia, Mississippi, North Carolina	In North Carolina, disease may have caused top dieback in loblolly plantations. In Mississippi, also associated with annosus root disease in loblolly plantations. Losses continue in white pine stands in the southern Appalachians. Disease biology and impacts not well understood.

Southern Region—Status of diseases in Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia; and Puerto Rico and the Virgin Islands—Continued

Disease	Host	Location	Remarks
FOLIAGE DISEASES			
Anthracnose *Gnomonia* spp.	Hardwoods, especially ash, dogwood, maple, sycamore, and walnut	Regionwide	Premature defoliation and shoot dieback may result. Incidence high due to wet spring, but impact is low.
Brown spot *Scirrhia acicola*	Longleaf pine	Throughout host range	Severe locally; ectomycorrhizae and root application of benomyl reduce damage and improve survival of outplanted seedlings.
Needle casts of pine *Lophodermium* spp. *Ploicoderma* spp.	Pines	Regionwide	Widespread due to wet spring; but impact slight, except in Christmas tree plantings in South Carolina and Georgia.
Oak leaf blister *Taphrina caerulescens*	Oaks	Virginia	Incidence high because of wet spring.
Pine needle rust *Coleosporium* spp.	Pines	Regionwide	Premature needle cast may result; low impact.
VASCULAR WILTS			
Dutch elm disease *Ceratocystis ulmi*	Elms	Throughout host range	Reported on scattered urban trees in North Carolina and Louisiana.
Elm phloem necrosis (elm yellows) Mycoplasmalike organisms	Winged elm	Alabama	Scattered reports.
Mimosa wilt *Fusarium oxysporum* f. sp. *perniciosum*	Mimosa	Throughout host range	Urban trees killed.
Oak wilt *Ceratocystis fagacearum*	Oaks	Arkansas, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia	Active infection centers increased in Virginia. Texas epidemic continues in 32 counties. Texas red oak and live oak primary hosts there. Low incidence elsewhere.

Southern Region—Status of diseases in Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia; and Puerto Rico and the Virgin Islands—Continued

Disease	Host	Location	Remarks
Pinewood nematode *Bursaphelenchus xylophilus*	Scotch pine	Arkansas	Christmas trees and ornamentals affected in northwest part of the State.
Sycamore leaf scorch xylem-limited bacteria	Sycamore	Florida	First report in Florida. Unidentified group of bacteria related to Pierce's disease bacteria, which are found on grapes, causing leaf scorch on sycamore.
NURSERY DISEASES			
Anthracnose *Glomerella cingulata*	Yellow poplar	Mississippi	Loss of 44,000 seedlings in one nursery. Inoculum seedborne.
Chemical damage methyl bromide-chloropicrin	Loblolly pine	Georgia	Residual fumigant from incomplete container aeration may have contributed to germinating seedling mortality.
triadimefon	Loblolly pine, slash pine	Regionwide	Control of fusiform rust achieved, but negative effects on ectomycorrhizae (inoculated and natural) resulted in lower seedling quality in selected nurseries.
Cylindrocladium - Fusarium root rot complex: *Cylindrocladium* spp. *Fusarium* spp.	Eastern white pine, loblolly pine	Mississippi	In one nursery, 16 percent mortality of 2-0 white pine stock; 5 million loblolly culls in another nursery.
Damping-off *Fusarium* spp. *Phytophthora* spp. *Pythium* spp. *Rhizoctonia* spp.	Many conifers and hardwoods	Regionwide	Spotty, high incidence of postemergence damping-off in one South Carolina nursery reduced seedbed density below desired levels. Chronic losses elsewhere.

Southern Region—Status of diseases in Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia; and Puerto Rico and the Virgin Islands—Continued

