United States
Department of
Agriculture

**Forest
Service**

# Forest Insect and Disease Conditions in the United States 1983

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May 1984

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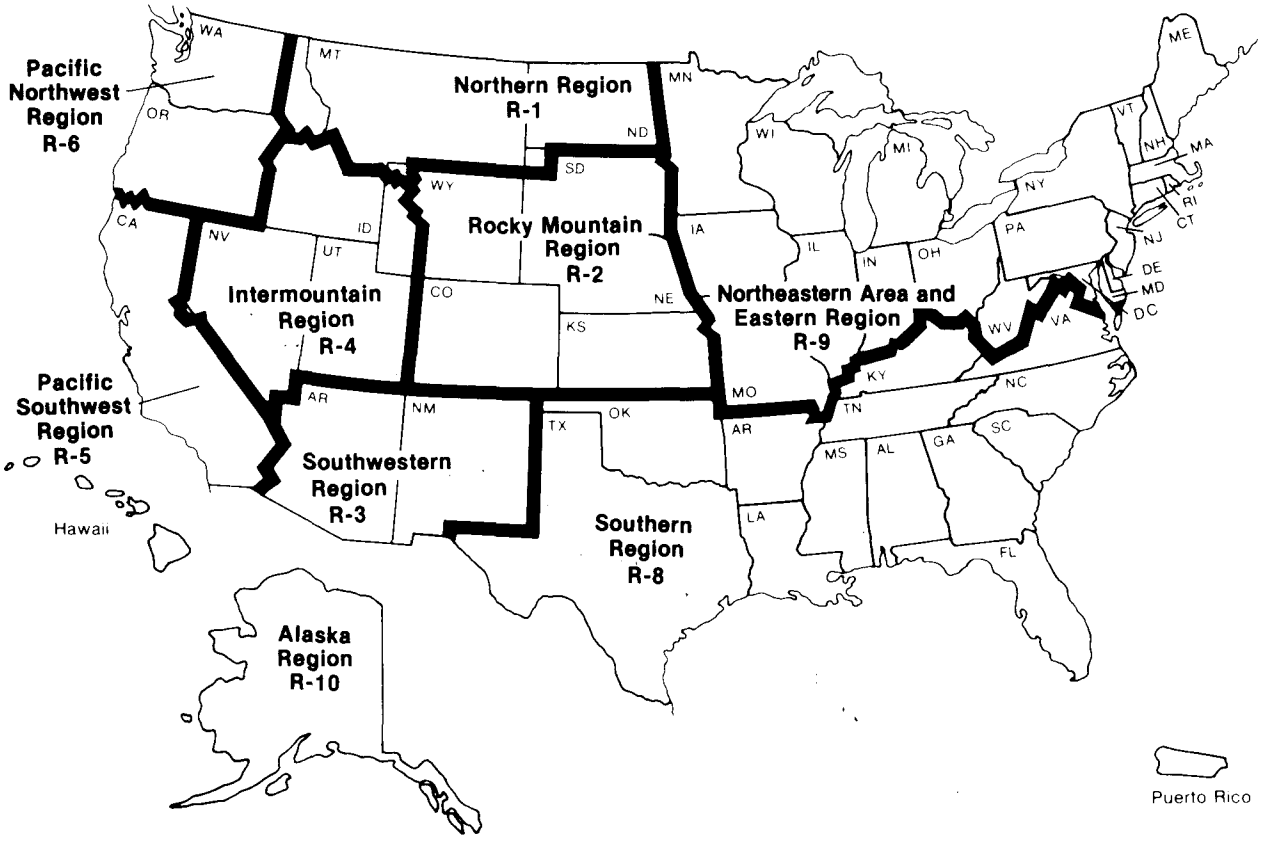
## USDA Forest Service Regions and Area



## Contents

## Addresses

Addresses of regional Forest Pest Management offices:

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

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

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

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

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

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

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

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

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

## Introduction

This publication reports the status of insects and diseases on the Nation's forests during 1983. The information is organized by Forest Service Region: Each Region has an insect table and a disease table. Tables and maps with information on some of the major pests follow the regional tables.

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 information gathered in forest resource inventory surveys.

Those inventory surveys--part of the Forest Service Renewable Resource Inventory Program--show that the unsalvaged growing stock mortality on commercial timberland averages about 3.9 billion cubic feet per year. This mortality figure can be divided into three categories: mortality caused by fire, by insects and diseases, and by other causes. When mortality is separated by cause, insects and diseases are shown to kill 2.4 billion cubic feet of commercial timber each year. In fact, insect and diseases kill more trees each year than fire and all other causes combined.

This is the 33rd annual report published by the U.S. Department of Agriculture, Forest Service, Forest Pest Management, Washington Office. 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 iv.

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

Thomas H. Hofacker, Staff Entomologist
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## Eastern Conditions

Forest resource inventory surveys show that the unsalvaged growing stock mortality from all causes on eastern commercial timberland averages about 2.3 billion cubic feet per year. Insects and diseases account for 1.4 billion cubic feet--about 62 percent--of this total.

In 1983, the gypsy moth defoliated approximately 2.4 million acres (table 1, p. 59, and fig. 1, p. 63). Defoliated acreage was down dramatically from the 8.2 million acres recorded in 1982. The area generally infested with gypsy moth now extends from Maine south into northern Virginia and west into eastern Ohio. In 1983, 28 isolated infestations, remote from the generally infested area, were discovered in 10 States: California, Illinois, Indiana, Minnesota, North Carolina, Ohio, Oregon, Virginia, Washington, and Wisconsin. Nine isolated infestations are still present in Illinois, Oregon, and Washington.

After declining for 2 consecutive years, spruce budworm defoliation again topped the 6-million-acre mark: Defoliation was recorded on 6,488,452 acres (table 2, p. 60, and fig. 2, p. 63). The State of Maine was most severely affected: Spruce and fir mortality totaled over 2 million cords in 1983.

Southern pine beetle activity increased for the second year in a row. Sixty-six counties in eight States reported outbreak levels (fig. 3, p. 64). The National Forests in Texas were especially hard hit.

Fusiform rust, annosus root rot, and littleleaf disease caused considerable damage to southern pine forests. Fusiform rust stem infections occur on at least 10 percent of the pines growing on about 14 million acres (table 3, p. 60). Annosus root rot hazard is greatest on deep, sandy soils with good internal drainage. These soils occur on about 20 percent of the South's land base. Littleleaf disease commonly occurs on clay soils in the South's Piedmont region. About 15 million acres of commercial shortleaf pine are affected (fig. 4, p. 64).

In the Northeast, tree decline and mortality were reported more frequently than last year. Drought, coupled with pest problems and perhaps man-caused stress, may be contributing to several of the reported tree decline problems.

**Western Conditions**

Forest resource inventory surveys show that the unsalvaged growing stock mortality from all causes on western commercial timberland averages about 1.6 billion cubic feet per year. Insects and diseases account for 1 billion cubic feet--about 61 percent--of this total.

Western spruce budworm defoliation increased significantly for the second year in a row. About 11 million acres of defoliation were recorded in 1983 (table 4, p. 61, and fig. 5, p. 65). This total represents an increase of over 6 million acres since 1981.

Mountain pine beetle outbreaks extended over 3.5 million acres (fig. 6, p. 65). Colorado, Montana, Oregon, Utah, Washington, and Wyoming were most severely affected.

Root diseases and dwarf mistletoes were the most damaging diseases of western conifers. Root disease losses are shown in table 5 (p. 61). Dwarf mistletoe losses are shown in table 6 (p. 62).

Other important conifer diseases included various foliage diseases, which are numerous and widespread; white pine blister rust, which causes lethal stem and branch cankers and is the most important disease of western white and sugar pines; and stem decay fungi, which continue to cause considerable damage in old-growth conifer stands.

## Northern Region (R-1)

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 aphid *Adelges piceae* | Grand fir, subalpine fir | Idaho | This adelgid was recently found in Coeur d'Alene and at numerous locations near Moscow. Mortality is occurring to the more heavily infested subalpine fir. |
| Cranberry girdler moth *Chrysoteuchia topiaria* | Douglas-fir, larch | Idaho | This sod webworm has increased slightly in nursery beds at the Coeur d'Alene Nursery. |
| Douglas-fir beetle *Dendroctonus pseudotsugae* | Douglas-fir | Idaho, Montana, Wyoming | Douglas-fir beetle activity remained static in Idaho. Activity on the National Forests and Glacier National Park in Montana and Yellowstone National Park in Wyoming remained static. |
| Douglas-fir needle midge *Contarinia pseudotsugae* | Douglas-fir | Idaho, Montana | Defoliation by this midge is still conspicuous. |
| Douglas-fir tussock moth *Orgyia pseudotsugata* | Douglas-fir, true firs, spruce | Idaho, Montana | Pheromone trapping of adult male moths showed an increase north of Moscow, Idaho, but decreased or remained static in other areas. In Montana, trap catches were greater than last year. Defoliation of ornamentals occurred in Hayden Lake, Coeur d'Alene, Moscow, Craigmont, Nezperce, and Gennesee, Idaho. Defoliation of ornamentals occurred in Polson, Sommers, and Missoula, Mont. |
| Fall webworm *Hyphantria cunea* | Apple, chokecherry | North Dakota | The numbers of webs of this insect were abundant in southeast North Dakota this year. |
| Fir engraver *Scolytus ventralis* | Grand fir, subalpine fir | Idaho, Montana | Populations doubled this year south and east of Plummer, Idaho. Populations remained static in Montana. |
| Gypsy moth *Lymantria dispar* | Hardwoods | Montana | Two male moths were trapped: one moth in Glacier National Park and the other moth on the Flathead National Forest near Swan Lake. |
| Larch budmoth *Zeiraphera improbana* | Larch | Montana | This insect was found this year for the first time since the 1960's. It caused defoliation on several thousand acres on the Flathead Indian Reservation. |

Northern Region (R-1)--continued

| Insect | Host | Location | Remarks |
|---|---|---|---|
| Larch casebearer<br>Coleophora laricella | Larch | Idaho,<br>Montana | Defoliation has reached its lowest point in several years. |
| Lodgepole terminal weevil<br>Pissodes terminalis | Lodgepole pine | Montana | Populations remained static at high levels in many lodgepole pine plantations. |
| Mountain pine beetle<br>Dendroctonus ponderosae | Lodgepole pine,<br>ponderosa pine,<br>other pines | Idaho,<br>Montana,<br>Wyoming | Infestations increased in Idaho on the Nezperce and Bitterroot National Forests. In Montana, beetle populations declined due to host depletion in several areas where infestations have run their course. Infestations persist on the Beaverhead, Flathead, Gallatin, Kootenai, Lewis and Clark, and Lolo National Forests; Glacier and Yellowstone National Parks; the Blackfoot, Crow, and Flathead Indian Reservations; and on Bureau of Land Management lands in the Centennial Mountains. Less extensive infestations occur on the Custer, Deerlodge, and Helena National Forests and the Fort Belknap and North Cheyenne Indian Reservations. Most mortality occurs in lodgepole pine. Beetle infestations cover nearly 1.2 million acres of lodgepole pine and about 300,000 acres of ponderosa pine, whitebark pine, and western white pine. |
| Pine bark aphid<br>Pineus sylvestris | Scotch pine | Montana | The pine bark aphid is still damaging Christmas tree plantings near Bigfork and Kalispell. |
| Pine butterfly<br>Neophasia menapia | Ponderosa pine,<br>lodgepole pine | Idaho,<br>Montana | Populations are still increasing in the Bitterroot Valley south of Missoula and along the Salmon River in Idaho, but no visible defoliation was noticed. |
| Pine engraver beetle<br>Ips pini | Pines | Idaho,<br>Montana | Pine engraver-caused mortality increased markedly this year on the Mica State Forest in Idaho. Activity remained fairly static in Montana. |
| Pine needle sheathminer<br>Zelleria haimbachi | Pines | Montana | Pine needle sheathminer increased on pines. |

Northern Region (R-1)--continued

| Insect | Host | Location | Remarks |
|---|---|---|---|
| Spruce beetle<br>*Dendroctonus rufipennis* | Engelmann spruce, other spruces | Idaho, Montana | More than 35,000 acres of spruce beetle-attacked trees were detected on the Flathead, Kootenai, and Lolo National Forests; the Flathead Indian Reservation; and the Glacier National Park in Montana. This was a slight decrease from last year. Spruce beetle activity in Idaho decreased markedly. |
| Variable oakleaf caterpillar<br>*Heterocampa manteo* | Bur oak, aspen, basswood | North Dakota | Variable oakleaf caterpillars were common in natural hardwood stands checked. Defoliation occurred in the Sully's Hill National Game Preserve and along the Sheyenne River between Kindred and Valley City. |
| Western balsam bark beetle<br>*Dryocoetes confusus* | Subalpine fir | Montana, Wyoming | Infestations occurred mainly on the Flathead and Gallatin National Forests. Other infested areas occurred on the Beaverhead National Forest, the Flathead Indian Reservation, and Glacier and Yellowstone National Parks. |
| Western pine shoot borer<br>*Eucosma sonomana* | Ponderosa pine | Idaho, Montana | Pine shoot borer is still causing height growth reduction in plantations in Idaho and Montana. Over 50 percent of the terminals are infested at some locations. |
| Western spruce budworm<br>*Choristoneura occidentalis* | Douglas-fir, true firs, spruce | Idaho, Montana, Wyoming | Budworm defoliation increased in north Idaho and Montana. Outbreaks on the Beaverhead, Deerlodge, and Gallatin National Forests and Yellowstone National Park increased in intensity. About 2.6 million acres of defoliation occurred this year. Populations will probably continue increasing for several years. |
| Yellownecked caterpillar<br>*Dantana ministra* | Hardwoods | North Dakota | This insect caused heavy defoliation in southeast North Dakota in late August. |

Northern Region (R-1)

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 | | | |
| Atropellis canker<br>*Atropellis piniphila* | Lodgepole pine | Idaho, Montana | Severe damage occurs on the Helena National Forest in mature lodgepole pine and on the Flathead Indian Reservation in seedling/sapling lodgepole pine. A pole-sized lodgepole pine stand south of Grangeville, Idaho, has infection levels exceeding 90 percent. |
| Comandra blister rust<br>*Cronartium comandrae* | Lodgepole pine | Idaho, Montana | Comandra rust is common on lodgepole and ponderosa pines in many parts of the Region. |
| Dwarf mistletoe blister rust<br>*Peridermium bethelii* | Lodgepole pine | Montana | This rust fungus superinfects lodgepole pine only where dwarf mistletoe infections occur. |
| Dwarf mistletoes | | | |
| *Arceuthobium americanum* | Lodgepole pine | Idaho, Montana | Nearly 47 million cubic feet of lodgepole pine, Douglas-fir, and western larch growth are lost annually on lands of all ownerships in Montana and northern Idaho. Infested area in two States is about 3.1 million acres. |
| *Arceuthobium douglasii* | Douglas-fir | Idaho, Montana | |
| *Arceuthobium laricis* | Western larch | Idaho, Montana | |
| Fire blight<br>*Erwinia amylovora* | Apple, pear, cotoneaster, mountain ash | North Dakota | This bacterial disease was quite prevalent throughout the State. |
| Western gall rust<br>*Endocronartium harknessii* | Ponderosa pine, lodgepole pine, Scotch pine | Idaho, Montana, North Dakota | Occurs frequently on pines, but it is usually not too severe. In Idaho and North Dakota, the rust is causing some degrade to Scotch pine in Christmas tree plantings. |
| White pine blister rust<br>*Cronartium ribicola* | Western white pine | Idaho, northwestern Montana | The rust resistance breeding program continues to improve, with more western white pine seed collected each year from disease-resistant orchards. Risk of rust infection apparently varies with site conditions: In some low-risk areas, naturally occurring white pine can be grown successfully. Techniques for risk-rating individual stands are being refined; management guides written. |

