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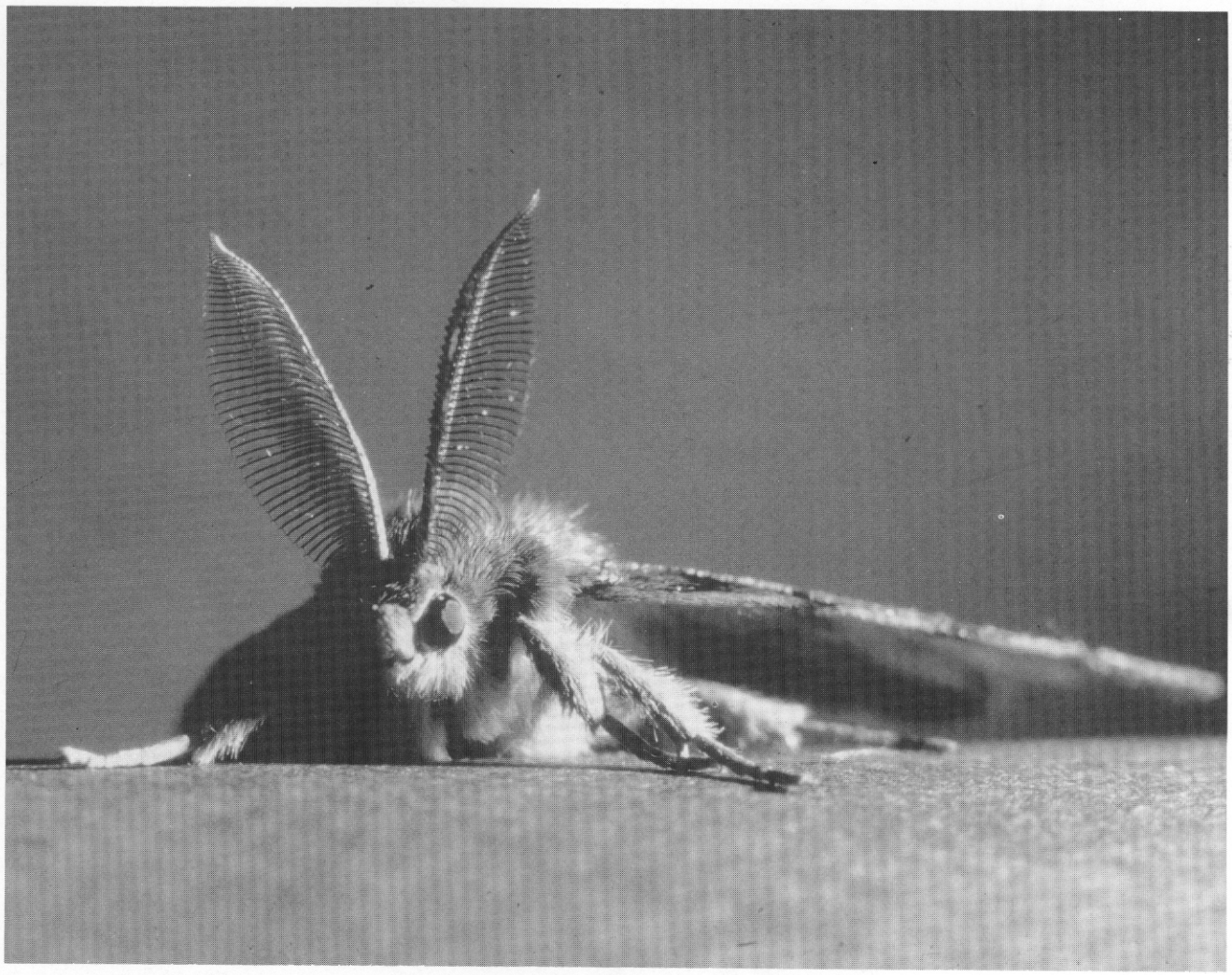
Forest Insect and Disease Conditions in the United States 1992



Forest Insect and Disease Conditions in the United States 1992

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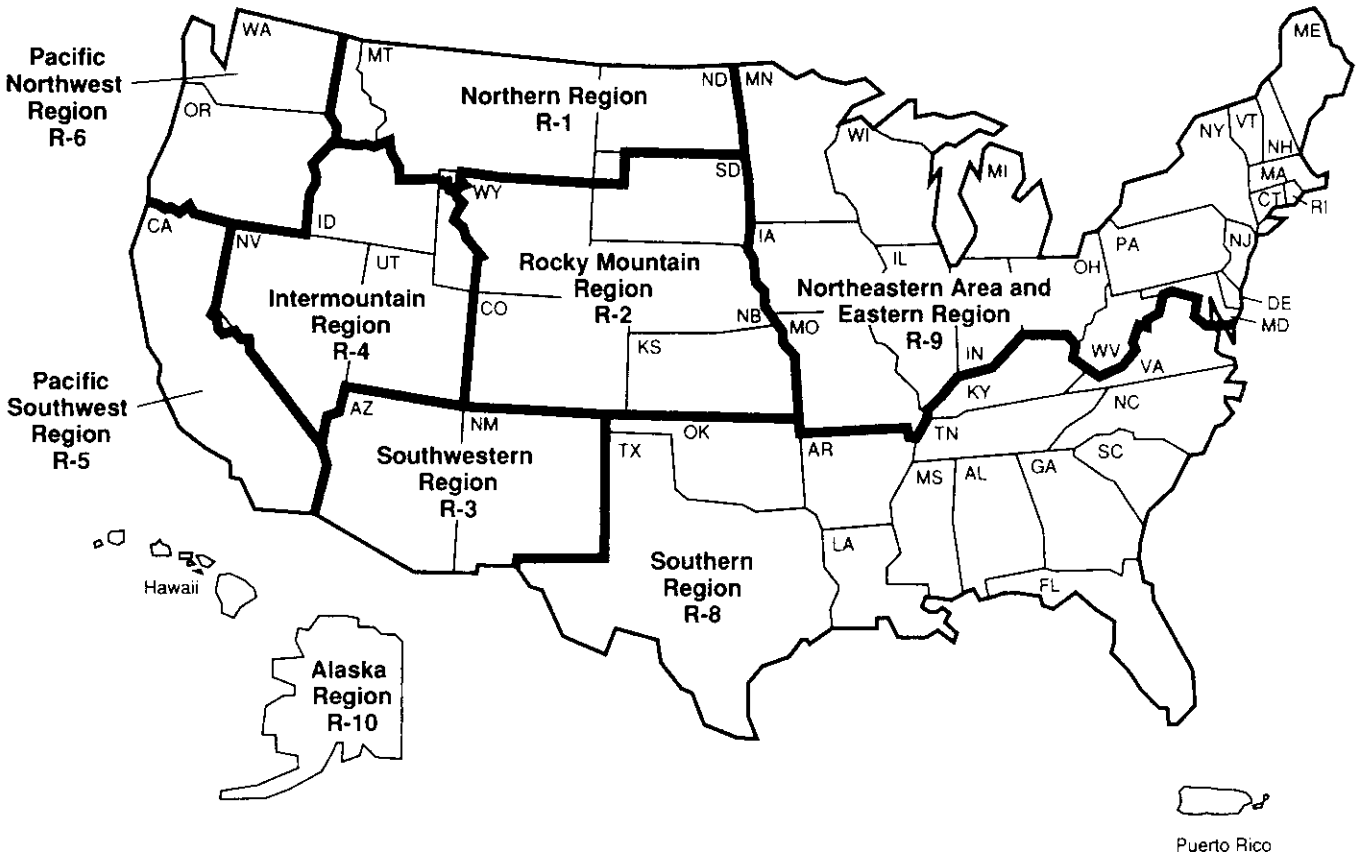
USDA Forest Service Regions and Area



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USDA Forest Service,
Forest Pest Management, AB-2S
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Cover photo: male gypsy moth adult.

Contents

Introduction

The 1992 report provides an overview of forest insect and disease conditions in the United States.

The report is a three-part publication summarizing the current status of major insect and disease pests in the United States. Part I is a condition summation of five major insects and several significant diseases. In Part II, detailed information about pest conditions on all landownerships in the Forest Service Regions is arranged numerically by Region (see map on page ii). The Northern Region (Region 1) is first, and the Alaska Region (Region 10) is last. Each Region has two sections: a section on insects, followed by a section on diseases. Part III is an index of the common and scientific names of insects and disease-causing organisms and agents found in this report.

Forest Pest Management offices nationwide completed the necessary information for lands of all ownerships.

This is the 42nd year that the U.S. Department of Agriculture, Forest Service, has published this report. Much of the report is based on special aerial or ground surveys. These surveys record short-term changes in pest activity. The information supplements the tree mortality information gathered in periodic forest resource inventory surveys done by the Forest Service.

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

For additional information about conditions in a particular state, contact one of the following Forest Pest Management staffs:

Forest Service, USDA
Northern Region (R-1)
Federal Building
P.O. Box 7669
Missoula, MT 59807

Forest Service, USDA
Rocky Mountain Region (R-2)
740 Simms Street
Golden, CO 80401

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

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

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

Forest Service, USDA
Pacific Northwest Region (R-6)
P.O. Box 3623
333 S.W. 1st Avenue
Portland, OR 97208

Forest Service, USDA
Southern Region (R-8)
1720 Peachtree Road, N.W., Room 925N
Atlanta, GA 30367

Forest Service, USDA
Eastern Region (R-9) and
Northeastern Area
5 Radnor Corporate Center
100 Matsonford Road, Suite 200
Radnor, PA 19087

Forest Service, USDA
Alaska Region (R-10)
201 E. 9th Avenue, Suite 206
Anchorage, AK 95501

Part 1 National Summary

GYPSY MOTH

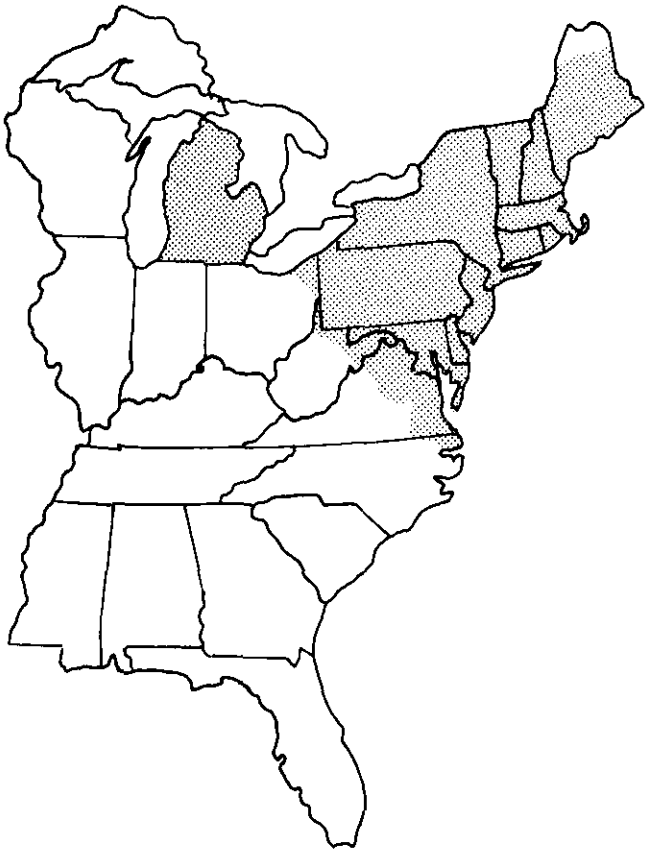
Just over 3 million acres of forests and trees were defoliated by gypsy moth (*Lymantria dispar*) in 1992. This is the second year of decline following the 7.3 million acres that were defoliated in 1990. Again, the sharpest decline occurred in Pennsylvania where defoliation was 600,000 acres compared to 1.2 million acres in 1991. The parasitic fungus *Entomophaga maimaiga* caused dramatic reductions in gypsy moth populations in parts of Pennsylvania, throughout New Jersey and in western New York. Only Michigan, Ohio and Virginia experienced increased defoliation over that reported in 1991.

This year just over 1 million acres were treated to reduce gypsy moth defoliation in the generally infested area. About 70 percent of the lands were treated with *Bacillus thuringiensis* (a biological insecticide) and about 30 percent were treated with dimilin (an insect growth regulator).

Eradication treatments were carried out against 46 isolated infestations in the States of Georgia, Iowa, Illinois, Indiana, Michigan, North Carolina, Ohio, Oregon, Tennessee, Utah, Virginia, Washington, Wisconsin and West Virginia. These treatments covered almost 80,000 acres.

In addition to the normal gypsy moth problems, eradication treatments were carried out in Portland, Oregon, and Tacoma, Washington, against infestations of the Asian form of gypsy moth. The Asian form of *Lymantria dispar* is a forest pest native to eastern Russia. These infestations were thought to have originated from Russian ships that visited these ports. Over 124,000 acres were treated three times with *Bacillus thuringiensis* in an attempt to eradicate these infestations. An intensive monitoring program detected no Asian gypsy moths following the treatment. The monitoring will continue in 1993.