Disease	Host	Location	Remarks
Environmental	Black walnut, loblolly pine, longleaf pine, sand pine, slash pine, sweetgum, Virginia pine	Alabama, Florida, Georgia, Mississippi	Damage to root cortex severe from Christmas freeze after an unseasonably warm fall and early winter.
Fusiform rust *Cronartium quercuum* f. sp. *fusiforme*	Loblolly pine, slash pine	Regionwide, especially on Gulf and Atlantic Coast	Good control with triadimefon achieved. Application problems in one Georgia nursery may have resulted in high incidence of rust.
Leaf spot *Cercosporella mori*	White mulberry	Texas	Increased culls resulted.
Phytophthora root rot *Phytophthora cinnamomi*	Loblolly pine	Texas	In one nursery, 3,000 seedling lost.
Rhizoctonia needle blight *Rhizoctonia* sp.	Eastern white pine, longleaf pine	Florida, Georgia, North Carolina, South Carolina	In South Carolina, killing 1-0 white pine stock after heavy sand splash during wet spring. Also, killed 325,000 longleaf pines in South Carolina.
Root disease complex: *Fusarium* spp. *Macrophomina phaseolina*	Loblolly pine	Alabama	Twenty-six percent incidence in one nursery.
Fusarium spp. *Verticillium* sp.	Black walnut, southern red oak	Louisiana	In one nursery, 4,000 seedlings lost.
Tip blight *Phoma* sp.	Loblolly pine	North Carolina, South Carolina	Forking and brushing resulted in 3 million culls in one nursery.
SEED ORCHARD DISEASES			
Pinewood nematode *Bursaphelenchus xylophilus*	Sand pine, slash pine	Florida	Killed about 20 trees in a sand pine orchard; incidental in a slash pine orchard.

Southern Region—Status of diseases in Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia; and Puerto Rico and the Virgin Islands—Continued

Disease	Host	Location	Remarks
Pitch canker *Fusarium moniliforme* var. *subglutinans*	Southern pines, especially slash pine and loblolly pine	Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina	Orchards have sustained sporadic damage that can be traced back to specific clones.
Root diseases *Armillaria mellea* *Armillaria tabescens* *Heterobasidion annosum* *Inonotus circinatus* *Verticicladiella procera*	Eastern white pine, shortleaf pine	Alabama, Louisiana, North Carolina, South Carolina	Low incidence, but chronic occurrence of symptoms and mortality in seed orchards.
Stem cankers *Cytospora* spp. *Sphaeropsis* spp. *Phoma* spp. *Fusarium solani*	Black cherry, oaks	North Carolina	In one orchard, canker incidence exacerbated by late frost and other site stresses.
ABIOTIC			
Air pollution ozone	Eastern white pine, other conifers	North Carolina, Virginia	Tip burn damage to Christmas trees in North Carolina and eastern Virginia counties.
Oak decline	Oaks, especially the red oak group and chestnut oak	Regionwide	Causes include drought, low site quality, and excessively long rotations. Large areas of mortality have heavily impacted forest management.
Spruce/fir mortality	Fraser fir, red spruce	North Carolina, Tennessee, Virginia	An aerial survey of southeastern alpine forests was initiated by the Forest Service to determine the status of tree mortality. The balsam woolly adelgid has been killing Fraser fir since it was introduced into that spruce/fir area more than 25 years ago. Recently, atmospheric deposition has been suggested as a possible contributing factor to reported spruce mortality and decline.

Southern Region—Status of diseases in Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia; and Puerto Rico and the Virgin Islands—Continued

Disease	Host	Location	Remarks
Storm damage	Live oak	Alabama	Old trees in most east and Gulf Coast cities are especially susceptible to top breakage and windthrow.
Tree decline	Many hardwoods and conifers	Regionwide	Recreation areas are hardest hit. Caused by soil compaction, vandalism to trees, and storm damage. Effects are chronic growth loss, crown dieback, and, eventually, death, especially in older age classes.
Tornado damage	All species	South Carolina	Heavy damage from widespread and frequent tornadoes during the spring.
Winter damage	Many species	Regionwide	Tree mortality, branch dieback, and stem injuries resulted from record December 1983 cold. Ornamentals planted outside their natural range are most severely affected.

Eastern Region and Northeastern Area—Insects

Eastern Region and Northeastern Area—Status of insects in Connecticut, Illinois, Indiana, Iowa, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, West Virginia, and Wisconsin