Northern Region (R-1)--continued

| Disease | Host | Location | Remarks |
|---|---|---|---|
| Root Disease | | | |
| Annosus root rot<br>*Heterobasidion annosum* | Ponderosa pine, western hemlock, subalpine fir | Idaho, Montana | Root diseases are probably the most important long-term disease problems in the Northern Region's forests. Root disease/bark beetle complexes account for significant annual mortality in mixed conifer stands. Losses are especially severe in Douglas-fir and grand fir stands which have a history of logging. Presence of bark beetles and root pathogens, which interact to cause tree mortality, makes recognition and treatment difficult. *Phellinus weirii* and *Armillaria mellea* are commonly associated with Douglas-fir beetle on Douglas-fir and fir engraver on grand fir. Black stain root disease of ponderosa pine is associated with western pine beetle attacks. *P. weirii* and *A. mellea* are also killing seedlings in planted or naturally regenerated stands centered around old infected stumps from the previous stand. |
| Black stain root disease<br>*Ceratocystis wageneri* | Douglas-fir, lodgepole pine, ponderosa pine | Idaho, Montana | |
| Laminated root rot<br>*Phellinus weirii* | Douglas-fir, grand fir, redcedar, other conifers | Idaho, Montana | |
| Red-brown butt rot<br>*Phaeolus schweinitzii* | Douglas-fir, other conifers | Idaho, Montana | |
| Shoestring root rot<br>*Armillaria mellea* | Douglas-fir, other conifers | Idaho, Montana | |
| Foliage Disease | | | |
| Dothistroma needle blight<br>*Dothistroma pini* | Ponderosa pine, lodgepole pine, western white pine | Idaho | Incidence was severe on many areas and is still evident in and near the Wilderness Gateway Campground on the Clearwater National Forest. Some ponderosa pine mortality has occurred because of this disease. |
| Larch needle blight<br>*Hypodermella laricis*<br>Meria needle disease<br>*Meria laricis* | Western larch | Idaho, Montana | Incidence of both needle diseases has declined; discoloration occurred only in groups of trees rather than in most larch stands as in years past. |
| Lophodermium needle cast<br>*Lophodermium pinastri* | Scotch pine | Idaho, Montana | Incidence of this needle cast was much lower this year. Most areas are showing recovery. |
| 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 | |
| *Lophodermella* spp. | Ponderosa pine | North Dakota | |
| *Rhabdocline pseudotsugae* | Douglas-fir | Idaho, Montana | |

Northern Region (R-1)--continued

| Disease | Host | Location | Remarks |
|---|---|---|---|
| Swiss needle cast<br>*Phaeocryptopus gaumanni* | Douglas-fir, western larch | Idaho, Montana | This needle cast has become a severe problem in Christmas tree culture. Concentrated damage was noticed near Coeur d'Alene and the Priest River Experimental Forest in Idaho. The disease had a serious impact on Christmas tree cutters in Montana, especially in the Eureka area in northwest Montana. |
| Vascular Wilt | | | |
| Dutch elm disease<br>*Ceratocystis ulmi* | American elm | Montana, North Dakota | Dutch elm disease is still prevalent in Billings and Missoula, Mont. The disease is increasing in North Dakota: The Lisbon area is a hot spot, and several new infections occurred on the Sully's Hill National Game Preserve near Devils Lake. |
| Nursery Disease | | | |
| Chokecherry shot hole<br>*Coccomyces hiemalis* | Chokecherry | Montana | Shot hole disease on chokecherry grown for windbreak plantings occurred at the Montana State Nursery, Missoula. |
| Diplodia tip blight<br>*Diplodia pinea* | Ponderosa pine | Idaho | Severe damage to 1-0 bareroot seedlings occurred in a private nursery near Peck. |
| Fusarium root disease<br>*Fusarium oxysporum*<br>*Fusarium soloni* | Douglas-fir, other conifers | Idaho, Montana | Fusarium root disease was common on both container-grown and bareroot seedlings at the Coeur d'Alene Nursery and a private nursery near Peck, Idaho. The disease caused extensive losses at a private nursery in Kalispell, Mont., and some losses at the Montana State Nursery at Missoula. |
| Grey mold<br>*Botrytis cinerea* | Western larch, lodgepole pine | Idaho, Montana | Occurred in container-grown seedlings at the Coeur d'Alene Nursery. |
| Meria needle disease<br>*Meria laricis* | Western larch | Idaho | This fungus caused severe losses in 2-0 bareroot seedlings at the Coeur d'Alene Nursery. |
| Phoma blight<br>*Phoma eupyrena* | Mugho pine | Idaho | Severe damage occurred at a private nursery near Peck. |
| Sirococcus tip blight<br>*Sirococcus strobilinus* | Ponderosa pine, Engelmann spruce | Idaho | Sirococcus tip blight continues to cause damage at two private nurseries near Bonners Ferry but was not as severe as last year. The disease was found this year for the first time on container-grown Engelmann spruce at the Coeur d'Alene Nursery. |

Northern Region (R-1)--continued

| Disease | Host | Location | Remarks |
|---|---|---|---|
| Western gall rust *Endocronartium harknessii* | Ponderosa pine | Montana | This rust was found in several trees in a seed orchard in Plains. Stock came from an adjacent bareroot nursery, but did not show symptoms at planting. |
| Abiotic | | | |
| Chemical damage | Hardwoods | North Dakota | Chemical damage is considered by many to be the major damaging agent in North Dakota shelterbelts. |

Rocky Mountain Region (R-2)

Status of insects in Colorado, Kansas, Nebraska, South Dakota, and central and eastern Wyoming.

| Insect | Host | Location | Remarks |
|---|---|---|---|
| A leaf miner<br>*Phyllonorycter* sp.<br>probably *tremuloidiella* | Cottonwood | Wyoming | Infestations are found in Converse, Goshen, Natrona, and Uinta Counties. |
| American dagger moth<br>*Acronicta americana* | Silver maple | Colorado | Feeding damage causing leaf drop in Denver metro area. |
| *Archips negundanus* | Boxelder | Colorado | Moderate feeding occurred on boxelder along drainages and on ornamentals in Garfield and Jefferson Counties. |
| Ash flower gall mite<br>*Eriophyes fraxiniflora* | Green ash | Wyoming | Population was heavy on some green ash in Powell. |
| Ash plant bug<br>*Neoborus amoennus* | Green ash | South Dakota | Esthetic damage occurred on 80 trees in Rapid City. |
| Bronze birch borer<br>*Agrilus anxius* | Birch | Colorado,<br>South Dakota | A serious problem of ornamentals, particularly in the Denver metro area. |
| Cankerworms<br>*Alsophila pometaria*<br>*Paleacrita vernata* | Hackberry,<br>honeylocust,<br>ash, elm | Kansas,<br>South Dakota | Defoliation occurred in many areas of Kansas and South Dakota. |
| Cooley spruce gall aphid<br>*Adelges cooleyi* | Blue spruce,<br>Engelmann spruce,<br>Douglas-fir | Colorado | A ubiquitous pest of ornamentals. |
| Cottonwood budgall mite<br>*Aceria parapopuli* | Cottonwood | Wyoming | Continues to be a problem at Laramie. |
| Cottony maple scale<br>*Pulvinaria innumerabilis* | Maples,<br>boxelder | Wyoming | Infestations in maple reported at Torrington; infestations in boxelder in Big Horn County. |
| Douglas-fir beetle<br>*Dendroctonus pseudotsugae* | Douglas-fir | Colorado,<br>Wyoming | Scattered tree killing occurs in Wyoming and Colorado. Populations are building in Colorado, most notably at Douglas Pass north of Grand Junction. |
| Douglas-fir tussock moth<br>*Orgyia pseudotsugata* | Blue spruce | Colorado | Ornamental blue spruce in the metro communities along the Colorado Front Range continue to be defoliated. |
| Elm leaf beetle<br>*Pyrrhalta luteola* | American elm,<br>Siberian elm | Colorado,<br>Nebraska,<br>South Dakota | A chronic pest of ornamentals in the metropolitan areas. |

Rocky Mountain Region (R-2)--continued

| Insect | Host | Location | Remarks |
|---|---|---|---|
| Fall webworm<br>*Hyphantria cunea* | Cottonwood, plum, chokecherry, wild rose | Colorado, Kansas, South Dakota, Wyoming | Fall webworm occurred commonly in cottonwood along drainages, especially in Colorado and South Dakota. |
| Forest tent caterpillar<br>*Malacosoma disstria* | Green ash, crab apple | Colorado | Denver ornamentals suffered some defoliation. |
| Green ash (lilac) borer<br>*Podosesia syringae syringae* | Green ash | Colorado, South Dakota | Causing major problems in many shelterbelts, especially in younger trees. Mortality, tree form damage, and stem weakening have been reported. Some damage to young green ash in Denver. |
| Gypsy moth<br>*Lymantria dispar* | Hardwoods | South Dakota | Egg masses were found in Custer in 1982; male moths were caught in 1983. |
| Honeylocust podgall midge<br>*Dasineura gleditschiae* | Honeylocust | Colorado, Wyoming | Caused twig dieback in Denver metro area and in Wheatland. |
| Honeysuckle leaffolding aphid<br>*Hyadaphis tataricae* | Honeysuckle | Nebraska, South Dakota | Raising havoc in windbreaks and ornamentals. |
| Mountain pine beetle<br>*Dendroctonus ponderosae* | Lodgepole pine, ponderosa pine | Colorado, South Dakota, Wyoming | In lodgepole pine, mountain pine beetle continues to build. The outbreak in north-central Colorado intensified in 1983, and tree losses are estimated to be about 800,000. In Wyoming, some infestation areas on the Shoshone National Forest remained static; elsewhere, however, the trend is still increasing. Casper, Muddy, Shirley, and Ferris Mountains all have expanding beetle outbreaks. The newest infestation area in the Little Snake River is expanding rapidly.<br><br>In ponderosa pine, mountain pine beetle activity is down, except on the Uncompahgre Plateau in Colorado. The mountain pine beetle, along with roundheaded and western pine beetles, is causing considerable tree loss in southwest Colorado. |
| Oak twig girdler<br>*Oncideres cingulata* | Red oak | Nebraska | Causing some branch mortality. |
| Oystershell scale<br>*Lepidosaphes ulmi* | Aspen, ash, pinyon pine | Colorado | A chronic pest on ornamentals and on pinyon in Mesa Verde National Park. |

Rocky Mountain Region (R-2)--continued

| Insect | Host | Location | Remarks |
|---|---|---|---|
| Pine budworm<br>*Choristoneura lambertiana* | Ponderosa pine | Colorado | Defoliation damage was common in ponderosa pine along the Front Range and southern Colorado. |
| Pine engraver beetles<br>*Ips* spp. | Ponderosa pine, lodgepole pine, pinyon pine | Colorado, Kansas, South Dakota, Wyoming | *Ips* populations were prevalent in local areas with fresh slash and trees weakened from other sources. |
| Pine moths<br>*Dioryctria ponderosae*<br>*Dioryctria tumicolella* | Scotch pine, Austrian pine, ponderosa pine | Colorado, Nebraska, South Dakota | These two species have previously been reported as *D. zimmermani*. Damage is common in young pines in shelterbelts in all three States. Damage is most severe in central and western Nebraska. |
| Pine needleminer<br>*Coleotechnites ponderosae* | Ponderosa pine | Colorado, Wyoming | The needleminer infestations are primarily located on the Front Range. Populations appeared to be higher than in 1982. Ponderosa pine near Cheyenne is infested. |
| Pine needle scale<br>*Chionaspis pinifoliae* | All pines | Colorado, Nebraska | A chronic pest of ornamentals in the metropolitan areas of Colorado. Ponderosa pines in the Bessey division of the Nebraska National Forest have large populations. |
| Pine needle sheathminer<br>*Zelleria haimbachi* | Ponderosa pine | Colorado, Nebraska | Pine needle sheathminer is a common associate with pine budworm in Colorado. Infestations are light. |
| Pine tiger moth<br>*Halisidota ingens* | Ponderosa pine, pinyon pine | Colorado | Scattered; occurring in ponderosa pine and pinyon. |
| Pine tip moth<br>*Rhyacionia* sp. | Austrian pine, Mugho pine, ponderosa pine, Scotch pine | Colorado, Kansas, Nebraska, South Dakota | Continues to be a problem on young pine, especially in shelterbelts and ornamentals. |
| Pitch mass borers<br>*Dioryctria ponderosae*<br>*Dioryctria* sp. near *okanaganella* | Pinyon pine | Colorado | A serious problem of ornamentals, especially in Denver area. |
| Pitch nodule moth<br>*Petrova* sp. | Ponderosa pine, pinyon pine | Colorado, Nebraska | Frequently found on young ponderosa in Nebraska. Very common on ornamental pinyon in Denver area. |
| Popular blackmine beetle<br>*Zeugophora scutellaris* | Cottonwood | Colorado | Occurs statewide. |

Rocky Mountain Region (R-2)--continued

| Insect | Host | Location | Remarks |
|---|---|---|---|
| Poplar vagabond aphid *Mordvilkoja vagabunda* | Cottonwood, aspen | Colorado, Wyoming | Problem continues at Laramie. Observed in many locations. |
| Putnam scale *Diaspidiotus ancylus* | Cottonwood | Wyoming | Occurs on older cottonwood in Laramie. |
| Red turpentine beetle *Dendroctonus valens* | Ponderosa pine | Colorado, South Dakota | Populations at low levels. |
| San Jose scale *Quadraspidiotus perniciosus* | Apple | Wyoming | Heavy infestations in the Torrington area. |
| Silver-spotted tiger moth *Halisidota argentata subalpine* | Pinyon pine, juniper | Colorado | An outbreak of 10,000 acres with heavy defoliation was discovered south of Montrose; permanent damage is not expected. |
| Spittlebugs *Clastoptera* sp. | Utah juniper | Colorado | Spittlebugs were common at Mesa Verde National Park. |
| Spruce beetle *Dendroctonus rufipennis* | Spruce | Colorado, Wyoming | Populations of spruce beetle continue, with some increase on the Rio Grande National Forest. Timber sales, in conjunction with trap tree logging and sanitation cutting, are salvaging much of the loss. The Rabbit Ears infestation on the Routt National Forest is down following heavy salvage of the infested trees. Wyoming populations are low, and no new activity was noted in 1983. |
| Spruce needle miner *Taniva albolineana* | Spruce | South Dakota | Occurs primarily in southeast quarter of South Dakota. |
| Spruce spider mites *Oligonychus ununguis* | Spruce | Colorado, South Dakota | An increasing problem statewide on ornamentals and shelterbelts. |
| Uglynest caterpillar *Archips cerasivorana* | Plum, chokeberry | South Dakota | Near Sioux Falls, 25 acres were heavily infested; along the Missouri River near Pierre, several plantings infested. |
| Variable oakleaf caterpillar *Heterocampa manteo* | Bur oak | South Dakota | Scattered defoliation in South Dakota. |
| Western balsam bark beetle *Dryocoetes confusus* | Subalpine fir | Colorado | Scattered loss continues throughout the range of fir in Colorado. |

Rocky Mountain Region (R-2)--continued

| Insect | Host | Location | Remarks |
|---|---|---|---|
| Western conifer seed bug *Leptoglossus occidentalis* | Scotch pine | Nebraska | Populations were very high in a seed orchard in eastern Nebraska. |
| Western spruce budworm *Choristoneura occidentalis* | Douglas-fir, white fir | Colorado, Wyoming | Western spruce budworm is building momentum after a slight decline in 1982. Moderate defoliation was mapped on 2,750,311 acres. Egg mass surveys indicate there should be moderate to heavy defoliation in the same areas in 1984. |
| Western tent caterpillar *Malacosoma californicum* | Aspen, serviceberry, bitterberry | Colorado | The western tent caterpillar outbreaks on the east side of the San Juan National Forest expanded greatly in 1983. The east side of the infestation now extends onto the Rio Grande National Forest. The gross acreage is estimated to be 66,000 acres on both National Forests and adjacent private lands. On serviceberry and bitterberry, western tent caterpillar was observed in Mesa Verde National Park and elsewhere in Colorado. |
| Whitemarked tussock moth *Orgyia leucostigma* | Hackberry, silver maple, elm | Nebraska | Caused extensive defoliation at scattered locations throughout Nebraska. |

Rocky Mountain Region (R-2)

Status of diseases in Colorado, Kansas, Nebraska, South Dakota, and central and eastern Wyoming.