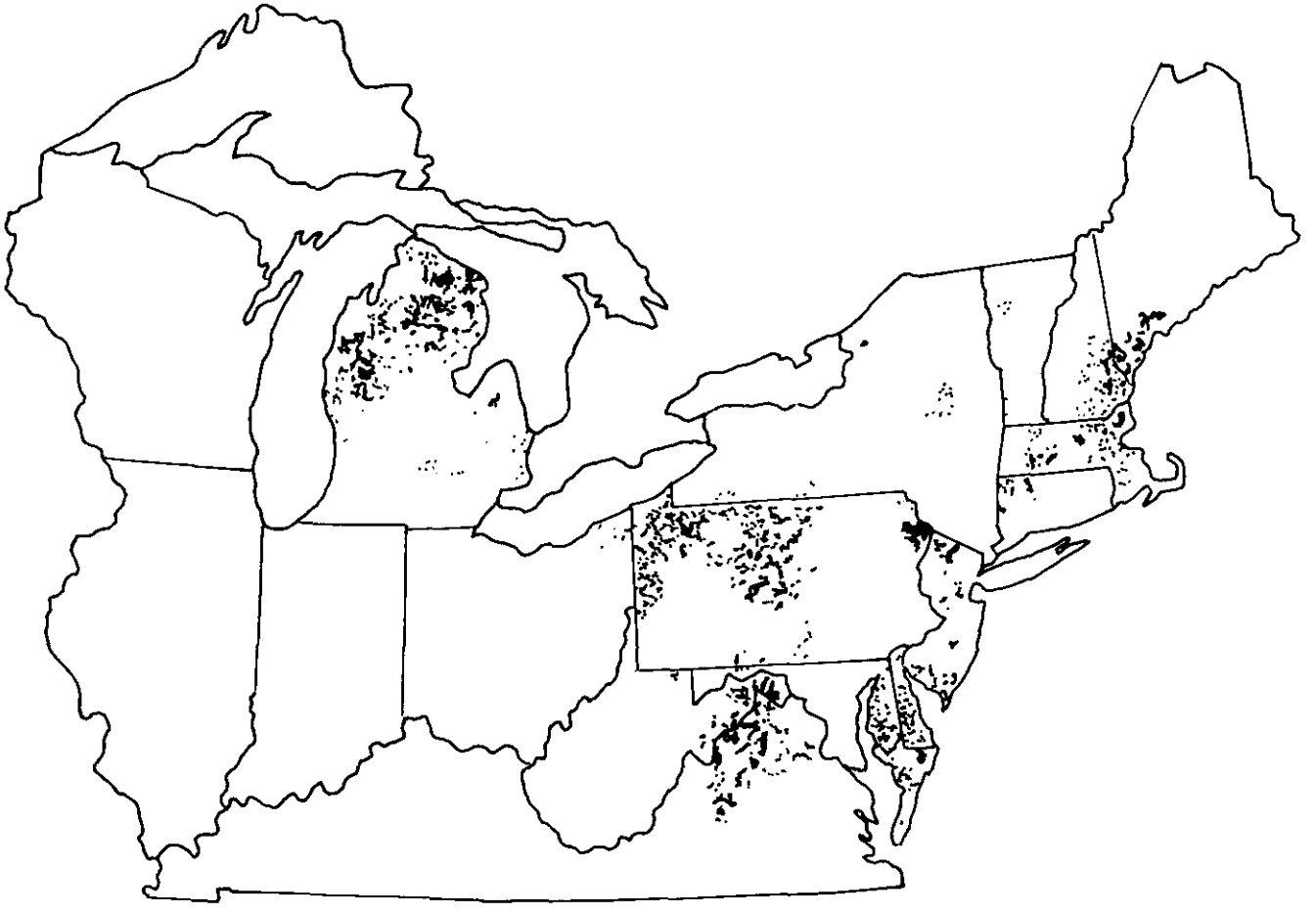
1992 Gypsy Moth Generally Infested Area



Acres of Aerially-Detected Defoliation

State	1992	1991	1990	1989	1988
Connecticut	31,637	50,154	176,576	78,430	1,600
Delaware	4,943	13,475	3,790	1,888	800
Maine	278,485	614,509	270,433	35,000	100
Maryland	38,704	75,197	133,062	97,911	58,500
Massachusetts	123,794	282,143	83,595	950	0
Michigan	712,227	626,689	358,338	294,344	70,400
New Hampshire	182,575	180,870	133,200	18,395	1,000
New Jersey	165,960	169,900	431,235	137,310	7,400
New York	60,022	175,960	354,162	421,138	5,700
Ohio	1,130	345	115	0	--
Pennsylvania	641,445	1,230,066	4,357,700	1,506,790	312,100
Rhode Island	0	0	0	0	700
Vermont	83	3,596	63,000	27,335	700
Virginia	748,000	616,200	594,000	289,332	191,000
Washington, DC	0	125	10	0	0
West Virginia	67,508	112,900	345,078	86,736	59,300
Total	**3,056,513**	**4,152,129**	**7,304,294**	**2,995,559**	**709,300**

1992 Gypsy Moth Defoliation



1992 Gypsy Moth Eradication Treatment Counties

Southern Pine Beetle

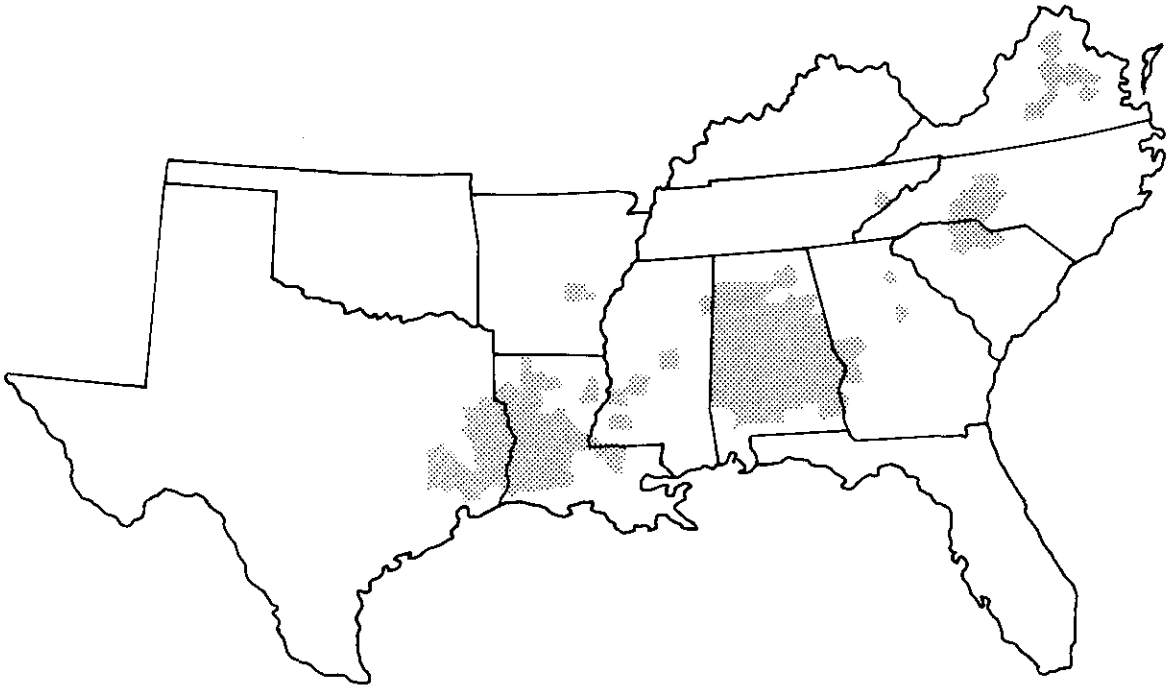
Southern pine beetle (*Dendroctonus frontalis*)-affected acreage increased 33 percent between 1991 and 1992 following a 150 percent increase between 1990 and 1991. Heaviest losses were experienced in the Gulf Costal Plain states of Alabama, Louisiana and Texas. Activity was highest in west central Louisiana and east Texas, while the entire central section of Alabama was in outbreak status.

In the Piedmont of Georgia, North Carolina and Virginia southern pine beetle populations continued at outbreak levels in 1992. In Virginia, beetle populations increased to the highest levels since the 1970's. Activity in Georgia was heaviest through the center of the State from Athens west to Stewart County. In South Carolina, outbreak activity continued in an area just north of Columbia to the state line just below Charlotte, North Carolina. Activity in North Carolina was in a nine-county area around and north of the city of Charlotte into Iredell and Davie Counties.

Southern pine beetles continue to cause significant tree mortality in the wildernesses on the National Forests in Texas. The large beetle populations pose a threat to adjacent private land and to red-cockaded woodpecker colonies. This endangered woodpecker nests in trees highly susceptible to attack by southern pine beetles. During the last three years, increased numbers of red-cockaded woodpecker cavity trees have been attacked by dispersing southern pine beetles.

The number of counties classified as "outbreak counties" increased from 77 in 1991 to 131 in 1992. Outbreak counties, listed in the table below, are defined as counties with one or more multiple-tree infestations per 1,000 acres of host type.

1992 Southern Pine Beetle Outbreak Counties



Southern Pine Beetle Outbreak Counties

Alabama:	Autauga, Barbour, Bibb, Bullock, Butler, Calhoun, Chambers, Chilton, Choctaw, Clarke, Clay, Conecuh, Coosa, Crenshaw, Cullman, Dale, Dallas, Elmore, Fayette, Greene, Hale, Henry, Jefferson, Lamar, Lee, Lowndes, Macon, Marengo, Marion, Marshall, Monroe, Montgomery, Perry, Pickens, Pike, Randolph, Russell, St. Clair, Shelby, Sumter, Talladega, Tallapoosa, Tuscaloosa, Walker, Wilcox, Winston
Arkansas:	Jefferson
Florida:	None
Georgia:	Butts, Chattahoochee, Douglas, Franklin, Henry, Jasper, Lamar, Marion, Monroe, Newton, Pike, Putnam, Schley, Stewart, Troup, Upson, Webster
Kentucky:	None
Louisana:	Acadia, Allen, Avoyelles, Beauregard, Bienville, Calcasieu, De Soto, East Baton Rouge, East Feliciana, Evangeline, Franklin, Grant, Jackson, Jefferson Davis, Natchitoches, Rapides, Red River, Sabine, Vernon, Webster, West Feliciana
Mississippi:	Claiborne, Franklin, Hinds, Leake, Monroe
North Carolina:	Cabarrus, Catawba, Cleveland, Davie, Gaston, Iredell, Lincoln, Mecklenburg, Rowan
Oklahoma:	None
South Carolina:	Cherokee, Chester, Lancaster, Union, York
Tennessee:	Sevier
Texas:	Angelina, Hardin, Jasper, Liberty, Montgomery, Nacogdoches, Orange, Sabine, San Augustine, San Jacinto, Shelby, Tyler, Walker
Virginia:	Albemarle, Appomattox, Buckingham, Campbell, Chesterfield, Fluvanna, Goochland, Greene, Hanover, Louisa, Madison, Page, Rappahannock

Acres In Outbreak*

State	1992	1991	1990	1989	1988
Alabama	5,815,700	3,937,100	0	724,000	4,762,400
Arkansas	55,800	0	0	0	0
Georgia	870,985	346,500	0	850,000	1,057,400
Florida	0	0	0	0	0
Kentucky	0	0	0	0	0
Louisiana	3,112,400	1,197,600	0	17,000	17,000
Mississippi	406,100	1,278,400	0	319,000	715,100
North Carolina	334,251	40,067	111,358	342,000	497,000
Oklahoma	0	0	0	0	0
South Carolina	469,188	2,413,632	2,320,664	753,000	609,100
Tennessee	45,900	0	0	427,000	278,100
Texas	2,663,300	1,495,900	1,800,000	1,901,000	0
Virginia	533,580	35,045	0	0	0
Total	**14,307,204**	**10,744,244**	**4,232,022**	**5,333,000**	**7,936,100**

*Acres of outbreak are acres of host type having one or more multiple-tree spots per 1,000 acres.

Spruce Budworm

Spruce budworm (*Choristoneura fumiferana*) populations remained low in 1992. The only visible spruce budworm defoliation in the United States occurred in Minnesota where 126,000 acres of light to moderate defoliation were mapped. For the second year in a row no defoliation was reported from Michigan.

The year 1990 was the first time in this century that no defoliation was reported in the Northeastern States. The year 1992 is the third consecutive year that no defoliation was reported from this region.

Acres Of Aerially-Detected Defoliation

State	1992	1991	1990	1989	1988
Maine	0	0	0	4,800	65,000
Michigan	0	0	2,500	0	0
Minnesota	126,000	108,000	198,000	140,000	200,000
New Hampshire	0	0	0	0	0
New York	0	0	0	0	0
Vermont	0	0	0	0	0
Wisconsin	0	0	0	0	0
Total	**126,000**	**108,000**	**200,500**	**144,800**	**265,000**

Mountain Pine Beetle

Mountain pine beetle (*Dendroctonus ponderosae*)-affected acreage (excluding California) increased slightly in 1992 to 641,400 acres from 617,000 acres affected in 1991. Acreage for California has been added to the table for 1992 although numbers of trees killed has been reported annually. The bulk of the trees killed by mountain pine beetle were in California and Oregon. Together, these two states accounted for more than 72 percent of the mountain pine beetle-caused tree mortality.

As drought conditions have abated in many areas of the west, tree killing by other bark beetles has also declined. However, activity by insects such as Douglas-fir beetle, fir engravers, western pine beetle and even the western balsam bark beetle remains well above normal levels.