Insect	Host	Location	Remarks
Bruce spanworm *Operophtera bruceata*	American beech, poplar, sugar maple	Maine, New Hampshire, Vermont, Wisconsin	In northern Maine, 200,000 acres were defoliated, down 35 percent from 1983. The intensity of the infestation is also decreasing. In New Hampshire, the total area was about the same as last year—18,000 acres defoliated. Light to moderate defoliation occurred throughout northern Vermont. In northern Wisconsin, defoliation of maple and aspen is expected next year.
Fall cankerworm *Alsophila pometaria*	Hardwoods	Maine, Massachusetts, Michigan, New York, Pennsylvania, Rhode Island, West Virginia	In Maine, Rhode Island, and Martha's Vineyard, MA, populations were at low levels. About 5,000 acres in central New York were heavily defoliated. In Pennsylvania, several thousand acres were defoliated, and in association with the bruce spanworm and linden looper (*Erannis tiliaria*), over 50,000 acres were defoliated. Scattered defoliation occurred in West Virginia and Michigan.
Forest tent caterpillar *Malacosoma disstria*	Hardwoods	Maine, Michigan, Minnesota, New York, Vermont, Wisconsin	In Maine, the heavy populations that occurred in 1983 collapsed. In Vermont, tree mortality caused by the 1978–82 outbreak has increased. In one area of northern Vermont, over 10 percent of the trees are dead on 8,500 acres. In 1984, only 625 acres were defoliated in New York, but heavy defoliation during the 1980–82 outbreak has caused sugar maple mortality on 200,000 acres. In the Upper Peninsula of Michigan, light to moderate defoliation occurred on 48,000 acres. In Minnesota, only 33,000 acres were defoliated, compared to 168,000 acres in 1983. In Wisconsin, 95,000 acres were affected, down 65 percent from 1983.

Eastern Region and Northeastern Area—Status of insects in Connecticut, Illinois, Indiana, Iowa, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, West Virginia, and Wisconsin—Continued

Insect	Host	Location	Remarks
Gypsy moth *Lymantria dispar*	Oak, other hardwoods	Connecticut, Delaware, Indiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, West Virginia, Wisconsin	Areawide, about 1 million acres were moderately to heavily defoliated, compared to 2.4 million in 1983. Throughout New England, where 350,000 acres were defoliated, populations have been dropping dramatically since 1981. The only exception is southeastern Massachusetts and Rhode Island. There was no defoliation visible from the air in New Hampshire or Vermont. In New York, New Jersey, and Pennsylvania, the area defoliated decreased more than 65 percent from the area defoliated in 1983. In New York, losses from the 1980 to 1982 epidemic total 30 million board feet. In Delaware and Maryland, populations are building. In Michigan, there has been a dramatic increase in defoliation. Large-scale suppression projects were conducted in Delaware, Maryland, New Jersey, Pennsylvania, and West Virginia. Fewer moths have been caught areawide than during the 1980–82 epidemic.
Jack pine budworm *Choristoneura pinus*	Jack pine	Michigan, Minnesota, Wisconsin	In the Lower Peninsula of Michigan, over 600,000 acres were defoliated; however, population levels were 50 percent less than in 1983. In the Upper Peninsula, a rapidly building epidemic is expected over the next 2 to 4 years. This year, 7,000 acres were defoliated, compared to 470 acres in 1983. In Minnesota, where 200,000 acres were defoliated, the outbreak is expected to intensify. Populations are increasing in Wisconsin. Approximately 130,000 acres were defoliated, and mortality is expected to exceed 50,000 cords.

Eastern Region and Northeastern Area—Status of insects in Connecticut, Illinois, Indiana, Iowa, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, West Virginia, and Wisconsin—Continued

Insect	Host	Location	Remarks
Spruce budworm *Choristoneura fumiferana*	Balsam fir, spruce	Maine, Michigan, Minnesota, New Hampshire, Vermont, Wisconsin	Compared to 1983, populations were down in Maine, New Hampshire, and Vermont. Of 5.5 million acres affected in Maine, 1.9 million acres were moderately to heavily defoliated, compared to 4 million acres of moderate to heavy defoliation in 1983. Approximately 668,000 acres were treated with biological and chemical insecticides. Fir mortality exceeds 50 percent on over 300,000 acres; some areas have more than 25 percent dead spruce. In New Hampshire, only 930 acres were lightly defoliated. Approximately 49,000 acres have been salvage cut within the last 5 years. In Vermont, populations dropped to their lowest level in 10 years; only 170 acres were treated in 1984. In the Lake States, defoliation has increased dramatically. In Minnesota, the outbreak area increased 300 percent, and 361,600 acres were defoliated. Over 100,000 cords have been lost. This year, in Wisconsin, 22,050 acres were defoliated. The area affected is expected to increase next year. Almost 200,000 acres were defoliated in the Upper Peninsula of Michigan.