| Disease | Host | Location | Remarks |
|---|---|---|---|
| Stem and Branch | | | |
| Comandra blister rust *Cronartium comandrae* | Lodgepole pine | Western Wyoming | Continues to be the most important disease problem on the Wind River Ranger District, Shoshone National Forest. A survey of the commercial lodgepole pine type indicated the rust is a primary cause of mortality in at least 50 percent of the standing dead saplings and poles. |
| Crown gall *Agrobacterium tumefaciens* | Cottonwood | Colorado | Some reports this year. |
| Cytospora cankers *Cytospora* spp. | Various hardwoods | Colorado | Cankers girdled branches and boles, resulting in considerable dieback and some mortality. |
| Dwarf mistletoe blister rust *Peridermium bethelii* | Lodgepole pine | Colorado | This rust, which is associated with *Arceuthobium americanum*, was found to be common in two new areas: Taylor Park, Gunnison National Forest; and Fraser Experimental Forest, Arapaho National Forest. |
| Dwarf mistletoes *Arceuthobium americanum* | Lodgepole pine | Colorado, Wyoming | Continues to be the most important disease problem in the Region. An estimated 51 percent of the lodgepole pine type is infested. The annual merchantable loss is approximately 10 million cubic feet on National Forests alone. |
| *Arceuthobium vaginatum* subsp. *cryptopodum* | Ponderosa pine | Colorado | From an extensive roadside survey on three National Forests, an estimated 20 percent of the ponderosa pine type is infested. An evaluation of the roadside survey technique showed a high correlation between dwarf mistletoe intensity along the roadside and conditions 2 chains from the road. |
| Fire blight *Erwinia amylovora* | Apple | Colorado | Common due to wet spring. |
| Hypoxylon canker *Hypoxylon mammatum* | Aspen | Southwestern Colorado | Common on Mancos Ranger District, San Juan National Forest. |
| Siberian elm canker *Botryodiplodia hypodermia* | Siberian elm | South Dakota | Of nine shelterbelts (generally 20 years old) surveyed, all were infected: 85 percent of the trees had one or more small cankers. |

Rocky Mountain Region (R-2)--continued

| Disease | Host | Location | Remarks |
|---|---|---|---|
| Slime flux<br>*Erwinia* sp.<br>*Corynobacterium* sp. | Cottonwood, elm, maple, willow | Colorado | Common in the Denver area; some reports elsewhere. Severe infections cause leaves to dry up and drop early. |
| Thyronectria canker<br>*Thyronectria austro-americana* | Honeylocust | Colorado | This canker, which is killing honeylocust in the Denver area, is the most common disease on privately owned trees. |
| Root Disease | | | |
| Annosus root rot<br>*Heterobasidion annosum* | Jack pine | Nebraska | Additional infection centers found on the Bessey Ranger District, Nebraska National Forest. The present infection covers about one-quarter acre, which was thinned earlier. No trees are being cut within 30 feet of the infected area and stump surfaces are treated with borax. |
| Black stain root disease<br>*Ceratocystis wageneri* | Pinyon pine | Western Colorado | The primary root disease in pinyon type west of the Continental Divide. Trenching and silvicultural treatments are being tested in Mesa Verde National Park to limit spread. Collection and isolation of fungi from insect vectors and studies on the longevity of the pathogen within killed trees continue. |
| Shoestring root rot<br>*Armillaria mellea* | All conifers | Colorado, South Dakota, Wyoming | The most prevalent root disease in the Region. A survey on 363,200 acres of the San Juan National Forest found 24 percent of the spruce-fir type was infected.<br><br>Mortality of subalpine fir at two Colorado ski areas stimulated interest in the formulation of long-term vegetation management plans. *Armillaria mellea* and several bark beetles are involved.<br><br>A survey conducted around Deadwood, S. Dak., in the Black Hills National Forest implicates *A. mellea*-infected ponderosa pine as foci for mountain pine beetle attacks during endemic beetle cycles.<br><br>Widespread subalpine fir mortality attributed to western balsam bark beetle and root rot continues throughout the White River National Forest, Colorado. |

Rocky Mountain Region (R-2)--continued

| Disease | Host | Location | Remarks |
|---|---|---|---|
| Foliage Disease | | | |
| Anthracnose<br>*Gloeosporium* spp. | Sycamore | Colorado | Some reports this year. Considerable defoliation frequent in Denver metropolitan area. |
| *Gnomonia veneta* | Sycamore | Nebraska | Common throughout Nebraska. |
| *Gnomonia leptostyla* | Walnut | East-central South Dakota | Abnormally cool, wet spring weather increased incidence and severity. Over 300 trees in two small plantations in Newton Hills State Park were heavily infected. |
| Apple scab<br>*Venturia inaequalis* | Crabapple | Colorado | Reported for the first time near Steamboat Springs, Colo. |
| Ash anthracnose<br>*Gloeosporium aridum* | Green ash | Eastern Nebraska | Common. |
| Diplodia tip blight<br>*Diplodia pinea* | Ponderosa pine | South Dakota | Small infections reported frequently throughout State, including Bennett County. Large numbers of infected trees reported from shelterbelts in Sioux Falls District, including over 200 trees on 1 acre. In the Black Hills, infection is still declining from 1979 reports. |
| Fir needle rust<br>*Pucciniastrum goeppertianum* | White fir, subalpine fir | Colorado | Branches with yellow aecia on needles collected in the fall on the Arapaho and Roosevelt and the Grand Mesa National Forests. |
| Ink spot<br>*Ciborinia whetzelii* | Aspen | Colorado | Widely observed this year. The Crystal River drainage and the Aspen area, White River National Forest, were heavily infected. |
| Juniper blight<br>*Phomopsis juniperovora*<br>*Cercospora sequoiae* | Eastern redcedar, Rocky Mountain juniper | East-central South Dakota | Numerous reports of light infections aggravated by cool, wet spring. |
| Marssonina blight and leaf spot<br>*Marssonina populi* | Aspen, poplars, Austrian pine | Colorado, Nebraska | Very common throughout Colorado due to wet spring. Some premature defoliation. In Nebraska, branch dieback and tree mortality common in windbreaks and urban plantings. |
| Melampsora rust<br>*Melampsora medusae* | Aspen | Colorado | Some reports this year. |

Rocky Mountain Region (R-2)--continued

| Disease | Host | Location | Remarks |
|---|---|---|---|
| Needle cast<br>*Lophodermium* sp. | Lodgepole pine | Wyoming | Extensive areas with low-grade infection following two or three seasons of frost damage on the Bighorn National Forest. |
| Powdery mildew<br>*Podosphaera leucotricha* | Apple | Colorado | Very common throughout Colorado due to very wet spring. |
| Shepherd's crook<br>*Venturia tremulae* | Cottonwoods, poplars | Colorado | Some reports this year. Spread by wet weather. |
| Shot hole leaf spot<br>*Coccomyces* sp. | Plum | Colorado | Some reports this year. |
| Vascular Wilt | | | |
| Dutch elm disease<br>*Ceratocystis ulmi* | American elm | Nebraska, South Dakota | In South Dakota, confirmed in four new counties: Campbell, Corson, Ziebach, and Dewey. Only five South Dakota counties are still free from confirmed cases of Dutch elm disease. A survey of 51 percent of the communities in the eastern two-thirds of the State indicated losses of 6.6 percent, or 4,786 urban trees. In the survey area, 68,000 susceptible elms out of an original 375,000 elms remain. In Nebraska, Dutch elm disease continues to be a problem. |
| | Elm species | Colorado | In 57 of the 122 areas with significant elm populations, 773 cases reported. Excellent sanitation programs are being conducted in 71 areas. |
| Verticillium wilt<br>*Verticillium* sp. | Sumac, catalpa, silver maple, golden raintree, Russian olive | Colorado Front Range | Often isolated this year. Continues at low level in Denver area. |
| Nursery Disease | | | |
| Damping-off<br>*Pythium* spp.<br>*Fusarium* spp. | Conifers | Colorado | Evaluation of soil solar heating for control of pathogens and weeds was completed at the Colorado State Forest Service Nursery, Fort Collins. Significant control was achieved with the techniques. |
| Fusarium root disease<br>*Fusarium oxysporum* | Lodgepole pine | Nebraska | Isolated from dying 1-0 pine at the Bessey Nursery. The infection was in an area where the nursery bed cannot be fumigated because of permanent irrigation pipes, so infected soil is always present and serves as a source of inoculum to the adjacent seedbeds. |

Rocky Mountain Region (R-2)--continued

| Disease | Host | Location | Remarks |
|---|---|---|---|
| Shot hole | Chokecherry | Nebraska | The disease was not controlled by regular fungicide applications at the Bessey Nursery. The pathogen is probably Coccomyces sp., but has not been confirmed. |
| Tip blight | Ponderosa pine | Colorado | Ponderosa pine seedlings growing at the Southern Ute Greenhouse exhibited purplish shoot dieback attributed to Sirococcus sp., but not confirmed. |
| Abiotic | | | |
| Air pollution | Ponderosa pine | Colorado Front Range | Examination of permanent plots indicated no ozone injury. |
| Aspen mortality | Aspen | Southern Colorado, northern New Mexico | According to recently compiled research and survey results, partial cutting of aspen results in 26 percent mortality of residuals within 9 years due to canker and root disease fungi and windthrow. |
| Chemical damage | All species | Eastern South Dakota | Many more instances than usual this year. Over 12 cases known; about 24 suspected. Near Yankton, 40 acres severely damaged from drifting spray. |
| Conifer decline | Ponderosa pine | Southwest Colorado | Extensive areas suffering suspected environmental malady involving moisture stress and/or air pollutants. Various insects present in these areas; further investigation planned. |
| Hackberry decline | Hackberry | Nebraska | Apparently related to environmental stress. Continues to be a problem in urban areas. |
| Jack pine decline | Jack pine | Nebraska | Results from a 5-year study indicate that jack pine is no longer declining on the Nebraska National Forest. |
| Leaf scorch | Hardwoods | South Dakota | Due to a wet spring followed by very hot, dry weather from mid-June to late September. Largest single cause of requests for assistance from landowners this year. |
| Ponderosa pine mortality | Ponderosa pine | South Dakota | Mortality on an extensive area of the Harney Ranger District, Black Hills National Forest; cause not confirmed. |

Rocky Mountain Region (R-2)--continued

| Disease | Host | Location | Remarks |
|---|---|---|---|
| Spruce decline | Spruce | Eastern South Dakota | For the past few years, an unknown decline of ornamental spruce has been noted. The decline results in early casting of needles, which begins on a few branches, then eventually spreading over the entire tree. No mortality noted. |
| Other | | | |
| Hazard trees | All species | Regionwide | A survey of 54 fee campgrounds, which examined 7,300 trees, was undertaken this year. Data are being analyzed. |
| Yellow-bellied sapsucker *Sphyrapicus varius* | Pine, juniper, spruce | South Dakota | Numerous reports throughout South Dakota. Light to heavy damage on individual trees and throughout shelterbelts. In one shelterbelt near Chamberlain, 25 spruce sustained heavy damage. |

Southwestern Region (R-3)

Status of insects in Arizona, New Mexico, and Park Service land in western Texas.

| Insect | Host | Location | Remarks |
|---|---|---|---|
| Douglas-fir beetle<br>*Dendroctonus pseudotsugae* | Douglas-fir | Arizona,<br>New Mexico | Scattered single tree and small group mortality occurred throughout the Region. A few areas of concentrated mortality occurred on the Fort Apache Indian Reservation. |
| Large aspen tortrix<br>*Choristoneura conflictana* | Aspen | Arizona,<br>New Mexico | Aspen defoliation attributed to this insect occurred primarily on the Carson National Forest. |
| Mountain pine beetle<br>*Dendroctonus ponderosae* | Ponderosa pine | Arizona,<br>New Mexico | Small areas of mortality were observed on the Kaibab and Carson National Forests and the Navajo and Jicarilla Apache Indian Reservations. In Arizona, 1,610 acres were infested; 690 acres were infested in New Mexico. |
| Pandora moth<br>*Coloradia pandora* | Ponderosa pine | Arizona | Approximately 28,500 acres of defoliation were apparent on the North Kaibab Ranger District, Kaibab National Forest. Intensity of defoliation was less than in previous years. The population is considered in decline. |
| Pine engraver beetles<br>*Ips* spp. | Pines | Arizona,<br>New Mexico | *Ips* activity within the Region was generally at a low level. Concentrated tree mortality was limited to a few areas on the Apache-Sitgreaves National Forest and San Carlos Indian Reservation. |
| Spruce beetle<br>*Dendroctonus rufipennis* | Engelmann spruce | Arizona,<br>New Mexico | Spruce beetle continued at epidemic levels on the Fort Apache Indian Reservation and the Pecos and Las Vegas Ranger Districts of the Santa Fe National Forest. On the Fort Apache Indian Reservation, volume losses have thus far exceeded 100 million board feet as a result of this current outbreak. |
| True fir bark beetles<br>*Dryocoetes confusus*<br>*Scolytus* spp. | True firs | Arizona,<br>New Mexico | Tree mortality attributed to these insects was widespread throughout the Region. Mortality generally occurred in small groups of 1 to 10 trees in the mixed conifer and spruce-fir forest types. |

Southwestern Region (R-3)--continued

| Insect | Host | Location | Remarks |
|---|---|---|---|
| Western pine beetle *Dendroctonus brevicomis* | Ponderosa pine | Arizona, New Mexico | Widely scattered ponderosa pine mortality was caused by this insect throughout the Region. |
| Western spruce budworm *Choristoneura occidentalis* | Douglas-fir, white fir, spruce | Arizona, New Mexico | Defoliation occurred on 371,549 acres in 1983. Defoliation was concentrated on the Carson, Santa Fe, Lincoln, Kaibab, and Cibola National Forests. The Lincoln National Forest experienced the greatest increase in defoliation. In Arizona, about 20,000 acres were infested; in New Mexico, about 352,000 acres were infested. |
| Western tent caterpillar *Malacosoma californicum* | Aspen | Arizona, New Mexico | Defoliation caused by this insect was concentrated on the Santa Fe and Carson National Forests and the Grand Canyon National Park. |

Southwestern Region (R-3)

Status of diseases in Arizona, New Mexico, and Park Service land in western Texas.

| Disease | Host | Location | Remarks |
|---|---|---|---|
| Stem and Branch | | | |
| Dasyscypha canker<br>*Dasyscypha* sp. | Ponderosa pine | Central Arizona | A canker-causing fungus, tentatively identified as *Dasyscypha*, caused mortality, top-kill, and branch dieback on pine seedlings and saplings, Promontory Butte. |
| Dwarf mistletoes<br>*Arceuthobium* spp. | Ponderosa pine, Douglas-fir, Engelmann spruce | Arizona, New Mexico | Dwarf mistletoes continued to have a major impact on growth and yield of conifers in the Southwest. |
| Limb rust<br>*Peridermium filamentosum* | Ponderosa pine | Arizona | Reported causing branch mortality in two areas on the Fort Apache Indian Reservation. |
| Root Disease | | | |
| Annosus root rot<br>*Heterobasidion annosum* | Conifers | Arizona, New Mexico | Found in all timber types but most common in spruce-fir. Like *A. mellea*, *H. annosum* causes mortality as part of a pest complex. |
| Shoestring root rot<br>*Armillaria mellea* | Conifers, aspen | Arizona, New Mexico | The most common and ubiquitous root disease in the Region. It causes mortality in all timber types, usually as part of a complex that includes dwarf mistletoes and bark beetles. Most common in spruce-fir type. Found causing windthrow and mortality in aspen on the Las Vegas Ranger District, Santa Fe National Forest. |
| Foliage Disease | | | |
| Elytroderma disease<br>*Elytroderma deformans* | Ponderosa pine | Arizona, New Mexico | Increased levels of infection and damage were reported from near Lake Mary, Coconino National Forest, and on the Mount Taylor Ranger District, Cibola National Forest. Incidence of all foliage disease increased this year. |
| Needle cast diseases<br>*Lophodermella* spp. | Ponderosa pine | New Mexico | Reported from El Rito Ranger District, Carson National Forest. |