Acreage Affected By Mountain Pine Beetle

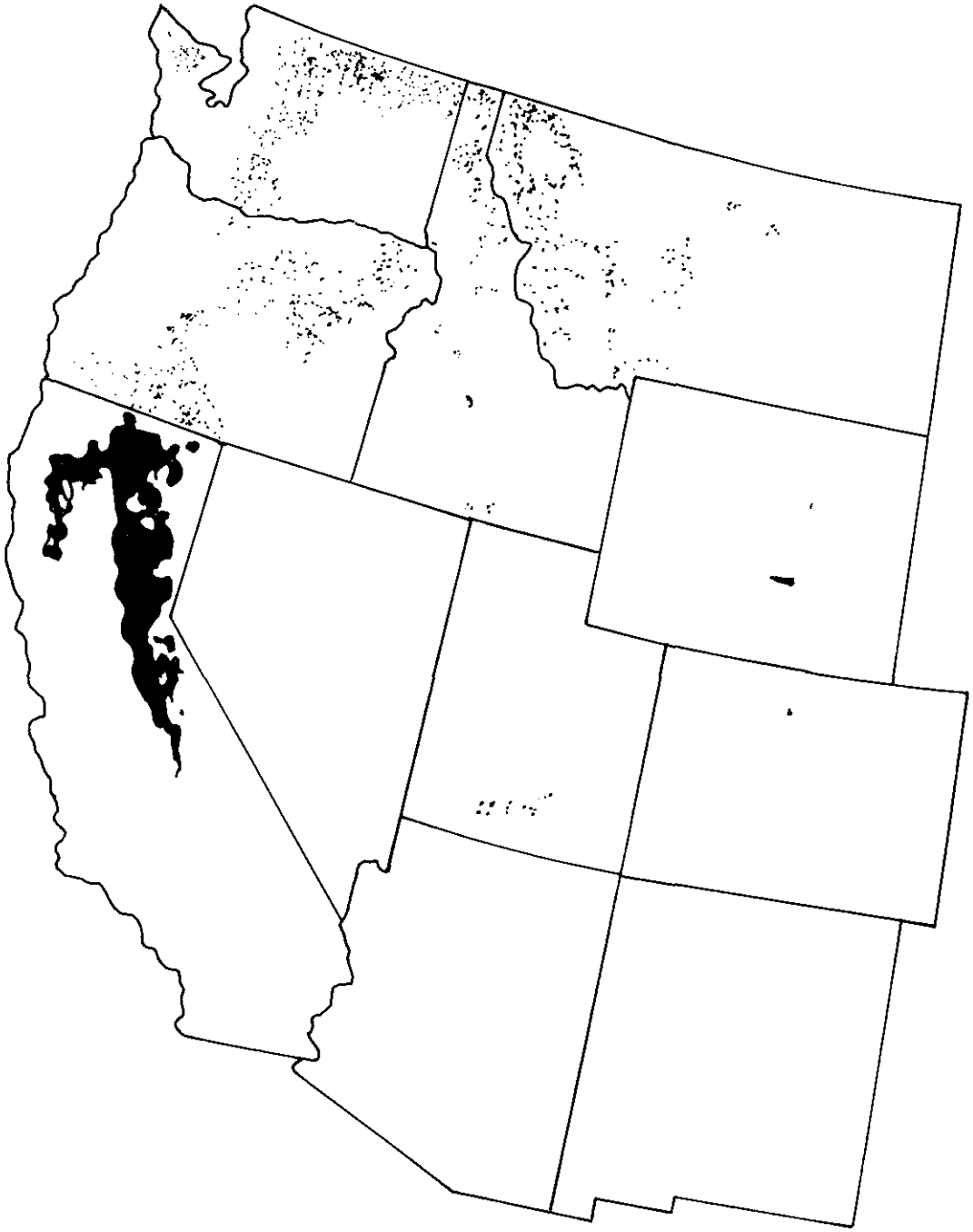
State	1992	1991	1990	1989	1988
Arizona	0	0	600	900	600
California	--	--	--	--	0
Colorado	0	1,500	9,800	12,000	13,000
Idaho	22,400	22,500	15,200	41,600	42,300
Montana	65,900	160,000	195,200	421,500	546,700
New Mexico	1,200	1,400	800	1,000	1,000
Oregon	303,000	249,600	245,100	887,926	1,311,400
South Dakota	13,600	10,000	6,800	2,400	2,600
Utah	4,100	1,300	2,000	4,500	12,500
Washington	125,200	155,400	431,700	231,375	220,300
Wyoming	106,000	15,400	28,300	11,400	55,600
Total	**641,400**	**617,100**	**935,500**	**1,614,601**	**2,206,000**

Number Of Pine Trees Killed By Mountain Pine Beetle*

State	1992	1991	1990	1989	1988
Arizona	0	30,400	2,000	2,000	620
California	775,100	974,600	1,265	681,000	0
Colorado	0	1,400	8,000	235,000	82,500
Idaho	27,400	39,700	12,000	48,500	64,500
Montana	180,800	704,600	620,000	1,332,500	2,479,700
New Mexico	1,000	2,900	4,000	2,000	1,400
Oregon	402,300	160,300	143,000	703,079	2,879,200
South Dakota	34,300	33,200	12,000	6,900	7,100
Utah	3,600	1,600	4,000	5,000	21,000
Washington	195,600	298,400	433,000	288,592	224,600
Wyoming	1,700	5,400	37,000	150,600	88,900
Total	**1,621,800**	**2,252,500**	**1,276,265**	**3,455,171**	**5,849,520**

*Not all tree mortality in Wyoming has been estimated.

1992 Mountain Pine Beetle Outbreak Areas



Western Spruce Budworm

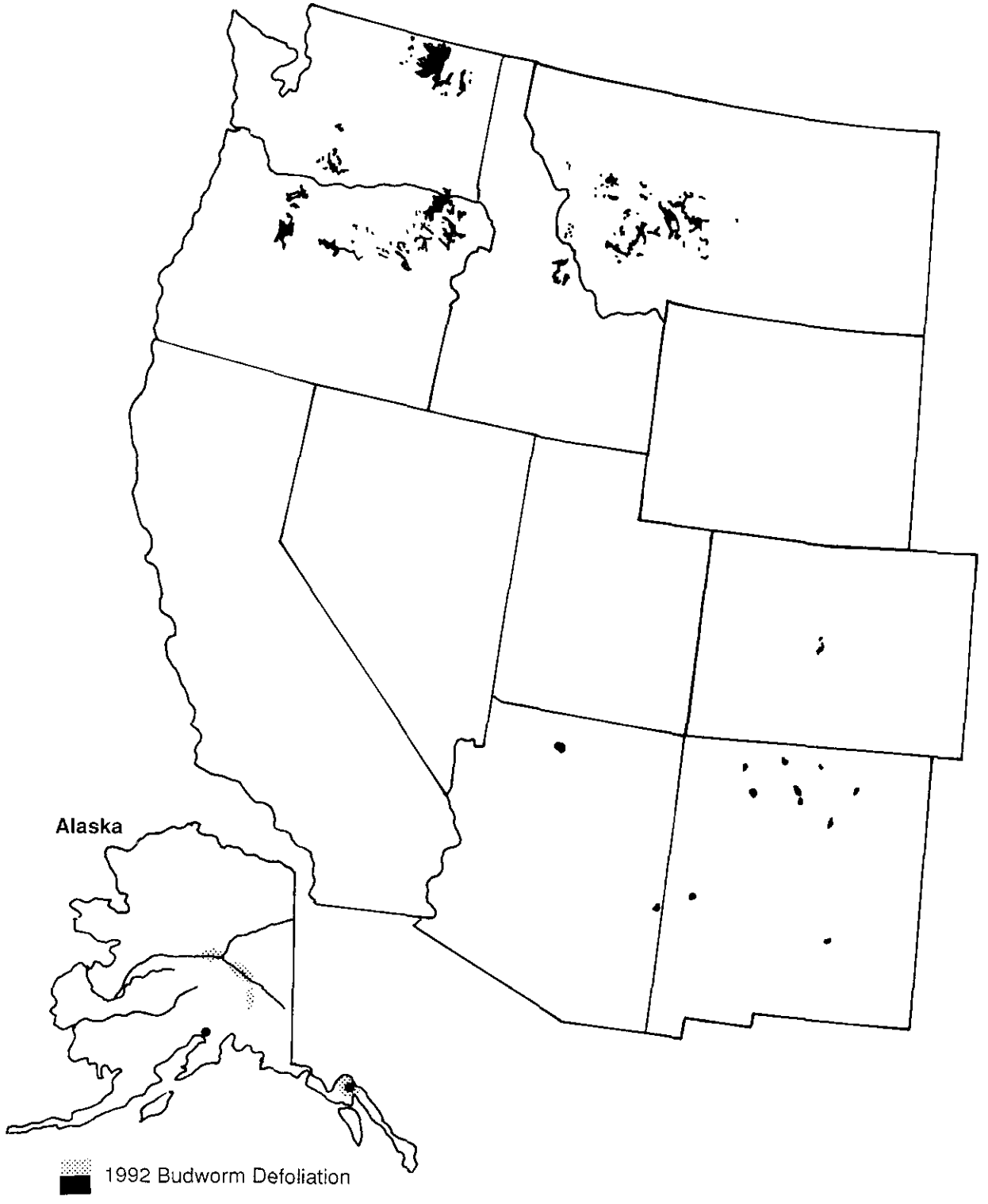
Western spruce budworm (*Choristoneura occidentalis*) defoliation decreased to 4.6 million acres in 1992 from 7.2 million acres recorded in 1991. Defoliation in Oregon and Washington accounted for 71 percent of the defoliation west-wide even though the combined defoliation in those two states decreased about 30 percent between 1991 and 1992. In Montana and northern Idaho, defoliation decreased by more than one-third. Most of this decrease was in Montana west of the continental divide. In parts of southern Idaho, ground observations indicate that the budworm is more widespread than detected by aerial surveys.

Defoliation in the Southwest decreased significantly in 1992 even though Arizona reported defoliation for the first time since 1990. Defoliation decreased in Colorado by about 50 percent. Defoliation was observed along the Front Range west of Denver and in the western part of the state.

Acres Of Aerially-Detected Defoliation

State	1992	1991	1990	1989	1988
Arizona	11,500	0	25,600	720	5,800
California	0	0	0	0	0
Colorado	272,200	509,000	52,100	52,000	427,000
Idaho	89,800	61,500	48,000	26,600	61,000
Montana	941,300	1,595,733	1,492,400	1,191,300	2,064,000
New Mexico	9,400	218,610	310,500	90,080	477,700
Oregon	1,937,700	3,724,900	2,344,300	1,416,681	2,740,400
Utah	0	0	0	0	0
Washington	1,329,500	1,027,700	351,000	362,251	231,600
Wyoming	2,500	33,500	8,100	0	55,800
Total	**4,593,900**	**7,170,943**	**4,632,000**	**3,139,632**	**6,063,300**

1992 Western Spruce Budworm Defoliation Areas



Overview of Disease Conditions

Root diseases, stem decays, white pine blister rust, dwarf mistletoes, and fusiform rust continued to be the most damaging diseases of commercially important tree species. In addition, a number of interacting biotic and abiotic factors caused both local and regional tree declines of several eastern hardwood and conifer tree species. These included ash, beech, birch, dogwood, elm, fir, maple, oak, and spruce. Widespread oak decline appeared to be related to a combination of site, weather, tree age, and pest damage factors. Dogwood anthracnose continued its spread and is of concern because the ultimate distribution and effects of this disease are uncertain.

Root diseases are among the most serious pests in the West and are difficult to control. Approximately 8.5 percent of the commercial forest land in the Pacific Northwest is affected. It is estimated that production is reduced 50 percent on affected lands. Mortality was severe in drought-stricken stands where root diseases and bark beetles work together. In the Northern Region, root diseases caused tree mortality on about 3 million acres. Damage has increased greatly over this century due to altered forest composition and structure. Root diseases interfered with management objectives on numerous other lands in the West.

In the East, root disease-caused tree mortality occurred in several areas of both conifers and hardwoods, especially areas affected by the recent drought. Southern pine beetle infestations frequently occur in root disease-infected stands. Diseased trees become hazardous in recreation areas and along roadsides.

Stem decays were a problem nationwide on both conifer and hardwood tree species. These diseases greatly reduced the commercial value of trees harvested for wood products and caused tree hazards in recreation areas.

White pine blister rust caused extensive tree mortality to western white and sugar pines in California and Oregon, and to western white pine in Idaho, Montana and Washington. Rust-resistant planting stock is being used in some areas. Whitebark pine, a grizzly bear food source, was severely damaged in and around Glacier National Park. Damage was more localized and much less severe in other parts of the West. Eastern white pine was much less severely damaged in the north-central and eastern states. Trees above 3,000 feet in elevation in parts of the south were seriously affected in localized areas.

Dwarf mistletoes, which are parasitic plants, change in abundance and distribution only gradually over time. Conifers on 22 million acres of western forests are infested. Most of the volume lost from reduced tree growth and mortality is caused by 7 of the 16 dwarf mistletoe species: those on lodgepole pine, Douglas-fir, western larch, true firs, western hemlock, and the two species on ponderosa pine. Dwarf mistletoes are relatively easy to control by removing all infected trees during harvesting.

Fusiform rust continued to be the most damaging disease of loblolly and slash pine in the South. About 30 percent of all loblolly and slash pine acres were infected, with at least 10 percent of the trees having a potentially lethal canker. Rust causes an estimated annual loss in excess of $47 million in slash and loblolly pines. Sawtimber losses account for about 89 percent of the total.