Eastern Region and Northeastern Area—Diseases

Eastern Region and Northeastern Area—Status of diseases in Connecticut, Illinois, Indiana, Iowa, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, West Virginia, and Wisconsin

Disease	Host	Location	Remarks
STEM AND BRANCH DISEASES			
Beech bark disease *Cryptococcus fagisuga*; *Nectria coccinea* var. *faginata*	American beech	New England, New Jersey, New York, Ohio, Pennsylvania, West Virginia	In New England, widespread mortality continues. The disease is spreading south and west: the leading edge of mortality is in northern New Jersey, central New York, and western Pennsylvania, where 10 to 15 percent of the trees are dead. Over 125,000 acres in West Virginia are scale infested; scattered mortality caused mostly by the fungus *Nectria galligena* occurs on 50,000 acres. Trace populations of the scale were reported for the first time in northeastern Ohio.
Diplodia tip blight *Sphaeropsis sapinea*	Austrian pine, jack pine, red pine, Scotch pine	Indiana, Iowa, Massachusetts, Minnesota, Missouri, Pennsylvania, Rhode Island, Wisconsin	The disease is scattered throughout northwest Wisconsin and northern Minnesota, and most plantations have less than 10-percent infection. The incidence of the disease has increased in Indiana and Missouri. Large Austrian pines have been heavily damaged. Throughout Iowa, the disease is found on ornamentals and windbreaks. Red pines on Martha's Vineyard are heavily infected. Diplodia is found throughout Pennsylvania, especially on red pine.
Eastern dwarf mistletoe *Arceuthobium pusillum*	Black spruce, white spruce	Maine, Michigan, Minnesota, Wisconsin	Eastern dwarf mistletoe is mainly a parasite on black spruce and, to a lesser extent, on white spruce, especially along the coast of Maine.
European larch canker *Lachnellula willkommii*	Larch	Maine	A new area of infection was found in the central coastal area of Maine. Previously, the disease was thought to be concentrated in Washington County, along the coast near the New Brunswick border. Twenty-nine infected townships are under quarantine. Canker aging indicates that the disease has been active since 1970.

Eastern Region and Northeastern Area—Status of diseases in Connecticut, Illinois, Indiana, Iowa, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, West Virginia, and Wisconsin—Continued

Disease	Host	Location	Remarks
Scleroderris canker *Gremmeniella abietina*	Jack pine, red pine, Scotch pine	Maine, Michigan, Minnesota, New Hampshire, New York, Vermont, Wisconsin	In New England and New York, where both North American and European strains are found, the total affected area has stabilized during the past few years. No new infection has been found in Maine since 1982 nor in New Hampshire since the original infestation was found in 1978. In northern New York, where the quarantine encompasses 13 counties, infection rates have been stable since 1981. In Vermont, however, some additional townships were added to the quarantine; these were the first new findings in the State since 1980. In the Lake States, where only the North American strain is found, there has been no significant spread or increase in severity during the past years.
VASCULAR WILTS			
Dutch elm disease *Ceratocystis ulmi*	Elm	Areawide	The disease continues to affect elms regionwide. Losses to urban areas have been high.
Oak wilt *Ceratocystis fagacearum*	Oak	Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, Pennsylvania, West Virginia, Wisconsin	In southwestern Pennsylvania, the incidence of the disease has been decreasing. In recent years, in Iowa, over 7,000 acres have become affected. The disease has also become widespread in Missouri. Approximately 5 percent of the oak trees in southeastern Minnesota are infected. The disease is present in the Upper Peninsula of Michigan along the Wisconsin border.

Eastern Region and Northeastern Area—Status of diseases in Connecticut, Illinois, Indiana, Iowa, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, West Virginia, and Wisconsin—Continued

Disease	Host	Location	Remarks
NURSERY DISEASES			
Diplodia tip blight *Sphaeropsis sapinea*	Jack pine, red pine	Minnesota, Wisconsin	At the Federal forest tree nursery in Minnesota, 1 million jack and red pine seedlings were killed. Infected red pine windbreaks at two Wisconsin State nurseries are being removed.
Pine-oak (eastern) gall rust *Cronartium quercuum*	Jack pine	Minnesota, Wisconsin	The disease is a continuing problem in Wisconsin State forest nurseries and, in Minnesota, the disease has caused 15-percent cull in jack pine.
ABIOTIC			
Weather-related injury	Various species	Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Vermont, Wisconsin	The most severe winter injury since 1978 occurred in Michigan, Minnesota, and Wisconsin during the winter of 1983-84. In Minnesota, ornamental hardwood losses exceeded $100,000; in Wisconsin 50 percent of the maples exhibited severe dieback. A warm period in February caused foliage desication in Michigan and Vermont. In Illinois and Missouri, sudden low temperatures caused mortality of loblolly pine. In Indiana and Iowa, conifers and hardwoods were affected by summer drought and winter kill. In Wisconsin, tornadoes caused 8,000 acres of blowdown.
OTHER			
Ash dieback and mortality	Ash	Indiana, Iowa, Vermont	In Vermont, substantial losses, especially of mature trees, have occurred in some areas. Over 50 percent of the ash in Indiana exhibit symptoms of decline. Affected trees in Iowa die quickly—within 2 or 3 years after symptoms appear.