Southwestern Region (R-3)--continued

| Disease | Host | Location | Remarks |
|---|---|---|---|
| Nursery Disease | | | |
| Damping-off<br>*Fusarium* spp.<br>*Rhizoctonia* spp. | Ponderosa pine | New Mexico | Postemergence damping-off caused significant losses at the Albuquerque Tree Nursery. |
| Sirococcus tip blight<br>*Sirococcus strobilinus* | Ponderosa pine | Arizona | Caused mortality and damage to seedlings in a Bureau of Indian Affairs greenhouse, Fort Apache Indian Reservation. |

Intermountain Region (R-4)

Status of insects in southern Idaho, Nevada, Utah, and western Wyoming.

| Insect | Host | Location | Remarks |
|---|---|---|---|
| A pyralid moth | Engelmann spruce | Idaho | No activity was noted this year following widespread seedling losses at the Lucky Peak Nursery in 1982. |
| Douglas-fir beetle *Dendroctonus pseudotsugae* | Douglas-fir | Idaho, Utah, Wyoming | Large pockets of Douglas-fir mortality occurred on the Bridger-Teton, Boise, and Manti-LaSal National Forests. Other areas of beetle activity remained static. |
| Douglas-fir tussock moth *Orgyia pseudotsugata* | Douglas-fir | Idaho | Defoliation occurred on approximately 14,200 acres in the Owyhee Mountains. |
| Larch casebearer *Coleophora laricella* | Western larch | Idaho | Only limited ground observations. |
| Mountain pine beetle *Dendroctonus ponderosae* | Lodgepole pine, ponderosa pine, other pines | Idaho | Mountain pine beetle killed approximately 1.4 million trees in 1983. Beetle populations increased on the Caribou, Challis, and Salmon National Forests. A major epidemic continues to cause extensive mortality to the Ashley and Wasatch National Forests in northeastern Utah. |
| Pine butterfly *Neophasia menapia* | Ponderosa pine | Idaho | Moderate to heavy defoliation over 16,280 acres on the Boise and Salmon National Forests and private lands east of Cascade Reservoir. |
| Pine engraver beetle *Ips pini* | Pines | Idaho | Fewer than 1,000 trees were killed on the Boise, Payette, and Salmon National Forests. This constitutes a downward trend over 1982 levels. |
| Pine needle sheathminer *Zelleria haimbachi* | Lodgepole pine | Idaho | Over 800 acres of lodgepole pine were defoliated on the Caribou and Targhee National Forests. |
| Spruce beetle *Dendroctonus rufipennis* | Engelmann spruce | Idaho, Utah | Localized pockets continue to cause mortality on the Uinta and Manti-LaSal National Forests. Only limited numbers noted in windthrow on the Payette National Forest. |
| Sugar pine tortrix *Choristoneura lambertiana* | Pines | Idaho | New foliage of scattered sapling- and pole-sized pines defoliated. |

Intermountain Region (R-4)--continued

| Insect | Host | Location | Remarks |
|---|---|---|---|
| Western pine beetle *Dendroctonus brevicomis* | Ponderosa pine | Idaho, Nevada | Low levels throughout Region. |
| Western pine shoot borer *Eucosma sonomana* | Ponderosa pine | Idaho | Limited number noted throughout southern Idaho. |
| Western spruce budworm *Choristoneura occidentalis* | Firs, Douglas-fir, western larch, spruce | Idaho | Approximately 2.8 million acres were defoliated in 1983. Infestations expanded on the Bridger-Teton, Boise, Manti-LaSal, Payette, Sawtooth, Targhee, and Wasatch National Forests. |
| Western tussock moth *Orgyia vetusta gulosa* | Willows, *Ceanothus* | Idaho | Defoliation was insignificant in 1983. |

Intermountain Region (R-4)

Status of diseases in southern Idaho, Nevada, Utah, and western Wyoming.

| Disease | Host | Location | Remarks |
|---|---|---|---|
| Stem and Branch | | | |
| Comandra blister rust *Cronartium comandrae* | Lodgepole pine, ponderosa pine | Idaho, Utah, Wyoming | Caused top-kill to lodgepole pine in eastern Idaho, northern Utah, and western Wyoming. |
| Cytospora canker *Cytospora chrysosperma* | Aspen | Idaho | Caused branch mortality to mature aspen in southern Idaho. |
| Dasyscypha canker *Dasyscypha* sp. | Ponderosa pine | Idaho | Found infecting snow-damaged pine regeneration on the Boise National Forest. |
| Dwarf mistletoes *Arceuthobium* spp. | Douglas-fir, ponderosa pine, lodgepole pine, Jeffrey pine, western larch | Idaho, Nevada, Utah, Wyoming | These pests continued to have significant impacts on growth and yield of their host species. Suppression projects removed infected overstory trees from 3,042 acres throughout the Region. |
| False tinder fungus *Phellinus tremulae* | Aspen | Idaho, Nevada, Utah, Wyoming | Prevalent on the Sawtooth National Forest. Also detected in most aspen stands throughout the Region. |
| Fir broom rust *Melampsorella caryophyllacearum* | Subalpine fir | Idaho, Utah, Wyoming | Scattered incidence throughout host type. |
| Indian paint fungus *Echinodontium tinctorium* | Grand fir | Idaho | Static in old-growth stands. |
| Spruce broom rust *Chrysomyxa arctostaphyli* | Engelmann spruce | Idaho, Utah | Scattered incidence throughout host type. |
| Stalactiform rust *Cronartium coleosporioides* | Lodgepole pine | Idaho, Utah | Scattered in host type in south-central Idaho and northern Utah. Notable along North Fork, Trinity Creek, Boise National Forest. |
| Western gall rust *Endocronartium harknessii* | Lodgepole pine, ponderosa pine | Idaho | Static in host type. |
| Root Disease | | | |
| Annosus root rot *Heterobasidion annosum* | Ponderosa pine, Douglas-fir, spruce, true firs | Idaho | Detections of *H. annosum* infections increased throughout southern Idaho. |
| Red-brown butt rot *Phaeolus schweinitzii* | Douglas-fir | Idaho | Usually found in stands over 120 years old that have windthrow or bark beetle activity. |

Intermountain Region (R-4)--continued

| Disease | Host | Location | Remarks |
|---|---|---|---|
| Red ring rot<br>*Phellinus pini* | Firs, pines, Douglas-fir, spruce, western larch | Idaho, Utah | Along with *H. annosum*, infected roots and butts of hosts in southwestern Idaho. Found on spruce in southern Utah. |
| Shoestring root rot<br>*Armillaria mellea* | Grand fir, Douglas-fir, ponderosa pine, lodgepole pine | Idaho, Utah | Found on mature grand fir and Douglas-fir, but pathogenicity is uncertain. Found killing young ponderosa pine on the Boise National Forest. Found on mountain pine beetle-killed lodgepole pine on the Wasatch National Forest. |
| Foliage Disease | | | |
| Dothistroma needle blight<br>*Dothistroma pini* | Ponderosa pine | Idaho | Severe on pine in only known occurrence in Idaho (confluence of Lightning Creek and Middle Fork, Weiser River). |
| Elytroderma disease<br>*Elytroderma deformans* | Ponderosa pine | Idaho | High levels sustained from 1982 infection levels, especially Mores Creek on the Boise National Forest. |
| Fir needle rust<br>*Pucciniastrum* spp. | Firs | Idaho | Light levels of infection in southwestern Idaho. |
| Ink spot<br>*Ciborinia whetzelii* | Aspen | Idaho | Continued infections on Boise and Targhee National Forests. |
| Lodgepole pine needle cast<br>*Lophodermella concolor* | Lodgepole pine | Idaho | Light levels of infection throughout southern Idaho. |
| Marssonina blight<br>*Marssonina populi* | Aspen | Idaho, Wyoming | Scattered incidence throughout host type. |
| Meria needle disease<br>*Meria laricis* | Western larch | Idaho | Very low levels of discoloration and defoliation on Boise and Payette National Forests. |
| Pine needle rust<br>*Coleosporium asterum* | Lodgepole pine | Idaho | Rust infections found on lodgepole pine regeneration on Targhee National Forest. |
| Rhabdocline needle blight<br>*Rhabdocline pseudotsugae* | Douglas-fir | Idaho | Scattered incidence throughout host type. |
| Vascular Wilt | | | |
| Dutch elm disease<br>*Ceratocystis ulmi* | American elm | Idaho, Utah | Continued infections in Boise, Idaho, and in Utah along the Wasatch Front. |

Pacific Southwest Region (R-5)

Status of insects in California, Hawaii, Guam, and the Commonwealth of the Northern Mariana Islands.

| Insect | Host | Location | Remarks |
|---|---|---|---|
| A mealybug *Maconellicoccus hirsutus* | Hibiscus | Hawaii, island of Oahu | New introduction found in 1983 and is a threat to native Malvaceae. |
| A western spruce budworm *Choristoneura carnana californica* | Douglas-fir | Northern California | The extent of the infestation at Trinity Lake increased threefold to 90,000 acres in 1983. Heavy, moderate, and light defoliation intensities made up 73 percent, 4 percent, and 23 percent of the area, respectively. Egg mass counts were approximately 1:1, new to old, indicating a stabilized population over much of the area. |
| Black pineleaf scale *Nuculaspis californica* | Pines | Northern California | About 1,800 acres of ponderosa pine were infested near Burney in Shasta County. Pines on one-half of this area were heavily defoliated, retaining only 1 to 2 years' complement of needles. Western pine beetles caused one small group kill in the most severely damaged stand. |
| Black twig borer *Xylosandrus compactus* | Podocarpus | Hawaii, island of Kauai | Light damage to nursery plantings occurred in Lihue. |
| California flatheaded borer *Melanophila californica* | Pines | Southern California | Generally low levels. |
| Chinese rose beetle *Adoretus sinicus* | Arboretum trees | Guam | Defoliation noted in an arboretum. |
| Douglas-fir tussock moth *Orgyia pseudotsugata* | White fir | Northern and central California | No defoliation was detected. Pheromone trap monitoring of the 1983 moth flight indicated that populations should remain at nondamaging levels in 1984 in the Sierra Nevada and Cascade Range. |
| 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 Region. |
| Flatheaded fir borer *Melanophila drummondi* | Douglas-fir | Northern California | A downward trend in activity. |

Pacific Southwest Region (R-5)--continued

| Insect | Host | Location | Remarks |
|---|---|---|---|
| Fruit piercing moth *Othreis fullonia* | Guava | Guam | Severe damage to guava fruits on trees in the Plant Industry Division's nursery. |
| Fruittree leafroller *Archips argyrospilus* | California black oak, other hardwoods | Southern California | Defoliation was observed over about 14,500 acres in areas between Sugarpine Mountain-Silverwood Lake and Running Springs, San Bernardino National Forest. In 1982, only 2,000 acres were reported defoliated. More than 90 percent defoliation was observed on scattered individual trees and in localized areas covering an estimated 2,000 acres. Egg mass counts indicated that 1984 defoliation levels should be about the same or somewhat higher than 1983 levels. About 2,500 acres of defoliation was also observed in four other locations in the southern Sierra Nevada and San Gabriel Mountains. |
| Grasshoppers *Melanoplus* spp. | Ponderosa pine | Northern California | On the Stanislaus National Forest at McCormick Meadows, grasshoppers ruined 140 acres of new plantations. Abundant populations were present on 1,500 acres in the Granite Burn. |
| Gypsy moth *Lymantria dispar* | Hardwoods, ornamentals | California | In 1982, 104 male gypsy moths were caught in 14 counties; in 1983, 173 male gypsy moths were caught in 16 counties. About 70 percent of the 1983 captures were made at three locations: San Diego (San Diego County), San Jose (Santa Clara County), and Danville (Contra Costa County). |
| Jeffrey pine beetle *Dendroctonus jeffreyi* | Jeffrey pine | California | Localized outbreaks occurred at Big Bear Lake, Truckee, Markleville, Lake Tahoe Basin, and north of Lassen Volcanic National Park. Collectively, these areas totaled about 2,500 acres. |
| Jeffrey pine needleminer *Coleotechnites* sp. | Jeffrey pine | Southern California | Defoliation in the San Bernardino Mountains continued at about the same levels as in 1981 and 1982: approximately 2,000 to 3,000 acres. |
| Lodgepole needleminer *Coleotechnites milleri* | Lodgepole pine | Yosemite National Park | Observations of population levels indicate that the current outbreak, which began in 1973, may be waning and will not cause visible defoliation by 1985. Defoliation was evident on 59,740 acres of host type. |

Pacific Southwest Region (R-5)--continued

| Insect | Host | Location | Remarks |
|---|---|---|---|
| Melon fly<br>*Dacus cucurbitae* | Citrus | Northern Mariana Islands | Population increasing slowly following reintroduction on Rota. |
| Modoc budworm<br>*Choristoneura viridis* | White fir | Northeastern California | For the first time in many years, light feeding on current year's needles and some bud injury were observed in the northern Warner Mountains. |
| Mountain pine beetle<br>*Dendroctonus ponderosae* | Sugar pine, ponderosa pine, lodgepole pine | Northern and central California | An increase in lodgepole pine mortality became apparent by mid-summer over some 10,000 acres in Yosemite National Park, several hundred acres in Lake Tahoe Basin, at Trout Creek north of Truckee, and in Donner Memorial Park. |
| Pandora moth<br>*Coloradia pandora* | Jeffrey pine | Southern California | First reported in 1979 and eventually covering 16,000 acres in 1981, the outbreak on the Mammoth Ranger District, Inyo National Forest, subsided in 1983. Close monitoring documented the natural factors, principally a virus-caused disease, that caused the population collapse. |
| Pine engraver beetles<br>*Ips* spp. | Pines | California | Pine engraver activity increased in 1983. Damage was widespread and highly visible from Nevada County south through the Sierra Nevada and in the mountains of southern California. Most of the reported activity was associated with untreated slash and storm or fire damage. |
| Pine needle sheathminer<br>*Zelleria haimbachi* | Ponderosa pine | Northern California | Defoliation was observed at numerous locations in plantation and natural stands of pine. In the aggregate, defoliation probably totaled 1,000 to 2,000 acres. After 3 years of defoliation, some plantation ponderosa pines remained undamaged, while other pines had serious top damage and were liable to develop poor form. |
| Poinciana looper<br>*Pericyma cruegeri* | Flame tree | Northern Mariana Islands, Guam | 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. |

Pacific Southwest Region (R-5)--continued

| Insect | Host | Location | Remarks |
|---|---|---|---|
| Red turpentine beetle *Dendroctonus valens* | Pines | California | Generally low levels throughout the Region. The exception was in stands underburned for fuels reduction. Here, activity was elevated, but little tree mortality was observed. |
| Spiraling whitefly *Aleurodicus dispersus* | Ornamentals, shade, and fruit trees; native and exotic forest trees | Hawaii, Northern Mariana Islands, Guam | Populations in Hawaii remain in check since the release of several biological control agents, notably *Nephaspis amnicola* Wingo and *Encarsia* spp. Occasional outbreaks occur; however, they are short lived. Introduced to Saipan in 1983. Populations increasing throughout the islands. In Guam, prompt introduction of natural enemies has helped check spread. |
| Tangan tangan mealybug *Nipaecoccus vastator* | Tangan tangan | Northern Mariana Islands, Guam | Population remains at endemic level on Saipan and Tinian. No major outbreaks in 1983 on Guam. |
| Tent caterpillar *Malacosoma* sp. | Bitterbrush | Eastern California | Defoliation occurred over two grazing allotments (1,500 acres) on the Inyo National Forest, and egg mass counts indicate populations will remain high or increase in 1984. |
| Western pine beetle *Dendroctonus brevicomis* | Ponderosa pine, Coulter pine | California | Generally low levels throughout the Region. |

Pacific Southwest Region (R-5)

Status of diseases in California, Hawaii, Guam, and the Commonwealth of the Northern Mariana Islands.