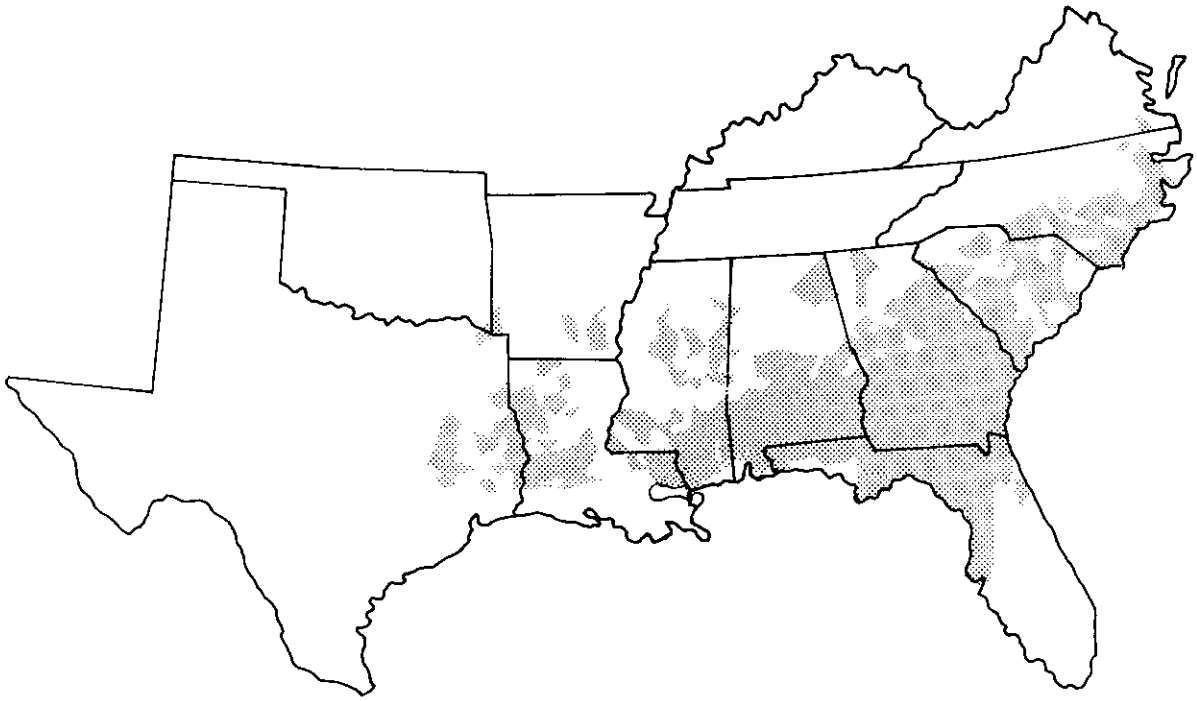
Dogwood anthracnose was first discovered in Maryland in 1984. By 1987, the disease was found in nine states from Massachusetts to Georgia. In 1991, the disease was found in 16 states from New Hampshire to Georgia and as far west as Ohio and Tennessee. The disease has killed 100 percent of the trees in some areas, especially at elevations above 3,000 feet in the South. The tree is prized for its esthetic value.

Acreage Affected by Fusiform Rust, 1992*

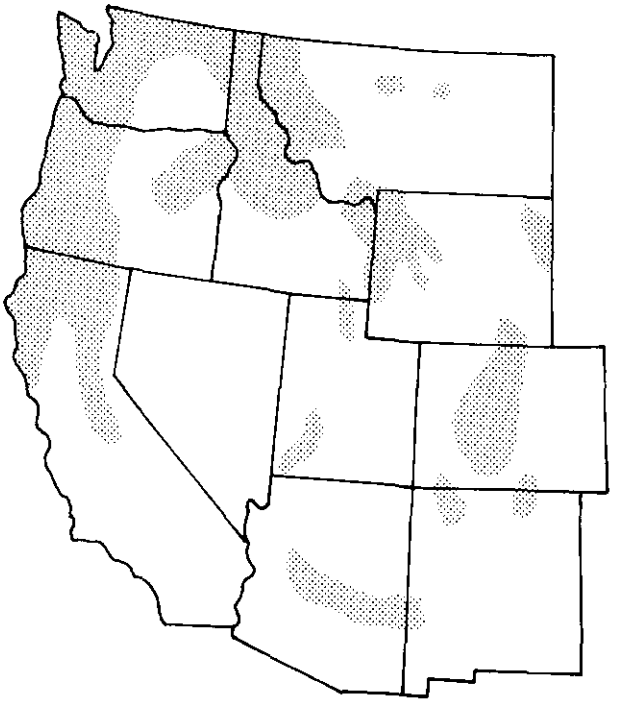
State (survey yr.)	National Forest	Other Federal	State and Private	Total
Alabama (82)	47,281	24,205	2,549,785	2,621,271
Arkansas (88)	0	0	307,378	307,378
Florida (87)	28,814	9,753	1,293,747	1,332,314
Georgia (89)	43,859	125,072	4,813,023	4,981,954
Louisiana (84)	81,938	6,315	1,696,297	1,784,550
Mississippi (87)	212,923	11,813	1,793,769	2,018,505
North Carolina (90)	3,296	14,978	1,098,281	1,116,555
Oklahoma (86)	0	0	22,525	22,525
South Carolina (86)	86,137	58,260	1,696,148	1,840,545
Texas (86)	23,352	0	601,462	624,814
Virginia (86)	0	0	70,534	70,534
Total	**527,600**	**250,396**	**15,942,949**	**16,720,945**

*Acres with greater than 10 percent infection.

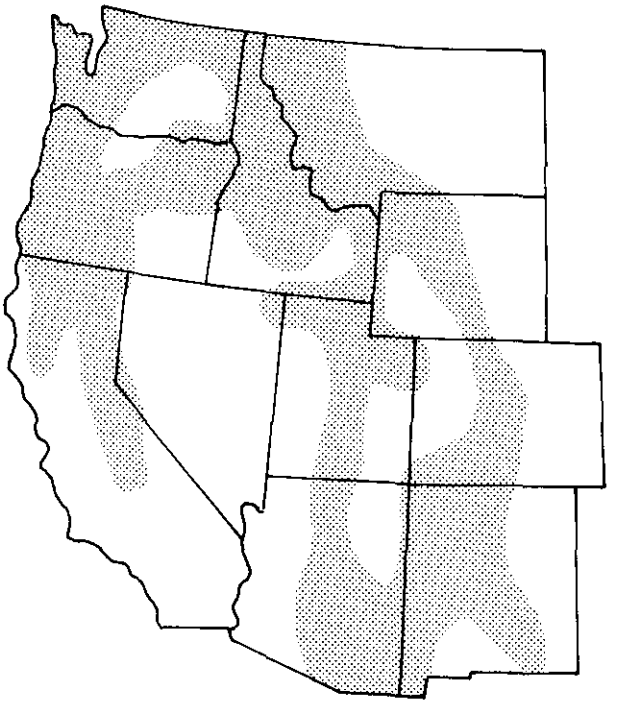
1992 Fusiform Rust Occurrence



1992 Distribution of *Fomes annosus* in Commercially Important Tree Species



1992 Distribution of Dwarf Mistletoes in Commercially Important Tree Species



Part 2 Regional Conditions

Northern Region Insects

Prepared by Jerald E. Dewey

Insect	Host	Location	Remarks
Balsam woolly adelgid *Adelges piceae*	Grand fir, Subalpine fir	Idaho	The balsam woolly adelgid population in northern Idaho has recovered from the dramatic decline in 1991 and is once again increasing. Over 17,700 acres of fading fir were detected by aerial surveys in 1992. Most of the damage continues on the Clearwater National Forest and adjacent state and private land, on private land in the Craig Mountains south of Lewiston, and in the Joseph Plains area south of the Salmon River. Tree mortality is confined to subalpine fir although gouting is prevalent on grand fir.
Boxelder defoliator *Archips negundanus*	Boxelder	Montana	No significant activity was reported in 1992.
California tortoiseshell *Nymphalis californica*	Snowbrush, Serviceberry	Idaho, Montana	No significant activity was reported in 1992.
Cranberry girdler moth *Chrysoteuchia topiaria*	Douglas-fir, Western larch	Idaho	Girdler moth pheromone trap counts at the Coeur d'Alene nursery were lower in 1992 than in 1991. Excellent control was achieved with insecticide treatments aimed at both adult moths and larvae. Immigration from surrounding grass fields remains a problem, making it necessary to continue population monitoring.

Northern Region--Status of insects in Montana, northern Idaho, North Dakota, and National Park Service Lands in northwestern Wyoming.

Insect	Host	Location	Remarks
Douglas-fir beetle *Dendroctonus pseudotsugae*	Douglas-fir	Idaho, Montana	Outbreak populations of the Douglas-fir beetle persist on several Forests in the Region where epidemics followed stand-disturbing factors such as windthrow, winter desiccation, fire, and drought. Total infested area in Montana was 9,450 acres. Of that total, more than 4,500 acres were on the Gallatin National Forest. Other significant outbreaks are on the Beaverhead National Forest, where more than 1,100 acres are infested; the Helena National Forest with nearly 1,000 infested acres; the Lolo National Forest, with just over 600 acres infested; and the Kootenai and Flathead National Forests, where approximately 500 acres are infested on each Forest. We estimate that from all these infestations, almost 13,000 Douglas-fir trees--representing approximately 4 million board foot volume--were killed in 1991 (1992 faders). In northern Idaho, the area infested increased significantly from approximately 5,300 acres in 1991 to more than 14,800 acres in 1992. Nearly 30,000 trees were estimated to have been killed. This is more than twice as many as were killed the preceding year. Most observed increases occurred on the Nez Perce National Forest, near the confluence of the Lochsa and Selway Rivers. Substantial blowdown, experienced in many parts of northern Idaho in 1991, may result in increased beetle populations again in 1993.
Douglas-fir tussock moth *Orgyia pseudotsugata*	Douglas-fir, Spruce, True firs	Idaho, Montana	No tussock moth-caused defoliation was detected in the Region in 1992. Pheromone trap catches remain low with an average of less than one moth per trap in northern Idaho and about three per trap in Montana. Though trap catches are still low, they are appreciably higher than in 1991. In Idaho some moths were caught at nearly all trapping locations. In Montana trap catches were relatively high in the vicinity of Flathead Lake with one trapping area averaging 29 moths per trap. Larval populations were also very low at all locations surveyed.

Northern Region--Status of insects in Montana, northern Idaho, North Dakota, and National Park Service Lands in northwestern Wyoming.

Insect	Host	Location	Remarks
Fir engraver beetle *Scolytus ventralis*	Grand fir, Subalpine fir	Idaho, Montana	Fir engraver populations remained essentially static in northern Idaho in 1992. The infested area increased from 5,600 to approximately 14,000 acres. However, the number of trees estimated to have been killed--just less than 15,000--was about the same as in 1991. The fir engraver has never been a major problem in Montana, compared to northern Idaho, because of the relative scarcity of its primary host (grand fir). A total of 350 trees were killed in Montana, on just over 230 acres. We consider this to be a naturally occurring endemic level of mortality.
Forest tent caterpillar *Malacosoma disstria*	Hardwoods	Idaho, Montana	No significant activity was reported in 1992.
Gouty pitch midge *Cecidomyia piniinopis*	Ponderosa pine	Idaho	No significant activity was reported in 1992.
Gypsy moth *Lymantria dispar*	Conifers, Hardwoods	Idaho, Montana, North Dakota, Wyoming	The 1992 gypsy moth detection effort was comparable to the 1991 effort with 5,800 pheromone traps deployed by the cooperating agencies. Traps were concentrated near high-use recreation sites, along major travel routes, and in most urban areas. Three moths were caught: one in Montana, one in northern Idaho, one in Yellowstone National Park, Wyoming. At each trap site with a moth catch in 1992, trap density will be increased during the next flight period.
Larch casebearer *Coleophora laricella*	Western larch	Idaho, Montana	No significant activity was reported in 1992.
Larch looper (Genus and species unknown)	Western larch	Idaho	No significant activity was reported in 1992.
Lodgepole terminal weevil *Pissodes terminalis*	Lodgepole pine	Idaho, Montana	Lodgepole terminal weevil is widespread throughout the Region. Significant damage occurs in some small localized lodgepole pine plantations in northern Idaho and western Montana. Other insects affecting the terminals of lodgepole pine have been discovered but not yet identified.

Northern Region--Status of insects in Montana, northern Idaho, North Dakota, and National Park Service Lands in northwestern Wyoming.

Insect	Host	Location	Remarks
Mountain pine beetle *Dendroctonus ponderosae*	Lodgepole pine, Ponderosa pine, Other pines	Idaho, Montana	Mountain pine beetle populations continued a decade-long decline, having peaked in the Region in 1981 with nearly 2.5 million acres infested. In 1991, approximately 163,000 acres were infested. Aerial survey estimates showed the total infested area decreased by about one-half in 1992 to just less than 80,000 acres. In Montana, the 1992 infested area declined to just over 66,000 acres. The most active infestations in Montana remain on the Flathead National Forest where approximately 2,600 acres of western white pine and another 4,200 acres of lodgepole pine were infested; the Lolo National Forest where nearly 17,000 acres of lodgepole pine and lesser amounts of other host species harbor outbreak populations; and the Kootenai National Forest with more than 33,000 acres of lodgepole pine infested. Smaller scattered infestations in most host species are found on lands of other ownerships throughout the state. In northern Idaho, the area containing beetle-caused mortality, in all hosts, increased from just 2,200 acres in 1991, to more than 13,300 acres in 1992. Nearly 17,000 trees were estimated to have been killed. The largest increases were recorded in western white pine stands on the Idaho Panhandle, and Clearwater National Forests.
Pine engraver beetle *Ips pini*	Lodgepole pine, Ponderosa pine	Idaho, Montana	The pine engraver beetle continued to kill trees in significant amounts at a number of locations in Montana in 1992. Lodgepole pine stands on the Gallatin National Forest, and ponderosa pine stands on the Northern Cheyenne Indian Reservation were seriously affected. Outbreaks on the Gallatin National Forest, resulting from trees weakened by fires in 1988 and the ensuing several years of drought, have expanded to more than 27,000 acres. Though surveys suggest populations are declining, beetles will continue to kill trees in those areas as long as affects from drought remain. Outbreaks in ponderosa pine stands on the Northern Cheyenne Indian Reservation extend to several thousand acres. These outbreaks have been exacerbated by nearly continuous available slash and abnormally dry weather. Damage attributable to the pine engraver in northern Idaho remained very low in 1992.

Northern Region--Status of insects in Montana, northern Idaho, North Dakota, and National Park Service Lands in northwestern Wyoming.