Eastern Region and Northeastern Area—Status of diseases in Connecticut, Illinois, Indiana, Iowa, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, West Virginia, and Wisconsin—Continued

Disease	Host	Location	Remarks
Balsam fir mortality	Balsam fir	Maine, New Hampshire, New York	Balsam fir has been reported dying in narrow waves on mountainsides in the Adirondacks in New York, the White Mountains in New Hampshire, and on Mt. Katahdin in Maine. The waves, thought to be wind induced, are described as bands of standing dead trees with mature forests on one side and regenerating forest on the other, generally following the direction of the prevailing winds.
Birch dieback and mortality	Birch	Iowa, Maine, Minnesota, Vermont, Wisconsin	Increased mortality of paper birch in central Minnesota has been attributed to the drought of the mid-1970's coupled with the impact of fall defoliators. In Wisconsin, top kill of yellow birch, caused by frost and defoliation, is scattered over 30,000 acres. Dieback and mortality continue in Vermont, especially on well-drained soils. Mortality is increasing in eastern Maine, probably as a result of insect attack and soil conditions. Dieback and mortality of river birch is occurring in southeastern Iowa.
Larch mortality	Larch	Maine, New Hampshire, New York, Vermont	In New York, armillaria root disease and the eastern larch beetle, Dendroctonus simplex, have been found associated with dead and dying trees. In Maine, newly affected stands have been found. Little new mortality is occurring in Vermont. In New Hampshire, 61 percent of the larch on 1,500 acres is dead or dying, and beetle populations have been increasing for the past 10 years.

Eastern Region and Northeastern Area—Status of diseases in Connecticut, Illinois, Indiana, Iowa, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, West Virginia, and Wisconsin—Continued

Disease	Host	Location	Remarks
Maple dieback and mortality	Maple	Iowa, Michigan, New York, Pennsylvania, Vermont, Wisconsin	Mortality of maples is most evident in Vermont, especially in areas defoliated by the forest tent caterpillar. West of the Adirondacks in New York, maples on 60,000 forested acres are affected. In Pennsylvania, 3,500 acres are affected in areas previously defoliated by the canker-worm. In Michigan and Iowa, urban trees exhibit branch dieback caused by various diseases, insects, and environmental factors.
Oak dieback and mortality	Oak	Delaware, Illinois, Michigan, Minnesota, Missouri	In Minnesota, many oak trees have branch dieback because of the impact of fall defoliators, borers, armillaria root disease, and drought. Similar factors caused decline in Missouri, Illinois, and in the Upper Peninsula of Michigan. Dead and dying trees are found in almost every oak stand in Delaware.
Spruce mortality	Spruce	New Hampshire, New York, Vermont	In New York, mortality in red spruce in the Adirondacks has been increasing since the 1960's. In Vermont, increased mortality was observed on several mountains. The greatest mortality occurs on western slopes at about 3,500 feet. Mortality is continuing at the higher elevations in New Hampshire. Several factors appear to be involved, including overmaturity, exposed sites, root diseases, winter damage, and, in some areas, bark beetles.