| Disease | Host | Location | Remarks |
|---|---|---|---|
| Stem and Branch | | | |
| Diplodia tip blight *Diplodia pinea* | Pines | Hawaii, island of Molokai | Despite improved growing conditions, dieback continued on 290 acres. |
| Dwarf mistletoes *Arceuthobium* spp. | Ponderosa pine, Jeffrey pine, true firs, other conifers | California | Dwarf mistletoes infected conifers on some 2.2 million acres of commercial forest land in California. |
| Butt rot *Phellinus* sp. | Ironwood | Hawaii | A newly discovered butt rot that apparently has existed for many years in Hawaii. Disease is found mainly at low elevations, and incidence is low. |
| True mistletoes *Phoradendron* spp. | Hardwoods, white fir | Southern California | Widespread infection of hardwoods in high-use recreation areas. |
| White pine blister rust *Cronartium ribicola* | Sugar pine | Northern and central California | New infections were found on the Sequoia and Sierra National Forests as the disease spread and intensified in the southern Sierra Nevada. |
| Root Disease | | | |
| Annosus root rot *Heterobasidion annosum* | Conifers | California | One of the principal root diseases in California; affected true firs on some 500,000 acres in northern California. |
| Black stain root disease *Ceratocystis wageneri* | Douglas-fir, pines | Northern and central California | New reports of the disease continued to expand its known range in the Coast Range and in the Sierra Nevada. Numerous disease centers were reported on 2,000 acres of pinyon pine near Chimney Peak, Tulare County. |
| Flame tree root disease *Phellinus noxius* | Flame tree | Northern Mariana Islands | Caused mortality on Rota in localized areas. Less host-specific and more scattered on Saipan. |
| Laminated root rot *Phellinus weirii* | Douglas-fir | Northern California | The disease was found in a 5-acre stand near Willow Creek, Humboldt County. |
| Phytophthora root rot *Phytophthora lateralis* | Port-Orford-cedar | Northern California | Several new infection centers were found in the Smith River watershed. |

Pacific Southwest Region (R-5)--continued

| Disease | Host | Location | Remarks |
|---|---|---|---|
| Foliage Disease | | | |
| Acacia rust<br>*Uromyces digitatus* | Koa,<br>koaia | Hawaii | Widespread on most islands, but losses are minimal. |
| Acacia rust<br>*Uromyces koae* | Koa | Hawaii | Widespread; reduced growth of young koa. |
| Elytroderma disease<br>*Elytroderma deformans* | Ponderosa pine,<br>Jeffrey pine | Northern and central California | An increase in disease was reported from the San Bernardino National Forest in southern California. |
| White fir needle cast<br>*Lirula abietis-concoloris*<br>*Virgella robusta* | White fir | Northern and central California | These similar needle cast fungi caused an increased amount of defoliation throughout the Sierra Nevada. |
| Vascular Wilt | | | |
| Dutch elm disease<br>*Ceratocystis ulmi* | Elms | Central California | Disease still confined to eight counties; one new diseased tree was found in Alameda County, which had been free of disease since 1979. Incidence of new infections remained at continuous low levels. |
| Nursery Disease | | | |
| Fusarium root disease<br>*Fusarium oxysporum* | Pines,<br>Douglas-fir,<br>true firs | Northern California | A major disease problem at the Magelia Nursery; affected Douglas-fir, white fir, red fir, and ponderosa pine. |
| Phoma blight<br>*Phoma* sp. | Douglas-fir,<br>red fir,<br>white fir | Northern California | At the Humboldt Nursery, needle blight caused a 23 percent loss of Douglas-fir, and a tip blight and canker problem caused a 75 percent loss of 1-0 red fir and a 15 percent loss of 1-0 white fir. |
| Abiotic | | | |
| Air pollution | Ponderosa pine,<br>Jeffrey pine | Central and southern California | Slight-to-moderate ozone injury was reported as far north as the Tahoe National Forest in the central Sierra Nevada. |

Pacific Northwest Region (R-6)

Status of insects in Oregon and Washington.

| Insect | Host | Location | Remarks |
|---|---|---|---|
| Douglas-fir beetle *Dendroctonus pseudotsugae* | Douglas-fir | Oregon, Washington | East of the Cascade Range, Douglas-fir beetle damage was up slightly. Current damage levels are still far below what they were in the 1970's. The greatest damage in 1983 was in the Snake River area on the Wallowa-Whitman National Forest. Losses in Douglas-fir were 15,110 acres (443.460 thousand cubic feet) east of the Cascades and 2,110 acres (126.430 thousand cubic feet) west of the Cascades. |
| Douglas-fir tussock moth *Orgyia pseudotsugata* | Douglas-fir, true firs | Oregon, Washington | In 1982 and early 1983, Douglas-fir tussock moth populations continued to increase throughout northeast and north-central Washington. Light to heavy defoliation was found on 17,090 acres of Douglas-fir in Ferry, Stevens, and Okanogan Counties, Wash. Most damage was on State and private lands in the upper Sandpoint and upper Curlew River drainages in Ferry County. In Oregon, 10 acres of light defoliation appeared north of La Grande on private lands adjacent to the Wallowa-Whitman National Forest. By moth flight in the fall of 1983, population collapse was evident: The capture rates of male tussock moth indicate a general decline in the tussock moth population throughout eastern Washington and Oregon. Fall egg mass surveys in north-central Washington also confirmed population collapse. Population collapse has also occurred in the small Oregon outbreak. |
| Fir engraver *Scolytus ventralis* | True firs | Oregon, Washington | A substantial increase in fir engraver activity was noted in the true fir stands on the Fremont, Rogue River, and Winema National Forests in Oregon. Losses remain static in Washington. Most of the fir engraver damage occurred on sites infected with either laminated root rot (*Phellinus weirii*), shoestring root rot (*Armillaria mellea*), or annosus root rot (*Fomes annosus*), which weaken true firs, making them susceptible to beetle attacks. Losses occurred on 23,490 acres (1,217.810 thousand cubic feet). |

Pacific Northwest Region (R-6)--continued

| Insect | Host | Location | Remarks |
|---|---|---|---|
| Modoc budworm *Choristoneura viridis* | Douglas-fir, true firs | Southern Oregon | Modoc budworm defoliation increased in southern Oregon in true fir stands on the Fremont and Winema National Forests. Total acres of visible defoliation increased from 4,950 in 1982 to 126,610 in 1983. Results of the fall 1983 egg mass survey indicate continued defoliation in 1984. |
| Mountain pine beetle *Dendroctonus ponderosae* | Lodgepole pine, ponderosa pine, western white pine, other pines | Oregon, Washington | Losses continued about the same in Washington, but intensified in Oregon. From 1982 to 1983, lodgepole pine losses increased fourfold on the Deschutes National Forest. Losses in lodgepole pine stands on the Fremont and Winema National Forests increased 100 percent. Losses on the Wallowa-Whitman, Malheur, and Umatilla National Forests continue to decrease, primarily because most suitable host trees have already been killed. The 1983 mountain pine beetle losses include 1,092,000 acres (57,483.760 thousand cubic feet) of lodgepole pine, 131,600 acres (3,779.770 thousand cubic feet) of ponderosa pine, 47,300 acres (1,461.750 thousand cubic feet) of western white pine, and about 5,000 acres of various other pines. Intense losses are expected to continue in south-central Oregon and decrease in the rest of the Region. |
| Pine engraver beetles *Ips* spp. | Ponderosa pine | Oregon, Washington | Activity of the pine engraver, or *Ips*, continues at a low level. Again, most of the activity was on the Fremont National Forest. Increases were seen on the Colville Indian Reservation and the Umatilla National Forest. Acres infested in 1983 totaled 6,730. |
| Spruce beetle *Dendroctonus rufipennis* | Engelmann spruce | Washington | Spruce beetle activity in Engelmann spruce stands in northeast Washington was very low this year. Losses include 1,350 acres (30.000 thousand cubic feet). |

Pacific Northwest Region (R-6)--continued

| Insect | Host | Location | Remarks |
|---|---|---|---|
| Western pine beetle *Dendroctonus brevicomis* | Ponderosa pine | Oregon, Washington | Tree mortality continued low in Washington but increased about 350 percent in Oregon. Greatest increases occurred on the Deschutes, Winema, and Ochoco National Forests. Some activity has occurred again on all Forests and Indian Reservations within the host range. Losses in 1983 were 908.070 thousand cubic feet. |
| Western spruce budworm *Choristoneura occidentalis* | Douglas-fir, true firs, western larch, Engelmann spruce | Oregon, Washington | In the Pacific Northwest Region, the area of visible defoliation caused by western spruce budworm increased from 1,540,000 acres in 1982 to 2,477,000 acres in 1983. Budworm defoliation was detected on the Mount Hood National Forest in areas not seen since 1952. Budworm defoliation was observed from the ground on the Deschutes National Forest southwest of Bend. Budworm continues to increase on the Malheur, Wallowa-Whitman, Ochoco, and Umatilla National Forests and 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 1983. Results of the fall 1983 egg mass survey indicate a building population in newly defoliated areas and continued defoliation in areas defoliated prior to 1983. |

Pacific Northwest Region (R-6)

Status of diseases in Oregon and Washington.

| Disease | Host | Location | Remarks |
|---|---|---|---|
| Stem and Branch | | | |
| Dwarf mistletoes<br>*Arceuthobium* spp. | Most species | Oregon,<br>Washington | Dwarf mistletoes are all too common pathogens in most of the Pacific Northwest. However, as stand management intensifies, losses due to dwarf mistletoes are declining. Dwarf mistletoes caused an estimated loss of 132.7 million cubic feet of timber in Oregon and Washington in 1983. A model for estimating present volume and projected reductions in yield, along with economic analysis, has been developed for dwarf mistletoe-infected central Oregon lodgepole pine stands. Programs are being written for popular handheld programmable calculators. |
| White pine blister rust<br>*Cronartium ribicola* | Western white pine, sugar pine | Oregon,<br>Washington | White pine blister rust continues to be the most important disease of western white and sugar pines. Annual losses to white pine blister rust in western Oregon are estimated to be 15 million cubic feet. Gains are being made through identification of resistant trees and ratings of sites for infection hazard. Hazard rating programs developed for popular handheld programmable calculators predict the blister rust infection hazard and disease losses for specific sites. Excellent progress was made in 1983 in training people how to use these programs. |
| Stem decay | All species | Oregon,<br>Washington | Stem decay fungi still consume enormous volumes of wood. Although the majority of losses occur in old-growth stands, significant losses are occurring in younger stands as wounding of residual trees during stand entries both activates dormant infections and creates excellent 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. |

Pacific Northwest Region (R-6)--continued

| Disease | Host | Location | Remarks |
|---|---|---|---|
| Root Disease | | | |
| Annosus root rot *Heterobasidion annosum* | True firs, western hemlock | Oregon, Washington | Annosus root rot is responsible for extensive losses in many partially cut white fir stands in southern and eastern Oregon. Most loss is due to outright tree mortality. Losses in hemlock stands can be minimized by wound prevention and rotations of 120 years or less. |
| Black stain root disease *Ceratocystis wageneri* | Douglas-fir | Oregon, Washington | Numerous new findings of black stain root disease have been made in second-growth Douglas-fir stands. In southwestern Oregon, where this is by far the most commonly encountered disease in Douglas-fir plantations, it appears to be especially damaging where stand/soil disturbances have occurred, especially in roadside Douglas-firs cut back by mechanical choppers. Losses are also greater on tractor trailer-logged versus cable-logged sites due to soil compaction. |
| Laminated root rot *Phellinus weirii* | Douglas-fir, true firs | Oregon, Washington | Laminated root rot has removed about 5 percent of the Douglas-fir type west of the Cascades from full production. The acreage of infestation may be closer to 10 percent. Damage is also severe in some grand and white fir stands. |
| Phytophthora root rot *Phytophthora lateralis* | Port-Orford-cedar | Oregon | Phytophthora root rot continues to cause widespread mortality of Port-Orford-cedar in southwestern Oregon. |
| Shoestring root rot *Armillaria mellea* | Conifers | Oregon, Washington | Shoestring root rot continues to appear throughout the Region. The most serious losses to this disease occur east of the Cascades. Serious losses west of the Cascades are usually confined to stressed stands, such as off-site plantings. Direct control through stump and root removal is being practiced in severely infected eastern Washington stands. |

Pacific Northwest Region (R-6)--continued

| Disease | Host | Location | Remarks |
|---|---|---|---|
| Foliage Disease<br>Elytroderma disease<br>*Elytroderma deformans*<br><br>Dothistroma needle blight<br>*Dothistroma pini*<br><br>Rhabdocline needle blight<br>*Rhabdocline pseudotsugae* | Ponderosa pine, lodgepole pine, Douglas-fir | Oregon, Washington | The incidence of several foliage diseases increased substantially in 1983 compared to 1982. Hundreds of thousands of acres of ponderosa and lodgepole pines east of the Cascades were affected by dothistroma needle blight. Elytroderma disease increased dramatically over most of the ponderosa pine range. Douglas-fir in central Oregon was subject to needle casting by rhabdocline needle blight. |

Southern Region (R-8)

Status of insects in Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia.

| Insect | Host | Location | Remarks |
|---|---|---|---|
| A pine needle midge *Contarinia* n. sp. | Loblolly pine | Louisiana | Populations generally were at low levels; however, in one seed orchard, needle drop and defoliation of 84 percent of the ramets occurred. |
| Bagworm *Thyridopteryx ephemeraeformis formis* | Eastern white pine | North Carolina | Moderate defoliation of white pine in the Piedmont. |
| Balsam woolly aphid *Adelges piceae* | Fraser fir | North Carolina, Tennessee | 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 | Florida, Louisiana, Texas | Moderate defoliation in Rapides Parish, La., and on 1,200 acres of the Sam Houston National Forest, Tex. Scattered light to moderate defoliation in Marion County, Fla. |
| Black turpentine beetle *Dendroctonus terebrans* | Southern pines | Mississippi, North Carolina, Virginia | Scattered losses occurred over a 1,500-acre area on the Bienville National Forest, Miss. Moderate activity in North Carolina and Virginia limited to drought-stressed areas. |
| Coneworms *Dioryctria amatella* *Dioryctria clarioralis* *Dioryctria merkeli* | Loblolly pine, slash pine | Southwide | Some seed orchard losses but generally less than 10 percent of the cones were damaged. Some orchards reported moderate to high trap catches of *Dioryctria merkeli*, but damage was low. |
| Eastern tent caterpillar *Malacosoma americanum* | Various hardwoods, especially black cherry | Alabama, Arkansas, Virginia | High population levels and widespread defoliation occurred in Alabama and Arkansas. In Virginia, populations are declining. |
| Elm leaf beetle *Pyrrhalta luteola* | Elm | Mississippi, Oklahoma | Moderate defoliation reported in Claibourne County, Miss. Problems in urban areas throughout Oklahoma. |

Southern Region (R-8)--continued

| Insect | Host | Location | Remarks |
|---|---|---|---|
| Fall webworm<br>*Hyphantria cunea* | Various hardwoods | Alabama, Arkansas, Oklahoma, North Carolina, Virginia | Populations continued to be higher than normal. Widespread infestations caused severe defoliation in late summer throughout eastern and central Oklahoma. Moderate to heavy defoliation occurred in Arkansas, Alabama, North Carolina, and Virginia. |
| Forest tent caterpillar<br>*Malacosoma disstria* | Various hardwoods | Alabama, Louisiana, South Carolina | Moderate to heavy defoliation with over 450,000 acres affected in Louisiana. Although usually considered a forest pest, high populations expanded into coastal plain urban areas in South Carolina. |
| Fruittree leafroller<br>*Archips argyrospilus* | Bald cypress | Louisiana | Extensive defoliation over 60,000 acres in the Atchafalya Basin. |
| Gypsy moth<br>*Lymantria dispar* | Various hardwoods | North Carolina, South Carolina, Virginia | The northern tier of counties in Virginia are now considered to be generally infested. Eradication projects have been conducted against isolated infestations in all three States. |
| Introduced pine sawfly<br>*Diprion similis* | Eastern white pine | North Carolina, Tennessee, Virginia | Populations remain at low levels except in North Carolina, where populations are increasing. |
| Loblolly pine sawfly<br>*Neodiprion taedae linearis* | Southern pines | Arkansas, Louisiana | Scattered light defoliation in Louisiana. Heavy damage reported in Dallas, Calhoun, and Independence Counties, Ark. |
| Locust leafminer<br>*Odontata dorsalis* | Black locust | North Carolina, Tennessee, Virginia | Scattered to moderate defoliation. |
| Looper complex:<br>Linden looper<br>*Erannis tiliaria*<br>Eastern oak looper<br>*Phigalia titea*<br>Fall cankerworm<br>*Alsophila pometaria* | Oaks | Virginia | Mortality continued to occur due to past defoliation (1981 and 1982) and severe drought. Spring insect populations were low. Fall cankerworm populations increased in several areas |
| Nantucket pine tip moth<br>*Rhyacionia frustrana*<br>Pitch pine tip moth<br>*Rhyacionia rigidana* | Loblolly pine, shortleaf pine | Alabama, Arkansas, Louisiana, Mississippi, Texas | High populations throughout Arkansas, particularly on shortleaf pine. Virginia pine in Christmas tree plantations has been damaged. |