Insect	Host	Location	Remarks
Spruce beetle *Dendroctonus rufipennis*	Engelmann spruce	Idaho, Montana	Engelmann spruce beetle populations remain near endemic throughout the Region. Only 178 acres (133 trees) were infested in Montana in 1992. In northern Idaho, the small outbreak on the Nez Perce National Forest increased slightly in area in 1992, but the number of trees killed decreased. In 1991 about 1,500 trees were killed on about 1,100 acres compared to 950 trees killed on 1,329 acres in 1992. The total area infested in northern Idaho in 1992 was 1,576 acres. We anticipate a continuing decline in 1993.
Western balsam bark beetle *Dryocoetes confusus*	Subalpine fir	Idaho, Montana	Outbreak populations of the western balsam bark beetle expanded significantly throughout the Region in high-elevation subalpine fir stands. In Montana, where only 7,300 infested acres were noted in 1991, more than 56,500 acres (38,000 dead trees) were recorded in 1992. Most of the infested area occurs on the Gallatin and Beaverhead National Forests, with 32,400 acres and 22,500 acres infested respectively. Many infested stands were also observed on the Bitterroot National Forest. In northern Idaho, similar increases, but of lesser magnitude, were observed. Nearly 4,400 infested trees occurred on about 3,400 acres. Most of this mortality is on the Idaho Panhandle, Clearwater, and Nez Perce National Forests.
Western pine beetle *Dendroctonus brevicomis*	Ponderosa pine	Idaho	Western pine beetle populations in Montana were virtually unchanged in 1992 and remained at near endemic levels. Only 850 acres, totalling just 600 trees, were infested in 1992. In northern Idaho beetle activity continued a several-year decline. The limited mortality occurred on the Idaho Panhandle National Forest and surrounding state and private lands. About 4,800 trees were killed on 1,720 acres.
Western pine shoot borer *Eucosma sonomana*	Ponderosa pine, Lodgepole pine	Idaho, Montana	No significant activity was reported in 1992.

Northern Region--Status of insects in Montana, northern Idaho, North Dakota, and National Park Service Lands in northwestern Wyoming.

Insect	Host	Location	Remarks
Western spruce budworm *Choristoneura occidentalis*	Douglas-fir, Engelmann spruce, True firs, Western larch	Idaho, Montana, Wyoming	Budworm-caused defoliation decreased from 1,607,000 acres in 1991 to just less than 1 million acres in 1992. Areas where defoliation decreased the greatest were in western Montana. The Bitterroot National Forest had a decrease of 267,000 acres, and the Lolo National Forest outbreak decreased by about 158,000 acres from 1991 to 1992. The only areas in Montana showing a significant increase in acres defoliated were the Helena and Beaverhead National Forests. In northern Idaho, defoliation on the Nez Perce National Forest increased from about 12,000 acres in 1991 to nearly 58,000 acres in 1992. More than half the defoliated acres were classified as "heavy" in 1992 compared to most acreage classified as "light" in 1991.

Northern Region--Status of insects in Montana, northern Idaho, North Dakota, and National Park Service Lands in northwestern Wyoming.

Northern Region Diseases

Prepared by James W. Byler

Disease	Host	Location	Remarks
Stem and Branch Diseases			
Atropellis canker *Atropellis piniphila*	Lodgepole pine	Idaho, Montana	Atropellis canker was common in poles and sawtimber, and caused defect, top kill, and tree mortality.
Comandra blister rust *Cronartium comandrae*	Lodgepole pine, Ponderosa pine	Idaho, Montana	Comandra rust was present on lodgepole and ponderosa pine in many parts of Idaho and Montana. It was especially severe in Montana forests east of the Continental Divide.
Diplodia blight *Sphaeropsis sapinea* *(=Diplodia pinea)*	Ponderosa pine	Idaho, Montana	This pathogen was associated with branch dieback at many locations in Idaho and Montana. Damage was severe at a number of locations in Montana where tree mortality occurred during the past seven years. Branch mortality was widespread and increased in northern Idaho.
Dwarf mistletoes			Dwarf mistletoes were present on about 3 million acres, and continued to be one of the major causes of reduced forest growth. Dwarf mistletoe status changes little from year-to-year. But, over the decades, significant increases have occurred in unmanaged stands as these pathogens slowly spread and intensify.
Arceuthobium americanum	Lodgepole pine	Idaho, Montana	Lodgepole pine dwarf mistletoe infected 2 million acres (28 percent) of the lodgepole type and caused 18 million cubic feet of growth reduction.
Arceuthobium campylopodum	Ponderosa pine	Idaho	Locally heavy in ponderosa pine stands around Lake Coeur d'Alene and along the Spokane River drainage.
Arceuthobium douglasii	Douglas-fir	Idaho, Montana	Douglas-fir dwarf mistletoe infected 0.6 million acres (13 percent) of Douglas-fir, reducing growth by 13 million cubic feet.

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

Disease	Host	Location	Remarks
Arceuthobium laricis	Western larch	Idaho, Montana	Western larch dwarf mistletoe occurred on about 0.8 million acres (38 percent) of western larch stands, and reduced growth by over 15 million cubic feet.
Stem decays *Phellinus pini* *Echinodontium tinctorium*	Various conifers	Idaho, Montana	Stem decays are common, particularly in old-growth stands. *Phellinus pini* most commonly decays lodgepole pine and western larch, and *Echinodontium tinctorium* is the major pathogen of grand fir and hemlock stands.
Western gall rust *Endocronartium harknessii*	Lodgepole pine, Ponderosa pine, Scotch pine	Idaho, Montana, North Dakota	Common throughout the range of these pines, this disease caused stem infections resulting in locally severe tree mortality and top kill. Effects are most significant in young stands.
White pine blister rust *Cronartium ribicola*	Western white pine, Whitebark pine	Northern Idaho, Northwestern Montana	White pine blister rust caused extensive tree mortality throughout the range of western white pine, and prevented management of wild-type western white pine on high-hazard sites. Restoration of stands damaged by blister rust and other factors is progressing by planting them with rust-tolerant white pine. Whitebark pine, an important food source for grizzly bears, was severely damaged in the Glacier National Park Ecosystem.
Root Diseases			
			Root diseases were among the most damaging pests in the region. Annually, root diseases cause tree mortality on about 2 million acres in northern Idaho and over 1 million acres in western Montana. Damage has increased greatly during the past century as a result of altered forest composition and structure.
Annosus root disease *Heterobasidion annosum*	Douglas-fir, Grand fir, Ponderosa pine, Subalpine fir, Western hemlock	Idaho, Western Montana	Annosus root disease was common in ponderosa pine stands on the Flathead Indian Reservation and in other western Montana locations. It was widespread on Douglas-fir and true firs on the Clearwater and the Nez Perce National Forests, and has been found on most Districts on the Idaho Panhandle National Forests.

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

Disease	Host	Location	Remarks
Armillaria root disease *Armillaria* spp.	Douglas-fir, Other conifers	Idaho, Montana	Armillaria root disease was widely distributed in northern Idaho and western Montana. Increased root disease is attributed, in part, to the increase in Douglas-fir and true firs resulting from fire control and selective harvesting of high-value pine and western larch early in the 20th century. It is also a major cause of mortality in young ponderosa pine plantations.
Black stain root disease *Ceratocystis wageneri* *[Verticicladiella wageneri]*	Douglas-fir, Lodgepole pine, Ponderosa pine	Idaho, Montana	Black stain root disease was less common than other root pathogens, and its importance is unknown.
Laminated root rot *Phellinus weirii*	Douglas-fir, Grand fir	Idaho, Montana	Laminated root rot was very severe on parts of the Lolo, Kootenai, and Idaho Panhandle National Forests. It was also found on the Nez Perce National Forest and is frequently associated with other root diseases and insects in pockets of mortality. The increase in damage is attributed to the loss of disease-tolerant western white pine to blister rust, and other factors that have increased the abundance of Douglas-fir and grand fir during the present century.
Schweinitzii butt rot *Phaeolus schweinitzii*	Douglas-fir, Other conifers	Idaho, Montana	Schweinitzii root and butt rot was common on Douglas-fir throughout its range. Butt and root rot was the major common effect, rather than mortality, although the disease is frequently found with other root diseases and insects in mortality centers.
Foliage Diseases			
Dothistroma needle blight *Mycosphaerella pini* *[Dothistroma septospora (=Dothistroma pini)]*	Austrian pine, Lodgepole pine, Ponderosa pine, Western white pine	Idaho, Montana	Dothistroma needle blight increased in intensity from the Lochsa River Drainage on the Clearwater National Forest north to Sandpoint. High levels of infection were present around Post Falls and Coeur d'Alene.
Douglas-fir needle cast *Rhabdocline pseudotsugae* *Rhabdocline weirii*	Douglas-fir	Idaho, Montana	Needle diseases of Douglas-fir were at endemic levels.

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

Disease	Host	Location	Remarks
Elytroderma needle disease *Elytroderma deformans*	Ponderosa pine	Idaho, Montana	Elytroderma was chronic at certain locations, including the Bitterroot Valley, the Flathead Indian Reservation, around Flathead Lake in Montana, and throughout the range of ponderosa pine in northern Idaho.
Larch needle blight *Hypodermella laricis*	Western larch	Idaho, Montana	Larch needle blight was present in local areas of northern Idaho and western Montana.
Larch needle cast *Meria laricis*	Western larch	Idaho, Montana	Larch needle cast was also found in local areas of northern Idaho and western Montana.
Lodgepole pine needle cast *Lophodermella concolor*	Lodgepole pine	Idaho, Montana	Lodgepole pine needle cast was widespread throughout large portions of western Montana and northern Idaho. Affected stands were highly visible in the spring when infected needles turn brown.
Swiss needle cast *Phaeocryptopus gaeumannii*	Douglas-fir	Idaho, Montana	Swiss needle cast occurred at endemic levels throughout the host range.
White pine needle cast *Lophodermella arcuata*	White pine	Idaho	No significant activity was reported in 1992.
Vascular Wilts and Declines			
Dutch elm disease *Ceratocystis ulmi*	American elm, Siberian elm	Montana, North Dakota, Idaho	Dutch elm disease continued to spread in urban areas in North Dakota and Montana. Montana's highest losses occurred in Billings and Great Falls. The disease was found in northern Idaho for the first time on several elms in Moscow in 1990.
Nursery Diseases			
Cylindrocarpon root rot *Cylindrocarpon destructions*	White bark pine	Idaho	The usual nursery diseases were found in Federal, State, and private nurseries in 1992.
Fusarium root rot *Fusarium* spp.	Douglas-fir, Other conifers	Idaho, Montana	Fusarium is typically the most common nursery problem.

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

Disease	Host	Location	Remarks
Gray mold *Botrytis cinerea*	Engelmann spruce, Lodgepole pine, Western larch	Idaho, Montana	Disease was present at higher than normal levels in container-grown western larch at the Forest Service Nursery in Coeur d'Alene.
Larch needle cast *Meria laricis*	Western larch	Idaho	No above-normal activity was reported.
Phoma blight *Phoma* spp.	Most conifers	Idaho	No above-normal activity was reported.
Phytophthora root rot *Phytophthora* spp. *Phytophthora cactorium*	Engelmann spruce, Western larch	Idaho	No above-normal activity was reported.
Sirococcus tip blight *Sirococcus strobilinus*	Engelmann spruce, Ponderosa pine	Idaho, Montana	No above-normal activity was reported.
Abiotic Damage			
Winter injury and contributing diseases	All conifers	Idaho, Montana	No significant activity was reported in 1992.

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

Rocky Mountain Region Insects

Prepared by William H. Blunt

Insect	Host	Location	Remarks
A willow sawfly *Nematus* sp.	Willow	Wyoming	No significant activity was reported in 1992.
Ash plant bug *Tropidosteptes amoenus*	Green ash	South Dakota	No significant activity was reported in 1992.
Aspen leaf beetle *Chrysomela crotchi*	Aspen	South Dakota	Defoliation not evident in 1992.
Bagworms *Thyridopteryx ephemeraeformis*	Juniper	Kansas	Bagworm population was very low in 1992.
Balsam twig aphid *Mindarus abietinus*	Balsam fir	South Dakota	No significant activity was reported in 1992.
Birch skeletonizer *Bucculatrix canadensisella*	Birch	South Dakota	Defoliation not evident in 1992.
Blackheaded ash sawfly *Tethida cordigera*	Green ash	South Dakota	No significant activity was reported in 1992.
Bronze birch borer *Agrilus anxius*	Paper birch	South Dakota	No significant activity was reported in 1992.
Brown-headed ash sawfly *Tomostethus multicinctus*	Green ash	Colorado	Appears to be increasing its range within Colorado and is causing significant defoliation of ornamentals in south-central Colorado.
Bull pine sawflies *Zadiprion townsendi*	Ponderosa pine	Colorado	Defoliated individual trees along the Front Range in Colorado from north of Colorado Springs to Fort Collins.
Cankerworms *Alsophila pometaria* *Paleacrita vernata*	Bur oak, Elm, Green ash, Hackberry, Honeylocust	Kansas, South Dakota, Wyoming	Defoliation declined from 1991.