Alaska Region—Insects

Alaska Region—Status of insects in Alaska

Insect	Host	Location	Remarks
Ambrosia beetle *Trypodendron lineatum*	Sitka spruce, western hemlock	Southeast and south-central Alaska	The striped ambrosia beetle caused substantial problems in various sort yards in southeast Alaska. Levels of damage were lower than those in 1983, largely because the timber harvest was smaller. Chemical treatment of infested Sitka spruce logs continued on Afognak Island.
A spruce budworm *Choristoneura orae*	White spruce	South-central Alaska	Defoliation levels fell dramatically in 1984. In 1985, however, defoliation is expected to increase in the Copper Center and Chitina areas. Defoliation was not observed in southeast Alaska.
Bud moth *Zeiraphera* sp.	Sitka spruce, white spruce	South-central and interior Alaska	Bud moth feeding on expanding buds and new growth was apparent throughout most of interior and south-central Alaska, including Kodiak and Afognak Islands. Defoliation levels are expected to remain high in 1985.
Cottonwood leaf beetle *Chrysomela walshi*	Black cottonwood, balsam poplar	South-central Alaska	Heavy defoliation noted along Turnagain Arm south of Anchorage.
Engraver beetle *Ips perturbatus*	White spruce	Interior Alaska	Populations remain at endemic levels; 85 acres were infested in 1984.
Hemlock sawfly *Neodiprion tsugae*	Western hemlock	Southeast Alaska	The hemlock sawfly was the most significant insect problem in southeast Alaska. It defoliated over 70,800 acres in 1984. Significant defoliation may occur again in 1985 if favorable weather conditions prevail.
Large aspen tortrix *Choristoneura conflictana*	Quaking aspen	South-central and interior Alaska	In south-central Alaska, tortrix activity decreased to low levels. However, defoliation continued on 20,340 acres of aspen near Big Delta in the interior. Defoliation is expected to decrease in 1985.

Alaska Region—Status of insects in Alaska—Continued

Insect	Host	Location	Remarks
Spearmarked black moth *Rheumaptera hastata*	Paper birch	Interior Alaska	For the second year, black moth populations increased near Fairbanks. The moth defoliated 307,089 acres of birch, a 72 percent increase over the 87,500 acres reported in 1983. Defoliated areas are expected to increase in 1985.
Spruce beetle *Dendroctonus rufipennis*	Sitka spruce, white spruce	South-central and Alaska Southeast	Infestations covered 416,789 acres in 1984, an increase of 21 percent over the 328,000 acres reported in 1983. White spruce mortality is occurring on 54,790 acres in the Chugach National Forest. Tree mortality has increased on the Kenai National Wildlife Refuge where the beetle infests 63,785 acres of white spruce. Spruce beetle populations in Glacier Bay National Park in southeast Alaska have expanded; 9,886 acres are now infested.
Spruce bud midge *Rhabdophaga swainei*	Black spruce, white spruce	South-central Alaska	Damage (bud killing and deformation) was prevalent on open-growth regeneration throughout the Kenai Peninsula. In many cases, the spruce have grown multiple leaders.
Spruce needle aphid *Elatobium abietinum*	Sitka spruce	Prince William Sound and southeast Alaska	A mild winter in 1983 led to larger populations in southeast Alaska. The aphid was an urban problem in Sitka, Ketchikan, and Juneau. Aphid defoliation in the Icy Bay area decreased 81 percent to 389 acres in 1984.
Western blackheaded budworm *Acleris gloverana*	Western hemlock	Prince William Sound	Defoliation decreased 40 percent. In 1984, 8,849 acres were reported between Cordova and Valdez. Budworm populations remain at endemic levels in southeast Alaska.

Alaska Region—Diseases

Alaska Region—Status of diseases in Alaska

Disease	Host	Location	Remarks
STEM AND BRANCH DISEASES			
Hemlock dwarf mistletoe *Arceuthobium tsugense*	Western hemlock	Southeast Alaska	Remains the most damaging tree disease in old-growth western hemlock in southeast Alaska. A high proportion of the old-growth hemlock stands between Haines and Portland Canal are infested.
FOLIAGE DISEASES			
Spruce needle rust *Chrysomyxa ledicola*	Sitka spruce, white spruce	Interior Alaska	Spruce needle rust was observed scattered throughout white spruce stands in the interior: 1,657 acres of spruce were infested. Needle rust was at endemic levels throughout the rest of Alaska.
OTHER			
Cedar mortality	Alaska-cedar	Southeast Alaska	To date, approximately 25,000 acres of scattered cedar mortality have been found. Areas of greatest mortality are on Kupreanof, Baranof, and Chichagof Islands. No evidence of dieback was found during an examination of stands in the northern-most range of Alaska-cedar located adjacent to Prince William Sound. The cause of the dieback is unknown.
Fluting	Western hemlock	Southeast Alaska	Fluting, or irregularly shaped tree boles, is common throughout western hemlock and seriously downgrades logs. Most fluting occurs within half a mile of the shoreline. Its cause is unknown.
Spruce mortality	White spruce	Interior Alaska	Aerial surveys detected 4,000 acres of scattered dead and dying white spruce near Circle. A ground check did not find any responsible pathogens or insects. The mortality is probably caused by increasing permafrost and high soil moisture that result in a slow decline and death.

Part 3. Index

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