Southern Region (R-8)--continued

| Insect | Host | Location | Remarks |
|---|---|---|---|
| Pine cone borers<br>*Eucosma* spp. | Eastern white pine,<br>shortleaf pine | North Carolina | Low-level populations in seed orchards. |
| Pine engraver beetles<br>*Ips* spp. | Southern pines | Alabama,<br>Arkansas,<br>Louisiana,<br>Mississippi,<br>North Carolina,<br>Texas,<br>Virginia | A large population buildup occurred in storm-damaged timber on the Ouachita, Sam Houston, and Kisatchie National Forests. Little damage occurred to adjacent standing timber. Some populations have been intermixed with southern pine beetle. Moderate levels of activity were observed in drought-stressed regions of North Carolina and Virginia. |
| Pine webworm<br>*Tetralopha robustella* | Southern pines | Arkansas | Scattered severe defoliation in regeneration areas. |
| Redheaded pine sawfly<br>*Neodiprion lecontei* | Southern pines | Arkansas,<br>Florida | Several small infestations in Drew County, Ark. On Ocala National Forest in Florida, high tree mortality in some areas due to repeated defoliation. |
| Reproduction weevils<br>*Hylobius pales*<br>*Pachylobius picivorus* | Southern pines | Oklahoma | Scattered losses occurred in regeneration areas. |
| Scales<br>*Toumeyella* sp.<br>*Pseudophilippia quaintancii* | Southern pines | Louisiana,<br>Texas | Several orchards have experienced outbreaks of scale complexes. No reductions in flower set have been documented. |
| Seedbugs<br>*Leptoglossus corculus*<br>*Tetyra bipunctata* | Southern pines | North Carolina | Populations building in many untreated orchards. High populations in untreated blocks at the Forest Service Beech Creek Seed Orchard caused extensive damage. |
| Slash pine thrips<br>*Gnophothrips fuscus* | Slash pine | Gulf Coast | Flower mortality variable between orchards. |
| Southern pine beetle<br>*Dendroctonus frontalis* | Southern pines | Alabama,<br>Arkansas,<br>Florida,<br>Georgia,<br>Louisiana,<br>Mississippi,<br>North Carolina,<br>South Carolina,<br>Texas,<br>Virginia | Sixty-six counties in eight States reported outbreak conditions. The Chattahoochee-Oconee National Forest in Georgia; the Francis Marion National Forest in South Carolina; the Ouachita in Arkansas; and the National Forests in Mississippi and Texas all had outbreak levels of southern pine beetle. |

Southern Region (R-8)--continued

| Insect | Host | Location | Remarks |
|---|---|---|---|
| Texas leafcutting ant *Atta texana* | Southern pines | Louisiana, Texas | Serious losses of pine regeneration on deep, sandy soils. |
| Virginia pine sawfly *Neodiprion pratti pratti* | Virginia pine, loblolly pine, shortleaf pine, pitch pine | North Carolina, Tennessee, Virginia | Defoliation very heavy in Patrick County, Va. Light infestations in Tennessee and North Carolina. |
| Walnut caterpillar *Datana integerrima* | Water hickory, sweet pecan, black walnut, pecan | Mississippi, Oklahoma | Heavy defoliation over 25,000 acres in the Delta Region of Mississippi. |
| Webbing coneworm *Dioryctria disclusa* | Loblolly pine | Alabama, Georgia, Mississippi, North Carolina, South Carolina, Tennessee, Virginia | Populations collapsed as evidenced by low pheromone trap catches; few pine seed orchards reported any damage. |
| Whitemarked tussock moth *Orgyia leucostigma* | Live oak, water oak, laurel oak, various ornamentals | South Carolina | Approximately 600 acres in Beaufort County were successfully treated. |
| White pine aphid *Cinara strobi* | Eastern white pine | North Carolina, Virginia | Locally heavy populations causing top and branch dieback. |
| White pine cone beetle *Conophthorus coniperda* | Eastern white pine | North Carolina | Low-level populations in seed orchards. Damage was less than 5 percent. |

Southern Region (R-8)

Status of diseases in Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia.

| Disease | Host | Location | Remarks |
|---|---|---|---|
| Stem and Branch | | | |
| Chestnut blight<br>*Endothia parasitica* | American chestnuts and hybrids | Throughout host range | Hypovirulence being tested in several areas. Virginia is attempting to hold valuable stock with inoculations of hypovirulent strains. |
| Diplodia tip blight<br>*Diplodia* sp. | Austrian pine | Oklahoma | Common in urban areas in the central portion of the State; common in shelterbelts in rural areas. |
| Fusiform rust<br>*Cronartium quercuum* f. sp. *fusiforme* | Slash pine, loblolly pine | Throughout host range | Continues to be the most severe and economically significant disease of pine in the South. |
| Hypoxylon canker<br>*Hypoxylon atropunctatum* | Red oaks | Southwide | Common on stressed or weakened trees in urban and forest environments. |
| Pitch canker<br>*Fusarium moniliforme* var. *subglutinans* | Slash pine, loblolly pine, longleaf pine, shortleaf pine, Virginia pine | Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, Oklahoma, Texas | Seed orchards continue to sustain sporadic damage, which in most cases follows clonal lines. The most severe cases were on Virginia pine in Alabama, longleaf pine in Louisiana, and loblolly pine in North Carolina. |
| Stem decay<br>Basidiomycetes | All species, especially hardwoods | Southwide | Will continue to be a problem in stands with severe fire history. |
| White pine blister rust<br>*Cronartium ribicola* | Eastern white pine | North Carolina, Virginia | Sanitation inspections continue on proposed planting sites. |
| White pine decline<br>*Verticicladiella procera* | Eastern white pine | Kentucky, North Carolina, Tennessee, Virginia | Frequent occurrence in urban plantings under stress. Also a common problem in seed orchards with root injury. |
| Root Disease | | | |
| Annosus root rot<br>*Heterobasidion annosum* | Southern pines | Southwide | Still the most serious root rot problem in the South, damaging thinned stands and shade trees. A major problem in a white pine and loblolly pine seed orchard. Major areas of infection have been identified in Alabama and Texas. |
| Ganoderma root rot<br>*Ganoderma tsugae*<br>*Ganoderma lucidum* | Loblolly pine, oaks | Alabama, Mississippi, Louisiana | Continued to be active on "droughty" sites. |

Southern Region (R-8)--continued

| Disease | Host | Location | Remarks |
|---|---|---|---|
| Littleleaf disease<br>*Phytophthora cinnamomi* | Shortleaf pine, loblolly pine | Alabama, Georgia, Kentucky, North Carolina, South Carolina, Tennessee | Continued common occurrence on heavy soils in stands of shortleaf pine in the Piedmont. May predispose trees to southern pine beetle attack. |
| Root rot complex<br>*Fusarium solani*<br>*Fusarium moniliforme* | Sand pine | Florida | New host report. |
| Root rots<br>*Armillaria mellea* | Hardwoods | Southwide | Common in forest stands, especially on stressed or shallow-rooted trees. |
| *Armillaria tabescens* | Pine | | |
| *Phaeolus schweinitzii* | Conifer | | |
| *Phytophthora* sp. | Conifer | | |
| Foliage Disease | | | |
| Brown spot<br>*Scirrhia acicola* | Longleaf pine, slash pine | Alabama, Louisiana, Mississippi, Texas | Light damage in many areas. |
| Dothistroma needle blight<br>*Dothistroma* sp. | Austrian pine | Oklahoma | Common in urban areas and shelterbelts. Less severe than last year. |
| Leaf spots<br>*Sporodesmium* spp. | Live oak, red maple | Florida | New host reports. |
| Melampsora rust<br>*Melampsora medusae* | Poplars | Throughout host range | Caused premature defoliation in small areas. |
| Oak leaf blister<br>*Taphrina caerulescens* | Oaks | Throughout host range | Scattered throughout range but not severe. Most noticeable in urban plantings. |
| Pine needle casts<br>*Lophodermium* spp.<br>*Ploicoderma* sp. | Pines | Southwide | Widespread due to a wet spring. Locally severe, causing partial defoliation of affected trees. Greatest impact on visual quality in parks and Christmas tree plantations. |
| Pine needle rusts<br>*Coleosporium* spp. | Hard pines | Southwide | Slight damage. |
| Sycamore anthracnose<br>*Gnomonia veneta* | American sycamore | Throughout host range | Widespread due to wet spring. Serious defoliation reported along the Mississippi River. |
| Walnut anthracnose<br>*Gnomonia leptostyla* | Black walnut | Throughout host range | Widespread due to wet spring. |

Southern Region (R-8)--continued

| Disease | Host | Location | Remarks |
|---|---|---|---|
| Vascular Wilt | | | |
| Dutch elm disease<br>*Ceratocystis ulmi* | Elms | Throughout host range | Scattered single tree reports. Common along drainages in eastern and central Oklahoma. The first reported incidence in Louisiana: Seven parishes in northern Louisiana reported infections. Infections were also reported in North Carolina. |
| Elm phloem necrosis (elm yellows)<br>Mycoplasmalike organisms | Winged elm | Alabama | Continues to kill scattered single trees or groups of trees in urban setting. |
| Mimosa wilt<br>*Fusarium oxysporum* f. sp. *perniciosum* | Mimosa | Throughout host range | Continues to be a major cause of mortality in ornamental plantings. |
| Oak wilt<br>*Ceratocystis fagacearum* | Oak | Arkansas, North Carolina, Oklahoma, Tennessee, Texas, Virginia | Remains at endemic levels in Arkansas and Oklahoma but is epidemic in central Texas, where 26 counties are affected. Live oaks and Texas red oak are the primary hosts in Texas. |
| Pinewood nematode<br>*Bursaphelenchus xylophilus* | Many pine species, red cedar | Southwide | Concern among seed orchard managers in Tennessee, Florida, and North Carolina. Only minor problems have been reported elsewhere. |
| Verticillium wilt<br>*Verticillium albo-atrum* | Maples | North Carolina | Maples in urban plantings affected. Branch dieback evident. |
| Nursery/Seed Orchard | | | |
| Brown spot<br>*Scirrhia acicola* | Longleaf pine | Georgia | Areas of moderate needle spotting following top pruning. |
| Charcoal root rot<br>*Macrophomina phaseolia* | Loblolly pine | Georgia | Seedbeds had damaged seedlings along bed edges where pines had grown for 2 consecutive years without fumigation. |
| Cyclindrocladium root rot<br>*Cylindrocladium* spp. | Eastern white pine | North Carolina, South Carolina | Scattered mortality in 2-0 seedbeds. |
| Damping-off<br>*Pythium* spp.<br>*Phytophthora* spp.<br>*Fusarium* spp.<br>*Rhizoctonia* spp. | Many species | Southwide | Chronic losses. |

Southern Region (R-8)--continued

| Disease | Host | Location | Remarks |
|---|---|---|---|
| Extreme weather | Loblolly pine, eastern white pine, alder | Kentucky, Tennessee, Virginia | In Virginia, 8,000,000 loblolly seedlings lost to hail; in Kentucky, 200,000 white pine and 50,000 alder seedlings lost to sun scald; in Tennessee, 250,000 seedlings lost. |
| Fusarium root disease *Fusarium* spp. | Loblolly pine | Arkansas, Louisiana, Texas | Highest incidence on poorly drained sites or where chemical injury to roots has occurred. |
| Fusiform rust *Cronartium quercuum* f. sp. *fusiforme* | Slash pine, loblolly pine, longleaf pine | Southwide | Found especially in Gulf and South Atlantic Coast regions. Spray programs generally effective, although specific fungicides differed in overall efficacy. |
| Lack of dormancy | Loblolly pine | Mississippi | About 441,000 seedlings discarded due to poor quality caused by lifting prior to physiological dormancy. |
| Phomopsis blight *Phomopsis juniperovora* | Eastern red cedar | Florida, South Carolina | In Florida, 700,000 seedlings lost. |
| Phytophthora root rot *Phytophthora* spp. | Black walnut | Kentucky, South Carolina, Tennessee | In Kentucky, 25,000 seedlings lost. Control prevented losses in Tennessee. |
| | Loblolly pine | Alabama, Arkansas, Louisiana | Present in nonfumigated areas. |
| Pitch canker *Fusarium moniliforme* var. *subglutinans* | Slash pine, loblolly pine | Florida, Georgia | Seedborne. Low levels in seedbeds. Container nurseries in Florida and Georgia experienced moderate losses. |
| Pythium root rots *Pythium* spp. | Dogwood | Florida | 38,000 seedlings lost. |
| Rhizoctonia needle blight *Rhizoctonia solani* and other species | Longleaf pine | Florida, Georgia, North Carolina, South Carolina | In one Florida nursery, 750,000 seedlings lost. |
| Root decline *Verticicladiella procera* | Loblolly pine, slash pine, shortleaf pine, Virginia pine, Eastern white pine | Alabama | Found in seed orchards. Ultimate effect of this root disease remains unclear. Also a problem in urban plantings. |
| Tip blights *Phomopsis* spp. *Fusarium* spp. | Slash pine, loblolly pine, longleaf pine, sand pine | Louisiana, South Carolina, Texas | Scattered low-level infection in Texas and Louisiana. In South Carolina, 10,000 to 50,000 seedlings culled. |

Southern Region (R-8)--continued

| Disease | Host | Location | Remarks |
|---|---|---|---|
| Walnut anthracnose *Gnomonia leptostyla* | Black walnut | South Carolina | Moderate defoliation in later part of growing season. |
| Abiotic | | | |
| Cold damage | Hardwoods | North Carolina | Damage caused by late spring freeze. |
| Drought-related tree mortality and decline | Oaks, other hardwoods, pines | Southwide | Trees stressed by the droughts of 1981 continued to dieback and die. In oaks, drought-caused decline was followed by attacks by insects and a variety of disease-causing organisms. |
| Needle cast | Eastern white pine | Virginia | Defoliation caused by stress in white pine Christmas tree plantations. |
| Winter kill | Loblolly pine, shortleaf pine | Florida, North Carolina, Tennessee, Virginia | Trees affected in urban plantings, seed orchards, and forest stands. |
| Other | | | |
| Construction damage | All species | Southwide | Urban foresters continue to report severe, localized damage. |
| Hurricane damage | All species | Texas | Extensive area of blowdown between Houston and Hunstville caused by Hurricane Alicia. |
| Mice | Eastern white pine | Virginia | High populations reported in white pine seed orchard. |
| Tornado damage | All species | Arkansas, Louisiana, Texas | Severe damage in three parishes in central Louisiana. In separate storms, severe damage north of Houston occurred. |