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

Insect	Host	Location	Remarks
Common falsepit scale *Lecanodiaspis prosopidis*	Green ash, Hackberry, Red mulberry	Colorado	No significant activity was observed in 1992.
Cottonwood borer *Plectrodera scalator*	Cottonwood	South Dakota	No significant activity was reported in 1992.
Dioryctria moths *Dioryctria* sp.	Pinyon pine	Colorado	Scattered outbreaks of this shoot-infesting insect continue to plague pinyon pine throughout southwestern Colorado. These scattered outbreaks are expected to continue into 1993.
Douglas-fir beetle *Dendroctonus pseudotsugae*	Douglas-fir	Colorado, Wyoming	On the Shoshone National Forest in Wyoming, the epidemic continued to increase and spread on the Clarks Fork Ranger District. About 5,600 trees were killed in 1992 between Sunlight Basin and Crandell Ranger Station. The epidemic is expected to continue into 1993. Mortality along the Colorado Front Range continues occurring in small, widely scattered groups. Most mortality is on steep, inaccessible slopes where western spruce budworm has defoliated trees over the past decade.
Elm calligrapha *Calligrapha scalaris*	Siberian elm	South Dakota	No significant activity was reported in 1992.
Elm leaf beetle *Pyrrhalta luteola*	American elm, Siberian elm	Kansas, Nebraska, South Dakota	Damage was light to moderate in central Kansas. In other areas of the state damage was less than normal.
European pine sawfly *Neodiprion sertifer*	Scotch pine	Kansas	Some growers reported heavy populations, but in most areas the population was down.
Fall webworm *Hyphantria cunea*	Cottonwood, Hickory, Mulberry, Walnut	Colorado, Kansas, Wyoming	Occasional tents of the fall webworm were observed on cottonwood in numerous drainages along the Colorado Front Range. Heavy defoliation noted in some sites. Light to moderate damage occurred in eastern Kansas.
Flea beetle *Altica* sp.	Cottonwood	Colorado	No significant activity was reported in 1992.

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

Insect	Host	Location	Remarks
Greenstriped mapleworm *Dryocampa rubicunda*	Silver maple	Kansas	Moderate defoliation was reported in the eastern part of the state.
Gypsy moth *Lymantria dispar*	Hardwoods	Colorado, Kansas, Nebraska, South Dakota, Wyoming	In South Dakota, seven moths were caught in delimitation and detection survey traps located south of Rapid City near Rockerville. No moths were detected in delimitation traps at a campground in Spearfish, South Dakota, or in Tensleep Canyon on the Bighorn National Forest in Wyoming. Delimitation trapping of sites in the Omaha, Nebraska, metropolitan area, where infested nursery stock from Pennsylvania was inadvertently distributed in 1991, captured gypsy moths at two nurseries. Fifteen moths were caught adjacent to Fuccio's Nursery in Irvington, and one moth at Yan's Nursery. Single moth catches were found in delimitation traps at Ralston and Bellevue. No moths were caught in delimitation traps at Fremont and Weeping Water, Nebraska. Single moth catches also were found in detection traps located in Beatrice and North Platte, Nebraska. No moths were caught in traps placed in several locations, predominantly developed recreational sites on the Medicine Bow National Forest in Wyoming. In Colorado, surveys continued statewide on private lands. During 1992, a total of 2,090 detection traps were deployed. An additional 146 delimitation traps were placed surrounding the six positive 1991 trap sites. Please note an error in the 1991 Conditions Report which states "no moths were caught in Colorado." A total of four moths were caught in 1992; one at Royal Gorge, one in Boulder, and two in Longmont (new location). Gypsy moths were caught in traps at three sites in Kansas. One moth was trapped in the Kansas City area, two were trapped at a campground near Salina, and one trapped at a truck stop in Salina.
Hackberry caterpillar *Asterocampa celtis*	Hackberry	Kansas	Very light defoliation was reported in 1992.
Hackberry galls *Pachypsylla celtidismamma* *P. celtidisversicula*	Hackberry	South Dakota	No significant activity was reported in 1992.

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

Insect	Host	Location	Remarks
Honeysuckle aphid *Hyadaphis tataricae*	Honeysuckle	Kansas, South Dakota	This is a relatively new pest in Kansas but is becoming a very serious pest throughout the state. Other shrubs are being selected for windbreaks because the aphid is difficult to control.
Juniper sawfly *Monoctenus fulvus*	Rocky Mountain juniper, Eastern redcedar	Kansas	No reports were received again in 1992.
Lilac borer *Podosesia syringae*	Green ash, Lilac	Kansas, Nebraska, South Dakota	No significant activity was reported in 1992.
Mountain pine beetle *Dendroctonus ponderosae*	Limber pine, Lodgepole pine, Ponderosa pine	Colorado, South Dakota, Wyoming	Tree mortality increased significantly in the central Black Hills of South Dakota from 1991 to 1992. The epidemic near Bear Mountain spread to the south. Weather conditions significantly reduced the number of trees attacked in 1992 that will die in 1993. On the Bighorn National Forest in Wyoming, mortality of limber pine continued in Tensleep Canyon. The outbreak in ponderosa pine at Laramie Peak, Wyoming, continued to decrease in 1992. However, the gross area affected is about 180,600 acres instead of the 11,000 acres mistakenly reported in 1990 and 1991. A small infestation was discovered in lodgepole pine near Lake Granby on the Arapaho National Forest. This continues at low levels throughout most of Colorado and appears to be declining in those areas which experienced fairly high populations during the late 1980's and early 1990's.
Nantucket pine tip moth *Rhyacionia frustrana*	Austrian pine, Ponderosa pine, Scotch pine, Virginia pine	Kansas	Damage was quite variable again this year. Some growers reported damage that required extensive control measures.
Pandora moth *Coloradia pandora*	Ponderosa pine	South Dakota	Populations were not apparent in 1992.

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

Insect	Host	Location	Remarks
Pine engraver beetle *Ips pini*	Lodgepole pine, Ponderosa pine	South Dakota, Wyoming	Small pockets of top killing and tree mortality continued to be abundant in ponderosa pine, especially in the southern Black Hills in South Dakota. Beetle activity in lodgepole pine was still present in blowdown material that resulted from a spring microburst windstorm in 1991 and in salvage logs near the Tie Flume Campground area of the Bighorn National Forest. Pheromone traps were used in and around the campground to reduce spread of beetles to standing, green trees.
Pine sawfly *Neodiprion autumnali*	Ponderosa pine	Nebraska, South Dakota, Wyoming	Outbreaks collapsed around the Black Hills of South Dakota following 2-3 years of heavy to severe defoliation in some areas. Defoliation occurred in pine stands along the northern Front Range west of Fort Collins. In some cases, some trees lost 80 percent of old needles. No mortality is expected.
Pine tip moths *Rhyacionia bushnelli*	Ponderosa pine	South Dakota	Damage continues to be abundant in regeneration in the central and southern Black Hills of South Dakota.
Pinyon pitch-nodule moth *Retinia arizonensis*	Pinyon pine	Colorado	No significant activity was reported in 1992.
Red turpentine beetle *Dendroctonus valens*	Jack pine, Ponderosa pine	Nebraska, South Dakota	Beetle attacks are common on stressed trees throughout the Black Hills of South Dakota and Wyoming. Populations appear to have declined from 1991 in areas with visible mechanical damage from harvesting equipment. Little tree mortality occurred. In Nebraska, beetles were commonly associated with Leptographium root disease in young jack pines; mortality was heavy in trees regenerated in patch clearcuts.
Roundheaded pine beetle *Dendroctonus approximatus*	Ponderosa pine	Colorado	This insect was commonly found on the Uncompahgre Plateau in conjunction with mountain pine beetle and western pine beetle, usually infesting the same trees.

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

Insect	Host	Location	Remarks
Spruce beetle *Dendroctonus rufipennis*	Engelmann spruce	Colorado, Wyoming	A small infestation in standing trees was discovered on the Routt National Forest in Colorado and was subsequently salvage-logged. The population had developed in road right-of-way log decks. Monitoring was conducted on several proposed and existing timber sales in southwestern Colorado. In Wyoming, population levels were low.
Tent caterpillars *Malacosoma americanum* *M. californicum* *M. disstria*	Chokecherry, Hardwoods, American plum	South Dakota, Wyoming	Defoliation was heavy in wooded draws in the Black Hills of South Dakota and Wyoming.
Twig beetles *Pityophthorus* sp.	Pinyon pine	Colorado	Twig beetles, in association with dioryctria moths, are causing mortality and branch dieback in southern Colorado.
Uglynest caterpillar *Archips cerasivorana*	Chokecherry	South Dakota	No significant activity was reported in 1992.
Unidentified caterpillar	Walnut	Kansas, Nebraska	An unidentified insect defoliated groups of trees in native stands of walnut in the eastern part of the states. The insect covers the trunk of the tree with thick webbing. The webbing is found mostly on the main trunk but can go out on the branches for a short distance. The size of the tree did not seem to make any difference. Groups of trees in the stand were defoliated instead of individual scattered trees.
Walnut caterpillar *Datana integerrima*	Black walnut, Bur oak, hickory, Pecan	Kansas	Individual trees were defoliated but the major defoliation that was experienced in 1990 did not develop in 1992.
Web-spinning sawflies *Acantholyda* sp. *Cephalcia* sp.	Ponderosa pine, Spruce	Colorado	Detected in northwestern Colorado. Some may be new species in Colorado pending further identification. Damage generally minor, but some trees experienced 25 percent defoliation and numerous unsightly web nests.
Western pine beetle *Dendroctonus brevicomis*	Ponderosa pine	Colorado	No significant activity reported in 1992.

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

Insect	Host	Location	Remarks
Western spruce budworm *Choristoneura occidentalis*	Douglas-fir, Engelmann spruce, Subalpine fir, White fir	Colorado, Wyoming	Approximately 262,000 acres of mixed conifer and subalpine forests were visibly defoliated in the Gunnison zone in 1992. This was a significant decrease from the 400,000 acres reported in 1991. The defoliation occurred on the San Isabel, Rio Grande, Gunnison and White River National Forests, as well as private land in Gunnison County. The activity in these areas is expected to continue into 1993. Areas along the Front Range on the Pike National Forest and adjacent intermingled state and private lands experienced moderate defoliation. In the Lake City area, a total of 4,791 acres of private land were aerially sprayed in June (520 acres with Bt, 4,271 with carbaryl). Levels are low in other areas of the state. In Wyoming, areas near Sunlight Basin on the Shoshone National Forest and near Lander were lightly defoliated in 1992.
White pine weevil *Pissodes strobi*	Colorado blue spruce	Colorado	White pine weevil damage to spruce leaders continued at a static level in south and central Colorado.
Yellow-necked caterpillar *Datana ministra*	Basswood, elm, Fragrant sumac, Maple, Oaks	Kansas	Damage was about normal and populations were not large enough to cause complete defoliation.

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

Rocky Mountain Region Diseases

Prepared by William H. Blunt

Disease	Host	Location	Remarks
Stem and Branch Diseases			
Ash heartrot *Perenniporia fraxinophola*	Green ash	South Dakota	No significant activity reported in 1992.
Aspen trunk rot *Phellinus tremulae*	Aspen	South Dakota	Heartwood decay due to this rot is widespread throughout aspen stands in the Black Hills National Forest.
Black knot *Apiosporina morbosum*	Chokecherry	Colorado	Cherry in riparian zones are commonly affected by this disease throughout Colorado.
Comandra blister rust *Cronartium comandrae*	Lodgepole pine	Colorado, Wyoming	Continues as one of the major diseases on the Bighorn and Medicine Bow National Forests, Wyoming. It is a particular management concern along the eastern edge of the Medicine Bow National Forest adjacent to sagebrush habitat containing the alternate host, *Comandra* spp. Damage was scattered in older lodgepole stands on the Shoshone National Forest. The disease is present in northern Colorado and western South Dakota, but causes no significant damage.
Dwarf mistletoes *Arceuthobium americanum*	Lodgepole pine	Colorado, Wyoming	Dwarf mistletoes cause the greatest disease losses in Region 2, equaling at least 10 million cubic feet annually. In Colorado, 50 percent of the lodgepole pine type is infected. Forest Health Management funded presuppression surveys on 14,711 acres on five National Forests and silvicultural control on 1,284 acres on five National Forests. In addition, 4,500 acres of Department of Interior lands were surveyed and 325 acres were treated. Continuing emphasis is being placed on suppression projects in developed recreation sites. It is widespread in some areas of the Bighorn National Forest, though not yet a management concern.
Arceuthobium douglasii	Douglas-fir	Colorado	Occurs mostly in the southern two-thirds of the state. No suppression projects were funded by Forest Pest Management in 1992.

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

Disease	Host	Location	Remarks
Arceuthobium vaginatum subsp. *cryptopodum*	Ponderosa pine	Colorado	Losses amount to 885,000 cubic feet annually. Suppression projects emphasized tree removal and pruning of infected trees in developed recreation sites. The disease continued to be a factor affecting management on the Southern Ute Reservation in southern Colorado.
Arceuthobium divaricatum	Pinyon pine	Colorado	Pinyon pine dwarf mistletoe continued as a minor problem in western Colorado.
Fir broom rust *Melampsorella caryophyllacearum*	Ponderosa pine	Wyoming	Brooms scattered on older subalpine fir in the Bighorn National Forest.
Fir trunk rot *Phellinus pini*	Subalpine fir	Wyoming	Decay and possible mortality due to this pathogen were reported for the first time on old-growth subalpine fir in the Bighorn National Forest.
Pine wilt *Bursaphelenchus xyophilus*	Austrian pine, Scotch pine, White pine	Kansas	Confirmed diagnosis of infected trees has been reported in 27 counties. Reports of infected trees were less in 1992.
Pine tip blight *Sphaeropsis elisii*	Austrian pine, Ponderosa pine	Kansas	Damage continues to increase, especially in urban and recreation plantings.
Poplar shoot blight *Venturia macularis*	Aspen	Colorado	Common on aspen regeneration in many locations in Colorado.
Red ray rot *Dichomitus squalens*	Ponderosa pine	South Dakota	Heartwood decay is widespread in mature ponderosa pine on the Black Hills National Forest.
Red ring rot *Phellinus pini*	Ponderosa pine	Wyoming	Heartwood decay due to this fungus appears to be common in mature fir stands on the Bighorn National Forest.
Spruce broom rust *Chrysomyxa arctostaphyli*	Spruce	South Dakota	Brooms scattered throughout spruce on the Black Hills National Forest. Effect on growth and regeneration of spruce is unknown.
Western gall rust *Endocronartium harknessii*	Lodgepole pine, Ponderosa pine	Colorado, Nebraska, South Dakota, Wyoming	Western gall rust is present at moderate to severe levels in lodgepole pine near the Norrie Colony on the White River National Forest in Colorado. There was no increase in activity during 1992 in Nebraska, South Dakota and Wyoming.

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

Disease	Host	Location	Remarks
White pine blister rust *Cronartium ribicola*	Limber pine	South Dakota, Wyoming	Branch mortality continued at several locations in the Bighorn National Forest. The disease is present at a remote stand in the Black Hills of South Dakota. Infected trees have been found in isolated stands.
Canker Diseases			
Botryodiplodia sp.	Juniper	Kansas	Reports of the canker in the eastern part of the state increase each year. It is moving to the western part of the state.
Botryosphaeria stevensii	Eastern redcedar, Rocky Mountain juniper	Kansas, Nebraska	No significant activity was reported in 1992.
Cytospora canker *Cytospora* spp.	Aspen, Poplars, Other hardwoods	Colorado	This disease is common on aspen throughout Colorado where it is a management concern in campgrounds and in regeneration areas. Lombardy poplars continue to die from this disease 10-20 years after planting. Widespread on many other hosts, probably as a result of the October 1991 freeze and other stresses such as the mild, dry winter of 1991-1992.
Cytospora canker *Cytospora* spp.	Aspen, Cottonwood, Mulberry, Willow	Kansas, South Dakota	It is widespread on aspen in the Black Hills, generally on trees weakened by other diseases and/or insects. This was probably the worst year ever for Cytospora canker in western Kansas. The cankers were found on all of the trees that received cold injury from the 1991 Halloween storm.
Cryptosphaeria canker *Cryptosphaeria populina*	Aspen	South Dakota	Patches of mortality in young aspen on the Pactola Ranger District of the Black Hills National Forest may have been caused by this organism. This is the first report of the canker contributing to significant aspen mortality in the Black Hills.
Grovesiella canker *Grovesiella abietina*	Subalpine fir	Wyoming	This canker was reported for the first time, causing mortality of leaders and branches of young subalpine fir in the understory. It is not causing mortality of young trees, but may be slowing their growth.

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

Disease	Host	Location	Remarks
Russian olive canker *Phomopsis* sp., *Tubercularia* sp. or *Lasiodiplodia* sp.	Russian olive	Kansas, Nebraska, South Dakota, Wyoming	Continues to be a very serious problem in the eastern half of Kansas.
Siberian elm canker *Botryodiplodia hypodermia* *Tubercularia ulmea*	Siberian elm	Colorado, Nebraska, South Dakota, Wyoming	Elm decline continued to be severe in eastern Wyoming; northern, western, and southwestern Nebraska; and southern and western South Dakota. The status is not noted to be different in 1992 than that reported in 1991.
Sooty black canker *Encoelia pruinosa*	Aspen	Colorado	Sooty black canker is a common disease in aspen stands throughout Colorado.
Thyronectria canker *Thyronectria austro-americana*	Honeylocust	Colorado, Kansas	Shade trees in Colorado were affected in large numbers in 1992, probably as a result of previously weakened condition. Windbreaks in western Kansas continue to be infected.
Root Diseases			
Annosus root disease *Heterobasidion annosum*	Ponderosa pine, White fir	Colorado, Nebraska	The disease was reported as a factor affecting management of mixed conifer stands on the Southern Ute Reservation and in white fir in the Amphitheater Campground on the Uncompahgre National Forest. The disease was also noted in spruce-fir stands at the North Cone and Truby Complex Timber Sale areas on the Uncompahgre and San Juan National Forests.
Armillaria root disease *Armillaria* spp.	Engelmann spruce, Lodgepole pine, Ponderosa pine, Subalpine fir, White fir	Colorado, South Dakota, Wyoming	In South Dakota, this root disease continues to cause mortality of spruce and ponderosa pine on the Black Hills National Forest. Large volume losses and poor regeneration of ponderose pine are occurring in the northern Hills. Impact of the disease in the southern Hills is yet to be determined. Armillaria root disease is the most common root disease in Colorado. The disease is affecting management of mixed conifer stands on the Southern Ute Reservation and is present in the spruce-fir stands at the North Cone and Truby Complex Timber Sale areas on the Uncompahgre and San Juan National Forests, and the Willow Peak and Grizzly Lake areas of the Flat Tops (Eagle Ranger District, White River National Forest).

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

Disease	Host	Location	Remarks
Armillaria root disease (Continued)			The disease was also identified as a major problem in the spruce-fir leave strips at the Aspen Mountain ski area. Assessments of Armillaria root disease impacts were carried out in regenerating lodgepole pine stands on the Alpine Plateau, west of Gunnison, and near Horseshoe Campground on the Arapaho National Forest.
Black stain root disease *Leptographium wageneri*	Pinyon pine, Ponderosa pine	Colorado	Continues to occur on ponderosa pine in interior portions of Colorado and on pinyon pine in the southwestern corner of the state.
White mottled rot *Ganoderma applanatum*	Aspen	Colorado	Reported as a potential hazard at the Woods Lake Campground in the Telluride Skyway area (currently under the jurisdiction of the Colorado Department of Wildlife).
Foliage Diseases			
Anthracnose *Gnomonia leptostyla*	Walnut	Kansas	No significant activity was reported in 1992.
Apiognomonia veneta (=*Gnomonia platani*)	Sycamore	Colorado, Kansas, Wyoming	Sycamore trees hit hard again this year in eastern Kansas. Many trees were almost completely defoliated.
Ash rust *Puccinia sparganioides*	Green ash	Kansas, Nebraska, South Dakota	No significant activity was reported in 1992.
Aspen leaf blights *Ciborinia whetzelli* *Marssonina populi*	Aspen	Colorado, South Dakota	Found throughout the aspen type, these diseases create great esthetic concern. In 1992, incidence and severity of these diseases throughout Colorado remained low.
Brown spot needle blight *Scirrhia acicola*	Scotch pine	Kansas, Nebraska	Brown spot was reported to be moderate to severe in the eastern part of Kansas.
Cedar apple rust *Gymnosporangium juniperi-virginianae*	Apple species, Eastern redcedar	Colorado, Kansas, Nebraska, South Dakota, Wyoming	No activity reported in 1992.

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

Disease	Host	Location	Remarks
Cercospora blight of juniper *Cercospora sequoiae*	Eastern redcedar, Rocky Mountain juniper	Nebraska, South Dakota	No activity reported in 1992.
Conifer-aspen rust *Melampsora medusae*	Aspen	Colorado	Like the aspen foliage diseases above, conifer-aspen rust causes great esthetic concern but little permanent damage to the host trees. Moderate disease levels were noted throughout the state.
Diplodia blight *Sphaeropsis sapinea* (=*Diplodia pinea*)	Ponderosa pine	South Dakota	Damage appeared higher in the black Hills than in recent years, probably due to a wet spring and several hailstorms.
Dothistroma needle blight *Scirrhia pini*	Austrian pine, Ponderosa pine	Kansas, Nebraska	Dothistroma needle blight was moderate to severe in eastern Kansas.
Elytroderma needle cast *Elytroderma deformans*	Ponderosa pine	South Dakota	Continues to be found in low levels in the Black Hills National Forest.
Fire blight *Erwinia amylovora*	Apple species, Cotoneaster, Crabapple	Colorado, South Dakota, Wyoming	No activity reported in 1992.
Ink spot *Ciborina whetzelii*	Aspen	Colorado	Moderate to severe damage on aspen in western and southwestern portions of the state in 1992.
Leaf shothole *Cylindrosporium* sp.	Black cherry, Chokecherry	Nebraska, South Dakota	No activity reported in 1992.
Marssonina blight *Marssonina populi*	Aspen	Colorado, South Dakota	Widespread on the Routt National Forest in northwestern Colorado due to abnormally cool, wet weather.
Melampsora leaf rust *Melampsora medusae*	Aspen	Colorado, South Dakota	Common in west-slope stands of the central Front Range in Colorado. Foliage discoloration was evident in pockets in the central Black Hills in late summer. Incidence of the rust was less than in 1991.

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

Disease	Host	Location	Remarks
Needle casts *Lophodermella concolor* *Lophodermella montivaga*	Lodgepole pine	Colorado	Noted in northcentral Colorado and southern Wyoming due to abnormally cool, wet weather.
Phomopsis blight *Phomopsis juniperovora*	Eastern redcedar, Rocky mountain juniper	Nebraska	Present in beds at Bessey Nursery, but at much lower levels than in previous years.
Septoria leaf spot *Septoria caraganae*	Caragana	South Dakota	No activity reported in 1992.
Vascular Wilts and Declines			
Ash decline	Green ash	Colorado	No activity reported in 1992.
Dutch elm disease *Ceratocystis ulmi*	Elm species	Colorado, Kansas	Incidence was down in 1992, but similar symptoms increased, resulting from the freeze damage of October 1991 in Colorado. Dutch elm disease is still a serious problem in many Kansas urban areas. Reports of the disease increased over 1991.
Oak wilt *Ceratocystis fagacearum*	Oak species	Kansas, Nebraska	This disease continues to slowly spread in the eastern third of Kansas.
Pine wood nematode *Bursaphelenchus xylophilus*	Scotch pine	Kansas, Nebraska	No activity reported in 1992.
Verticillium wilt *Verticillium* spp.	Catalpa, Maple, Redbud, Russian olive	Kansas	Verticillium wilt was severe this year.
Abiotic Damage			
Chemical damage	Many hardwood species	Colorado, Kansas, Nebraska, South Dakota, Wyoming	Herbicide damage to windbreaks and other tree plantings continues to be a serious problem.

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

Disease	Host	Location	Remarks
Cottonwood mortality	Cottonwood	Colorado	Locally severe loss of cottonwoods along the Poudre River near Fort Collins, Colorado, as a result of re-routing of the river channel and decreased available water supply to roots.
Drought, other unknown agents	Black walnut, Blue spruce, Buffaloberry, Dogwood, Green ash, Pear, Ponderosa pine, Poplar, Russian olive, Siberian elm, Silver maple	Colorado, Nebraska, South Dakota, Wyoming	No significant activity reported in 1992.
Frost damage	Hardwoods	South Dakota	No significant activity reported in 1992.
High water damage	Ponderosa pine	Colorado	No significant activity reported in 1992.
Winter drying injury	Lodgepole pine, Ponderosa pine	Wyoming, South Dakota	Widespread needle damage on lodgepole pine occurred in areas of the Bighorn National Forest. Widespread winter flecking seems to be occurring on the eastern-most natural populations of ponderosa pine in South Dakota.
Winter injury	Cedar, Hardwoods, Pines	Colorado, Kansas	Significant loss in metropolitan and urban areas in eastern Colorado and southern Wyoming due to seasonally low temperatures that occurred in October 1991 before trees hardened-off. Siberian elm particularly affected. Other species included willows, poplars, and cherry trees. A conservative estimate of mortality is more than one million trees. Cold injury was evident in many trees in the western half of Kansas after the October freeze of 1991.
Other Damage			
Hail damage	Aspen	Colorado	Localized damage was observed near Opal Lake, Pagosa Ranger District, San Juan National Forest.

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

Porcupine feeding	Ponderosa pine	South Dakota	Porcupine feeding damage was observed in association with comandra blister rust stem cankers on ponderosa pine in the Black Hills National Forest and feeding damage was also found to be extensive in patches of young, regenerating pine stands.
Sprout dieback	Aspen	Colorado	Examples of regeneration failure and dieback may be found on the Grand Mesa, Uncompahgre, Gunnison, San Juan and Routt National Forests. Snow damage, dry sites, wet sites, herbivore pressure, competing understory, soil evolution, and disease may be variously involved.
Squirrel damage	Hackberry, Honeylocust, Maples, Ponderosa pine, Russian olive, Siberian elm	South Dakota	No significant activity reported in 1992.

Southwestern Region Insects

Prepared by Terrence J. Rogers

Insect	Host	Location	Remarks
Douglas-fir beetle *Dendroctonus pseudotsugae*	Douglas-fir	Arizona, New Mexico	Douglas-fir beetle activity decreased slightly Regionwide from a total of 2,780 acres in 1991 to 2,230 acres in 1992. Small-group tree mortality (2-to-10 trees) occurred on the Apache-Sitgreaves, Coconino, Coronado, Kaibab and Tonto National Forests, Fort Apache Indian Reservation, and the Saguaro National Monument, Arizona; and the Carson, Cibola, Lincoln and Santa Fe National Forests and Taos Pueblo and Navajo Indian Reservations, New Mexico. Losses resulting from Douglas-fir beetle attacks in 1992 approximated 196,250 cubic feet of volume Regionwide.
Mountain pine beetle *Dendroctonus ponderosae*	Ponderosa pine	New Mexico	Mountain pine beetle-caused ponderosa pine mortality decreased slightly from 1,440 acres in 1991 to 1,170 in 1992. Scattered, small groups of tree mortality (2-to-10 trees) were observed on the Carson and Santa Fe National Forests, and the Navajo, Santa Clara and Taos Pueblo Indian Reservations, New Mexico. Volume losses resulting from these bark beetles were estimated at 52,750 cubic feet Region-wide.
Pandora moth *Coloradia pandora*	Ponderosa pine	Arizona	No pandora moth defoliation was detected in 1992.
Pine engraver beetles *Ips* spp.	Ponderosa pine	Arizona, New Mexico	Ponderosa pine mortality resulting from pine engraver beetle attacks decreased from 11,030 acres in 1991 to 3,830 acres in 1992. Small groups of fading trees (2-to-10 trees per spot) and occasional large-group tree mortality (25 trees and larger) occurred on the Apache-Sitgreaves, Coconino, Kaibab, Prescott and Tonto National Forests, and Fort Apache and San Carlos Apache Indian Reservations, and Saguaro National Monument, Arizona; and Cibola and Santa Fe National Forests, and Navajo Indian Reservation, New Mexico. Volume loses Regionwide were estimated at 223,050 cubic feet.