Eastern Region (R-9) 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* | Sugar maple, poplar, American beech | Maine, New Hampshire, Vermont | In New Hampshire, light to moderate defoliation occurred on 18,600 acres. About 697 acres of defoliation occurred on the White Mountain National Forest. Vermont had light to moderate defoliation on over 20,000 acres. Populations are expected to increase. Maine had about 338,000 acres of defoliation. |
| Cherry scallop shell moth *Hydria prunivorata* | Black cherry | Michigan, New York, Pennsylvania, West Virginia | About 80,000 acres in Pennsylvania had moderate to heavy defoliation, which resulted in losses of $20 per acre. Populations are continuing to increase. In Michigan, heavy defoliation occurred on 7,820 acres; in West Virginia, populations are increasing in the mountainous areas. In New York, moderate to heavy defoliation occurred on 3,475 acres. |
| Fall webworm *Hyphantria cunea* | Hardwoods | Indiana, Iowa, Maine, Missouri, Pennsylvania, Rhode Island, West Virginia | Pennsylvania and Indiana had roadside and yard trees with two or more webs per tree statewide. Populations are expected to decline in Iowa and to continue at low levels in Maine and Rhode Island. In Missouri, populations were low; damage scattered. The northern panhandle of West Virginia was heavily infested. |
| Forest tent caterpillar *Malacosoma disstria* | Hardwoods | Maine, Maryland, Massachusetts, Michigan, Minnesota, New York, Vermont, Wisconsin | Minnesota had about 168,000 acres of heavy defoliation and 70,000 acres of lighter defoliation. Some stands have now been defoliated for 6 consecutive years and have up to 50 percent mortality. In Michigan, populations collapsed; in Vermont, about 180 acres were defoliated, down from 321,693 acres in 1982. Maine had about 348,000 acres defoliated; Massachusetts had about 135 acres defoliated; populations are growing. In Maryland, the forest tent caterpillar together with the half- wing geometer and fall cankerworm caused some mortality in Allegany County. In New York, light to moderate defoliation occurred on 25,520 acres; 3,500 acres had tree mortality. In Wisconsin, defoliation on nearly 300,000 acres resulted in 16,000 cords of aspen mortality. |

Eastern Region (R-9) and Northeastern Area--continued

| Insect | Host | Location | Remarks |
|---|---|---|---|
| Gypsy moth<br>*Lymantria dispar* | Oaks, other hardwoods | Connecticut, Delaware, Indiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, West Virginia, Wisconsin | The total acreage for the areas of moderate to heavy defoliation decreased again this year: 2.4 million acres were defoliated in 1983 compared to 8.2 million acres in 1982. Male moths have been trapped areawide. Eradication of three spot infestations was attempted in Indiana. Several spot infestations have occurred in Wisconsin, two of these infestations have apparently been eradicated. About 450 acres were treated in Minnesota to eradicate spot infestations. |
| Half-wing geometer<br>*Phigalia titea* | Oak | Pennsylvania, West Virginia | Pennsylvania had about 27,000 acres of moderate to heavy defoliation mixed with gypsy moth defoliation. Populations have peaked and are expected to decline. In West Virginia, about 35,000 acres were defoliated as part of a "looper complex," which includes the linden looper, fall cankerworm, oak leaf rollers, oak leaf tiers, and forest tent caterpillar. Average mortality is 20 percent in areas where defoliation has occurred for 2 consecutive years. |
| Jack pine budworm<br>*Choristoneura pinus* | Jack pine | Michigan, Minnesota, Wisconsin | An undetermined amount of growth loss resulted from 155,500 acres of defoliation in 4 Wisconsin counties. Populations are expected to increase. Light to moderate defoliation occurred on 2,900 acres in Minnesota. In Michigan, close to 600,000 acres were defoliated statewide. An estimated 1.25 million cords will die if not harvested within 2 years. |
| Linden looper<br>*Erannis tiliaria* | Oaks, maples, hickories | Indiana, Pennsylvania | Pennsylvania had more than 10,000 acres of light to moderate defoliation and declining populations. In Indiana, defoliation in previous years by the linden looper together with the half-wing geometer resulted in mortality of over 2,700 trees, or 100,000 to 250,000 board feet. Approximately 22,000 board feet were salvaged. Populations are expected to remain at low levels through 1984. |

Eastern Region (R-9) and Northeastern Area--continued

| Insect | Host | Location | Remarks |
|---|---|---|---|
| Spruce budworm<br>*Choristoneura fumiferana* | Balsam fir, white spruce | Maine, Michigan, Minnesota, New Hampshire, Vermont, Wisconsin | Light to severe defoliation occurred over 20,000 acres in Wisconsin. About 138,700 acres were defoliated in Minnesota; mortality incurred from previous years' defoliation totaled 493,800 cords of fir and 8,000 cords of spruce. In Michigan, defoliation occurred on about 145,952 acres. New Hampshire had about 5,800 acres of defoliation; mortality from previous defoliation is being salvaged. Maine had about 4.0 million acres of moderate to heavy defoliation and 2.0 million acres of light defoliation. Over 300,000 acres had more than 50 percent fir mortality. Defoliation is expected to decrease to 3.0 million acres in 1984. In addition, 35,000 acres of Passamaquoddy and Penobscot Indian lands were defoliated. In Vermont, more than 178,000 acres were defoliated. |

Eastern Region (R-9) 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 | | | |
| Beech bark disease<br>*Cryptococcus fagisuga*;<br>*Nectria coccinea* var. *faginata* | American beech | New York, Pennsylvania, Vermont, West Virginia | Status in Pennsylvania since 1982 has remained static; losses are expected to increase. Mortality in West Virginia occurred on 18,000 acres where in addition to *N. coccinea* var. *faginata*, *N. galligena* is apparently killing beech. Beech scale is present on 125,000 acres. In Vermont and New York, about 90,945 acres have 30 to 100 percent mortality. |
| Root Disease | | | |
| Shoestring root rot<br>*Armillaria mellea* | Red pine | Michigan, Ohio | About 20 to 30 percent of trees 40 to 50 years old in plantations in southern and southeastern Ohio were killed. Continued mortality is expected to occur. Plantations are being preemptively salvaged, and planting and thinning practices are being reviewed. |
| Vascular Wilt | | | |
| Dutch elm disease<br>*Ceratocystis ulmi* | Elm | Areawide | Fence row, other wild, and ornamental elms are still being killed. Properly applied Dutch elm disease control programs in urban areas have succeeded in reducing annual elm mortality to less than 5 percent. |
| Oak wilt<br>*Ceratocystis fagacearum* | Oak | Indiana, Iowa, Michigan, Minnesota, Missouri, West Virginia, Wisconsin | Scattered, wilted trees in infected counties throughout the reporting States. |
| Abiotic | | | |
| Drought | All trees | Areawide | One of the worst droughts in 50 years occurred in 1983. Some areas had up to 6 inches less moisture than normal. Drought probably contributes to many decline symptoms. |

Eastern Region (R-9) and Northeastern Area--continued

| Disease | Host | Location | Remarks |
|---|---|---|---|
| Other | | | |
| Ash decline | Ash | Indiana, Iowa, Ohio, Pennsylvania, Vermont, West Virginia | In Pennsylvania, 367 acres in Sullivan County had 31 to 60 percent branch dieback. Damage in Indiana is most severe in the northeastern counties. Symptoms in West Virginia suggest this problem may now be occurring there. Fusicoccum sp. was commonly isolated from affected branches. |
| Larch decline | Larch | Maine, New York, Vermont | Decline symptoms appeared on about 3,500 acres in Vermont. Mortality associated with eastern larch beetle (Dendroctonus simplex) and Armillaria mellea. |
| Maple decline | Maple | Maine, Michigan, Vermont | Symptoms appear primarily on roadside and ornamental trees. |
| Red spruce decline | Red spruce | New York, Vermont | Decline was more evident at upper elevations than in the past. In New York, decline representing 102,540 cords occurred on 37,320 acres. Approximately 53,775 acres had mortality associated with the eastern spruce bark beetle (Dendroctonus obesus). |

Alaska Region (R-10)

Status of insects in Alaska.

| Insect | Host | Location | Remarks |
|---|---|---|---|
| A cottonwood leaf beetle *Chrysomela walshi* | Black cottonwood | Southeast Alaska | Light defoliation reported in the Mendenhall Valley near Juneau. |
| Ambrosia beetle *Trypodendron lineatum* | Sitka spruce, western hemlock | Southeast Alaska | For the third consecutive year, the striped ambrosia beetle caused substantial problems in parts of southeast Alaska--specifically the sort yards of Craig and Thorne Bay and the Yakutat area. |
| A spruce budworm *Choristoneura orae* | White spruce, Sitka spruce | South-central and southeast Alaska | Budworm populations increased between Cooper Center and Chitina, where 2,000 acres of defoliated white spruce were detected in 1983. Likewise, *C. orae* activity increased throughout the Kenai Peninsula, but populations are moderate to low in these areas. Scattered patches, totaling 800 acres, of defoliated Sitka spruce were observed throughout the northern part of the Tongass National Forest in 1983. |
| Eastern larch beetle *Dendroctonus simplex* | Tamarack | Interior Alaska | Populations at endemic levels throughout interior Alaska; only 100 acres of infested larch were detected in 1983. |
| Engraver beetle *Ips perturbatus* | White spruce | Interior Alaska | Populations at endemic levels; 100 acres infested in 1983. |
| Greenstriped forest looper *Melanolophia imitata* | Western hemlock | Southeast Alaska | Populations at endemic levels throughout southeast Alaska. |
| Hemlock sawfly *Neodiprion tsugae* | Western hemlock | Southeast Alaska | Populations of the hemlock sawfly increased dramatically and defoliated over 61,000 acres throughout southeast Alaska. Information from larval surveys also reflected the higher sawfly populations. Larvae were found on 56 of 74 plots, and the numbers increased fourfold over 1982 levels. |
| Large aspen tortrix *Choristoneura conflictana* | Quaking aspen | South-central and interior Alaska | In the Pt. McKenzie area north of Anchorage, 7,000 acres of defoliated aspen were detected. In interior Alaska near Big Delta, 23,500 acres of defoliated aspen were observed. Tortrix populations are increasing. |

Alaska Region (R-10)--continued

| Insect | Host | Location | Remarks |
|---|---|---|---|
| Spearmarked black moth *Rheumaptera hastata* | Paper birch | Interior Alaska | After almost 10 years of endemic levels, black moth populations dramatically increased in 1983 around the Fairbanks area, where 87,500 acres of defoliated birch were aerially detected. Outbreaks build up rapidly and generally last for 3 to 4 years. |
| Spruce beetle *Dendroctonus rufipennis* | White spruce, Sitka spruce | South-central and southeast Alaska | Infestations covered 328,000 acres in 1983, a 30-percent decrease over 1982 levels. White spruce mortality is occurring on 39,000 acres of the Chugach National Forest. Spruce beetle populations have declined in the southeast; currently the only active infestation is in Glacier Bay National Park, where 6,000 acres of Sitka spruce have been infested. |
| Spruce needle aphid *Elatobium abietinum* | Sitka spruce | Southeast Alaska | Spruce aphid populations were at endemic levels throughout most of southeast Alaska; in the Icy Bay area, however, 2,000 acres of defoliated spruce were detected. |
| Western blackheaded budworm *Acleris gloverana* | Western hemlock | Prince William Sound and southeast Alaska | Western hemlock defoliation was detected on 16,700 acres near Cordova and Valdez in Prince William Sound--an increase of 15,000 acres over 1982 levels. In southeast Alaska, blackheaded budworm populations were at endemic levels. |
| Willow defoliation | Willow | South-central and interior Alaska | Aerial surveys detected 12,000 acres of defoliated willow northwest of Dillingham. The causal agent has been tentatively identified as the birch leafroller, *Epinotia solandriana*. |

Alaska Region (R-10)

Status of diseases in Alaska.

| Disease | Host | Location | Remarks |
|---|---|---|---|
| Stem and Branch | | | |
| 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 infected. |
| Indian paint fungus *Echinodontium tinctorium* | Sitka spruce | South-central Alaska | Two conks of *Echinodontium* were collected near Steward. This is the second confirmed collection of this fungus in Alaska. |
| Spruce broom rust *Chrysomyxa arctostaphyli* | Sitka spruce | Southeast Alaska | Noted throughout the Sitka spruce stands at Glacier Bay National Park. |
| Foliage Disease | | | |
| Aspen leaf spots *Marssonina* sp. *Septoria* sp. | Quaking aspen | Kenai Peninsula | For the second consecutive year, leaf spotting of aspen was apparent on 6,300 acres of mixed stands near Sterling and Soldotna on the Kenai Peninsula, a 22 percent increase over 1982 levels. |
| Hemlock-blueberry rust *Pucciniastrum vaccinii* | Western hemlock | Southeast Alaska | Hemlock-blueberry rust was found lightly infecting western hemlock on Prince of Wales Island and up the Taku River. |
| Spruce needle cast *Lophodermium piceae* | White spruce, Sitka spruce | Prince William Sound, south-central Alaska | Spruce needle cast was very apparent north of Icy Bay and throughout the Kenai Peninsula. |
| Spruce needle rust *Chrysomyxa ledicola* | White spruce | Interior Alaska | Disease incidence on white spruce decreased from 11,000 acres in 1982 to 1,400 acres in 1983. Up to 90 percent of the current year's needles on all age classes of white spruce were infected. |
| Abiotic | | | |
| Winter kill | White spruce | Interior Alaska | Aerial surveys detected 4,670 acres of defoliated white spruce near Circle. A ground check did not find any biotic agents responsible for the damage. Winter drying was thought to be the causal agent. |
| Other | | | |
| Cedar mortality | Yellow cedar | Southeast Alaska | To date, approximately 25,000 acres of scattered cedar mortality have been found in southeast Alaska. The cause of the dieback has yet to be determined. |

Table 1--Aerially detected defoliation caused by the gypsy moth in the Northeastern United States

| State | Year | | Trend in 1983 |
|---|---|---|---|
| | 1982 | 1983 | |
| | | *Acres* | |
| Connecticut | 803,802 | 153,239 | - 650,563 |
| Delaware | 1,265 | 2,992 | + 1,727 |
| Maine | 574,537 | 16,285 | - 558,252 |
| Maryland | 9,162 | 15,870 | + 6,708 |
| Massachusetts | 1,383,265 | 148,133 | - 1,235,132 |
| Michigan | 92 | 457 | + 365 |
| New Hampshire | 878,273 | 560 | - 877,713 |
| New Jersey | 675,985 | 340,285 | - 335,700 |
| New York | 825,629 | 290,843 | - 534,786 |
| Pennsylvania | 2,351,317 | 1,360,824 | - 990,493 |
| Rhode Island | 658,000 | 53,880 | - 604,120 |
| Vermont | 9,864 | 0 | - 9,864 |
| Total | 8,171,191 | 2,383,368 | - 5,787,823 |

Table 2--Aerially detected defoliation caused by the spruce budworm in the Northeastern United States

| State | Year | | Trend in 1983 |
|---|---|---|---|
| | 1982 | 1983 | |
| | | *Acres* | |
| Maine | 3,852,293 | 6,000,000 | + 2,147,707 |
| Michigan | 129,140 | 145,952 | + 16,812 |
| Minnesota | 126,700 | 138,700 | + 12,000 |
| New Hampshire | 39,000 | 5,800 | - 33,200 |
| Vermont | 147,948 | 178,000 | + 30,052 |
| Wisconsin | 0 | 20,000 | + 20,000 |
| Total | 4,295,081 | 6,488,452 | + 2,193,371 |

Table 3--Slash and loblolly pine stands in the South with at least 10 percent of the trees infected with fusiform rust, 1983

| State | National Forest | Other Federal | State | Private |
|---|---|---|---|---|
| | | *Acres* | | |
| Alabama | 61,900 | 20,100 | 20,100 | 1,938,900 |
| Arkansas | 6,500 | 1,200 | 800 | 50,400 |
| Florida | 47,000 | 28,400 | 22,500 | 1,020,200 |
| Georgia | 78,500 | 71,600 | 14,800 | 3,871,700 |
| Louisiana | 61,300 | 15,700 | 31,400 | 1,461,700 |
| Mississippi | 86,500 | 6,700 | 6,800 | 1,585,200 |
| North Carolina | 28,700 | 9,600 | 9,700 | 1,296,300 |
| South Carolina | 73,081 | 45,819 | 14,699 | 1,362,877 |
| Texas | 36,500 | 1,300 | 1,400 | 461,800 |
| Virginia | 0 | 0 | 0 | 6,000 |
| Total | 479,981 | 200,419 | 122,199 | 13,055,077 |

Table 4--Aerially detected defoliation caused by the western spruce budworm in the Western United States

| Region | Year | | Trend in 1983 |
|---|---|---|---|
| | 1982 | 1983 | |
| | | *Acres* | |
| Region 1 | 2,256,311 | 2,600,000 | + 343,689 |
| Region 2 | 2,003,181 | 2,750,311 | + 747,130 |
| Region 3 | 368,485 | 371,549 | + 3,064 |
| Region 4 | 2,513,200 | 2,800,000 | + 286,800 |
| Region 5 | 0 | 0 | 0 |
| Region 6 | 1,540,000 | 2,477,000 | + 937,000 |
| Total | 8,681,177 | 10,998,860 | + 2,317,683 |

Table 5--Estimated average annual root disease-caused mortality on all lands in the Western United States

| Region | National Forest | Other Federal | State and private | Total |
|---|---|---|---|---|
| | | *Thousand cubic feet* | | |
| Region 1 | 54,400 | 8,200 | 18,100 | 80,700 |
| Region 2 | 127 * | -- ** | -- | 127 |
| Region 3 | 2,900 | 960 | 890 | 4,750 |
| Region 4 | 1,400 | 75 | 140 | 1,615 |
| Region 5 | 12,282 | 396 | 6,695 | 19,373 |
| Region 6 | 51,453 | 14,916 | 65,562 | 131,931 |
| Total | 122,562 | 24,547 | 91,387 | 238,496 |

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

Table 6--Loss caused by dwarf mistletoes, 1983

| Region | State | Area infested | Annual loss |
|---|---|---|---|
| | | *Thousand acres* | *Thousand cubic feet* |
| Region 1 | | | |
| | Montana | 2,416 | 33,250 |
| | Northern Idaho | 713 | 13,420 |
| Region 2 * | | | |
| | Colorado | 638 | 5,490 |
| | Eastern Wyoming | 361 | 4,960 |
| Region 3 * | | | |
| | Arizona | 982 | 8,140 |
| | New Mexico | 1,793 | 16,570 |
| Region 4 | | | |
| | Southern Idaho | 2,511 | 28,860 |
| | Utah | 461 | 4,750 |
| | Nevada | 62 | 580 |
| | Western Wyoming | 276 | 3,290 |
| Region 5 | | | |
| | California | 2,200 | 120,000 |
| Region 6 | | | |
| | Oregon | 4,885 | 76,560 |
| | Washington | 3,575 | 55,440 |
| Region 9 | | | |
| | Michigan | 74 | 3,740 |
| | Minnesota | 155 | 6,740 |
| | Wisconsin | 54 | 670 |
| Region 10 | | | |
| | Alaska | 1,500 | 11,000 |
| Total | | 22,656 | 393,460 |

* National Forest System lands only.

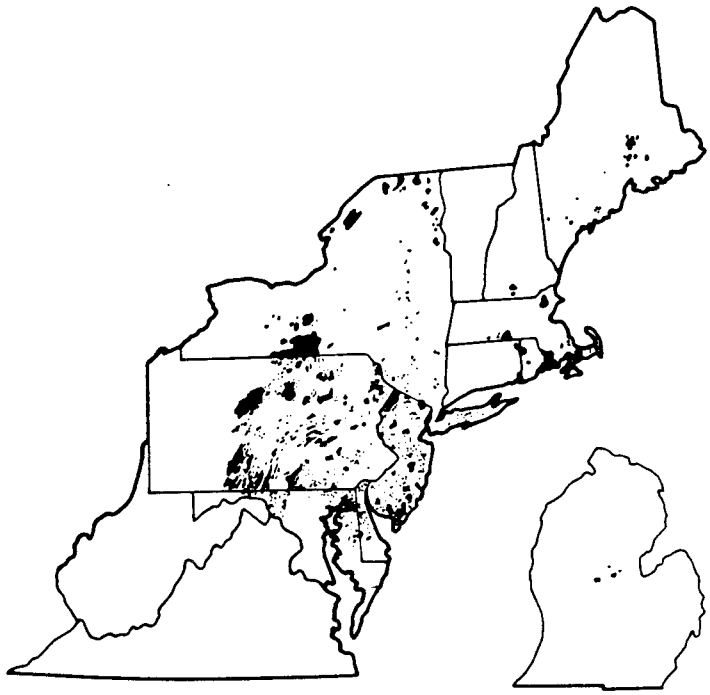

Figure 1--Gypsy moth defoliation, 1983

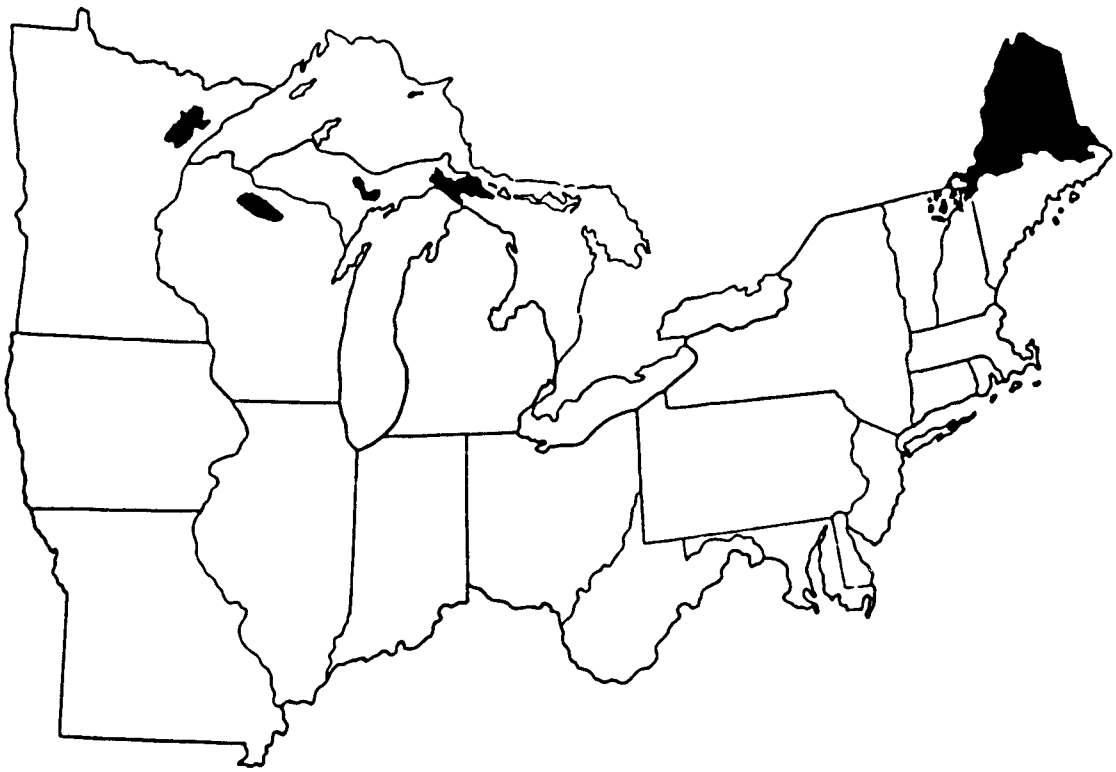

Figure 2--Spruce budworm defoliation, 1983

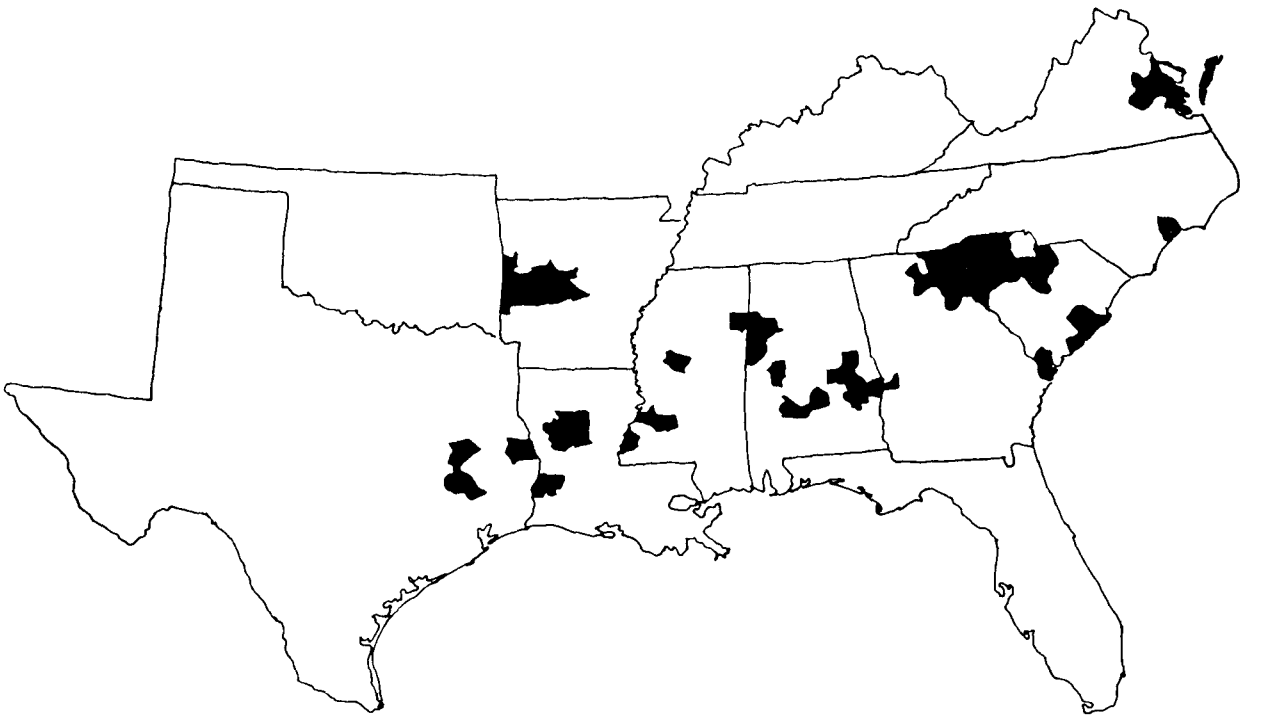

Figure 3--Counties with outbreak levels of southern pine beetle, 1983

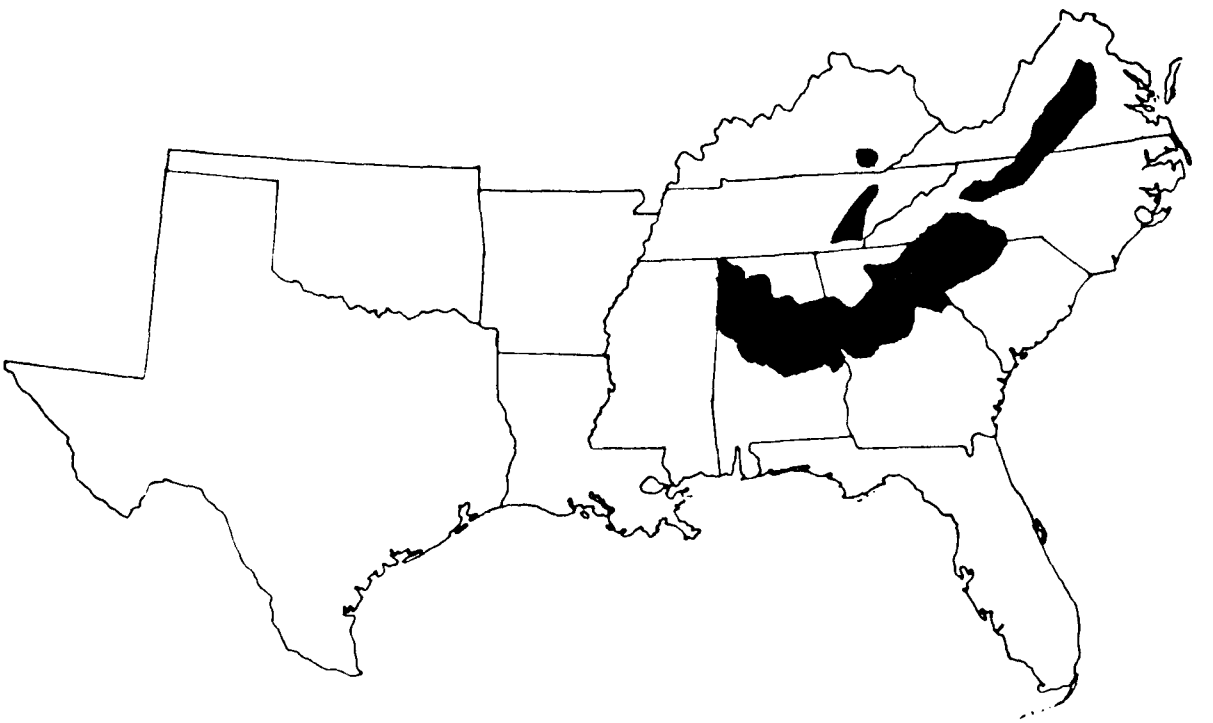

Figure 4--Known distribution of littleleaf disease, 1983

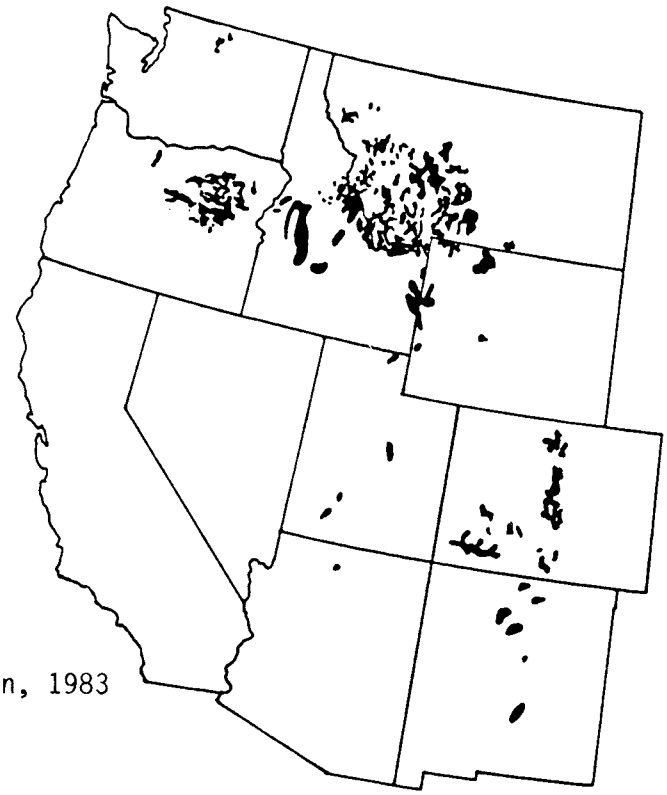

Figure 5--Western spruce budworm defoliation, 1983

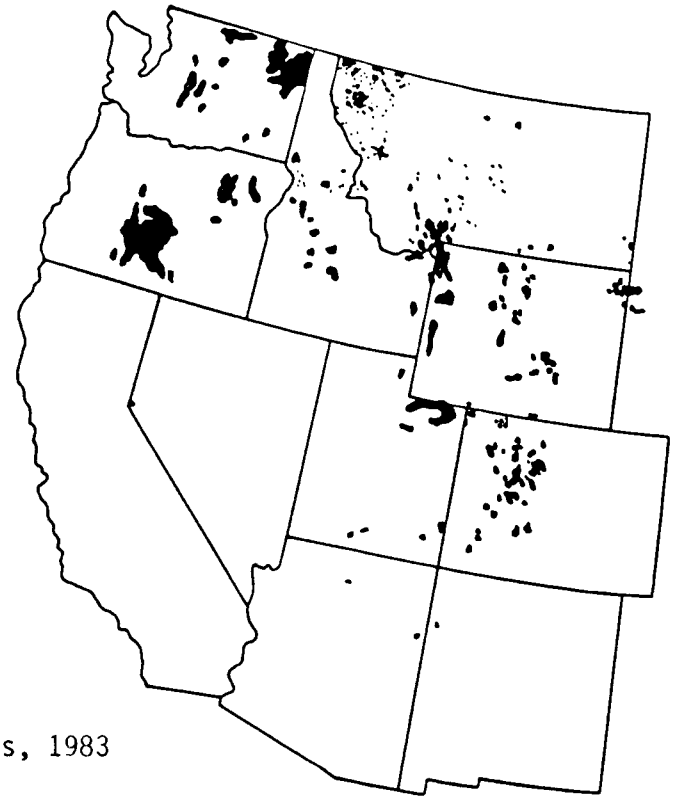

Figure 6--Mountain pine beetle infestations, 1983

*U.S. GOVERNMENT PRINTING OFFICE : 1984 0-420-932/FS-2114