Southwestern Region--Status of insects in Arizona and New Mexico.

Insect	Host	Location	Remarks
Prescott scale *Matsucoccus vexillorum*	Ponderosa pine	Arizona	Branch dieback, caused by Prescott scale, continued to occur on the Fort Apache Indian Reservation. Approximately 1,100 acres were infested by this insect. Damages were categorized as mostly moderate.
Roundheaded pine beetle *Dendroctonus adjunctus* **Western pine beetle** *Dendroctonus brevicomis* **Mexican pine beetle** *Dendroctonus approximatus*	Ponderosa pine	Arizona, New Mexico	Mortality from roundheaded pine beetle activity in combination with western and Mexican pine beetles decreased from 91,320 acres in 1991 to 22,190 acres in 1992. As in 1991, most of the mortality occurred on the Lincoln National Forest (9,313 acres) and the Mescalero Apache Indian Reservation (11,385 acres), New Mexico. Less extensive areas of mortality also occurred on the Apache-Sitgreaves, Coconino and Coronado National Forests, Navajo, Fort Apache and San Carlos Apache Indian Reservations, and Saguaro National Monument, Arizona; and the Cibola and Gila National Forests, New Mexico. Volume losses resulting from these bark beetles were estimated at 1,840,000 cubic feet.
Spruce beetle *Dendroctonus rufipennis*	Spruce	Arizona, New Mexico	Spruce beetle-caused tree mortality increased from 430 acres in 1991 to 1,055 acres in 1992. Scattered groups of dead, fading trees (2-to-5 trees per spot) occurred on the Apache-Sitgreaves National Forest, Arizona; and the Cibola, Lincoln and Santa Fe National Forests, Mescalaro Apache and Navajo Indian Reservations, New Mexico. Current year volume losses from spruce beetle attacks approximated 63,000 cubic feet.
Western spruce budworm *Choristoneura occidentalis*	Douglas-fir, True firs, Spruce	Arizona, New Mexico	Defoliation caused by the larvae of the western spruce budworm decreased from 218,613 acres in 1991 to 20,960 acres in 1992. Defoliation occurred on the Apache-Sitgreaves (5,070 acres), Coconino (950 acres) and Kaibab (5,490 acres) National Forests, Arizona; and Gila (480 acres), Lincoln (40 acres) and Santa Fe (1,600 acres) National Forests, New Mexico. On State and private lands in New Mexico, approximately 7,115 acres of budworm defoliation occurred in Rio Arriba, Mora, Cibola and Colfax Counties.
White fir needleminer *Epinotia meritana*	White fir	Arizona	No white fir needleminer defoliation was detected in the Region in 1992.

Southwestern Region--Status of insects in Arizona and New Mexico.

Southwestern Region Diseases

Prepared by David Conklin and Mark Schultz

Disease	Host	Location	Remarks
Stem and Branch Diseases			
Aspen stem cankers *Encoelia pruinosa* *Ceratocystis fimbriata* *Cryptosphaeria populina* *Hypoxylon mammatum* *Cytospora chrysosperma*	Aspen	Arizona, New Mexico	These canker fungi cause significant reductions in growth and vigor of mature aspen stands. In Region 3, stands often have over 30 percent infection with canker fungi. In campgrounds, stem cankers are typically more prevalent due to damage from campers.
Aspen trunk rot *Phellinus tremulae*	Aspen	Arizona, New Mexico	Aspen trunk rot is the most common cause of decay in mature aspen stands throughout the Region.
Atropellis canker *Atropellis* spp.	Southwestern white pine	New Mexico	This canker disease is common and locally abundant on the Lincoln National Forest and Mescalero Apache Indian Reservation, but is not causing major damage.
Comandra blister rust *Cronartium comandrae*	Mondell pine, Ponderosa pine	Arizona	Comandra blister rust occurs on exotic mondell and native ponderosa pines in the Payson, Sedona and Prescott areas. Damage is to individual trees in landscape areas and Christmas tree plantations.
Dwarf mistletoes *Arceuthobium* spp.	Douglas-fir, Pines, Spruces	Arizona, New Mexico	Dwarf mistletoes are the most widespread pests in the Region. Approximately 46 percent (2.2 million acres) of the total commercial acreage (4.8 million acres) is infected, accounting for greater than 25 million cubic feet of volume loss. Esthetic value and longevity of trees in recreation areas and visual corridors are also impacted.
Fir broom rust *Melampsorella caryophyllacearum*	True firs	Arizona, New Mexico	Fir broom rust is widely distributed throughout the subalpine, corkbark and white fir habitat types in the southwest. Damages typically consist of stem and branch swellings, dead tops and stem breakage.

Southwestern Region--Status of diseases in Arizona and New Mexico.

Disease	Host	Location	Remarks
Limb rust *Cronartium arizonicum* *Peridermium filamentosum*	Ponderosa pine	Arizona	Small-group (2-to-3 trees) infections are located throughout the ponderosa pine forests of the southwest.
Red ring rot *Phellinus pini*	Douglas-fir, Ponderosa pine, Spruce, True firs	Arizona, New Mexico	*Phellinus pini* is indigenous to mature and overmature stands of pine and mixed conifers. Its distribution is scattered and losses and damages are minimal in most stands.
Red rot *Dichomitus squalens*	Ponderosa pine	Arizona, New Mexico	Red rot decay is distributed throughout the Region and is the most common cause of decay in living ponderosa pine in the southwest.
Rust-red stringy rot *Echinodontium tinctorium*	White fir	Arizona, New Mexico	This fungus is found in mature and over-mature stands of mixed conifers.
Spruce broom rust *Chrysomyxa arctostaphyli*	Spruce	Arizona, New Mexico	Spruce broom rust is scattered throughout the host type but is of little commercial significance.
White pine blister rust *Cronartium ribicola*	Southwestern white pine	New Mexico	Cankers have been observed throughout the host range on the Cloudcroft, Mayhill and Smokey Bear Ranger Districts, and on the Mescalero Apache Indian Reservation. Several hundred acres of young plantations on the Cloudcroft Ranger District are severely infected. Visible damage is increasing.
Root Diseases			
Annosus root disease *Heterobasidion annosum*	Douglas-fir, Ponderosa pine, Spruces, True firs	Arizona, New Mexico	In Arizona and New Mexico, root and butt rot pathogens are responsible for 34 percent of the trees killed. Infection in some conifer stands is greater than 25 percent. *Armillaria* sp. account for 80 percent of root damage in conifers.
Armillaria root disease *Armillaria* sp.	Aspen, Douglas-fir, Ponderosa pine, Spruce, True firs	Arizona, New Mexico	Annosus root disease accounts for the remaining 20 percent. The Southwest looses an estimated 4.8 million cubic feet annually to root rot.

Southwestern Region--Status of diseases in Arizona and New Mexico.

Disease	Host	Location	Remarks
Black stain root disease *Leptographium wageneri var. wageneri*	Pinyon pine	Arizona, New Mexico	No significant activity was reported in 1992.
Schweinitzii butt rot *Phaeolus schweinitzii*	Douglas-fir, True firs	Arizona, New Mexico	No significant activity was reported in 1992.
Tomentosus root rot *Inonotus tomentosus*	Spruce	Arizona, New Mexico	No significant activity was reported in 1992.
White mottled rot *Ganoderma applanatum*	Aspen	Arizona, New Mexico	No significant activity was reported in 1992.
Foliage Diseases			
Sycamore anthracnose *Apiognomia veneta*	Arizona sycamore	Arizona	Due to abundant spring rains, Sycamore caused defoliation and stem dieback in riparian zones in north-central Arizona.
Needle rust *Coleosporium jonesii*	Pinyon pine	New Mexico	Needle rust was detected in northern New Mexico, near Tesuque.
Elytroderma needle disease *Elytroderma deformans*	Pinyon pine, Ponderosa pine	Arizona, New Mexico	Elytroderma disease is distributed widely but at low levels.
Lophodermella needle cast *Lophodermella cerina*	Ponderosa pine	New Mexico	In 1992, this needle cast was detected in several locations in the state. Approximately 19,000 acres showed discoloration during aerial detection surveys, a slight increase from 1991.
Pinyon needle cast	Pinyon pine	New Mexico	This disease was severe on the Lincoln National Forest and portions of the Gila National Forest.
Leaf-blister fungus *Taphrina caerulescens*	Gambel oak	Arizona	Signicant defoliation occurred on the Kaibab and Coconino National Forests.
Nursery Diseases			
Sirococcus tip blight *Sirococcus strobilinus*	Ponderosa pine	Arizona	No significant activity was reported in 1992.

Southwestern Region--Status of diseases in Arizona and New Mexico.

Disease	Host	Location	Remarks
Abiotic Damage			
Drought	Pinyon pine, Ponderosa pine	Arizona, New Mexico	Precipitation was above normal in 1992. However, bark beetle outbreaks that have continued on the Coronado and Lincoln National Forests and Mescalero Apache Indian Reservation are likely related to moisture stress of previous years.
Salt damage	Ponderosa pine	Arizona, New Mexico	Needle discoloration occurred along high elevations in New Mexico and Arizona from salt used to de-ice highways. Salt damage was also observed on dirt roads in Arizona where salts were used for dust abatement.
Winter Injury	Alligator juniper	Arizona	No significant damage was reported in 1992.
Other Damage			
Aspen defoliation **Large aspen tortrix** *Choristoneura conflictana* **Western tent caterpillar** *Malacosoma californicum* **Marssonina leaf blight** *Marssonina populi*	Aspen	Arizona, New Mexico	Defoliation caused by this insect and disease complex decreased Regionwide from 29,140 acres in 1991 to 20,550 in 1992. Pockets of aspen defoliation occurred on the Apache-Sitgreaves, Coconino, Coronado, Kaibab and Prescott National Forests, and Fort Apache Indian Reservation, Arizona; the Carson, Cibola, Lincoln and Santa Fe National Forests, and the Mescalero, Santa Clara Pueblo and Navajo Indian Reservations, New Mexico.
True fir mortality *Scolytus ventralis* (in white fir); *Dryocetes confusus* (in subalpine fir) *Armillaria spp.* *Heterobasidion annosum*	White fir, Subalpine fir	Arizona, New Mexico	True fir mortality resulting from this insect and disease complex remained relatively unchanged from the 1991 level. In 1991, mortality was detected on 2,495 acres and in 1992 on 2,450 acres. Small groups of dead-fading firs were observed on the Apache-Sitgreaves, Coconino, Coronado, Kaibab and Tonto National Forests, Fort Apache Indian Reservation and the Chiricahua National Monument. Estimated volume losses from this insect and disease complex approximated 213,000 cubic feet.
Looper abiotic complex *Galenara consimilis*	Douglas-fir, White fir	New Mexico	No significant activity was reported in 1992.

Southwestern Region--Status of diseases in Arizona and New Mexico.

Intermountain Region Insects

Prepared by K. Andrew Knapp

Insect	Host	Location	Remarks
Boxelder leafroller *Caloptilla negundella*	Boxelder	Idaho	No significant activity was reported in 1992.
Cooley spruce gall adelgid *Adelges cooleyi*	Douglas-fir, Spruce	Idaho, Utah, Wyoming	This adelgid was found in forested stands and ornamental trees throughout the Region. Impact appeared greatest in ornamental trees.
Douglas-fir beetle *Dendroctonus pseudotsugae*	Douglas-fir	Idaho, Utah, Wyoming	Mortality increased in Idaho and Utah, and decreased in Wyoming. In southern Idaho, 105,500 trees were killed; the largest infestations were located on the Boise, Payette and Sawtooth National Forests; smaller infestations were located on the Challis, Salmon and Targhee National Forests. In Utah, 5,100 trees were killed, a significant increase from 1991. The largest infestation was located on the Wasatch-Cache National Forest; smaller infestations occurred on the Ashley and Manti-LaSal National Forests. In Wyoming, activity was static with 8,300 trees killed on the Bridger-Teton National Forest.
Douglas-fir tussock moth *Orgyia pseudotsugata*	Douglas-fir, True firs	Idaho, Utah	Defoliation increased from 316,000 acres in 1991 to 421,000 acres in 1992, with most of the increase occurring in southern Idaho. This is the greatest acreage of Douglas-fir tussock moth defoliation ever recorded in the Region. In Idaho, 418,000 acres of defoliation were detected on the Boise National Forest and contiguous areas of the Sawtooth National Forest, on the Payette National Forest, throughout the Owyhee Mountains, and along the Big Wood River drainage near Ketchum. In northern Utah, 3,200 acres of defoliation were detected on the Wasatch-Cache National Forest, a decrease from 1991 levels. Regionwide, most defoliation was classified as moderate to heavy with significant mortality occurring in areas with three consecutive years of heavy defoliation.

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

Insect	Host	Location	Remarks
Fir engraver beetle *Scolytus ventralis*	Grand fir, Red fir, Subalpine fir, White fir	Idaho, Nevada, Utah, Wyoming	True fir mortality attributed to fir engraver beetle attack remained static in Nevada and Utah while significantly increasing in southern Idaho. Approximately 269,800 trees were killed Regionwide compared to 249,400 trees in 1991. In Nevada, 195,100 trees were killed on the Toiyabe National Forest, the largest infestation in the Region. In Idaho, 41,900 trees were killed, primarily on the Boise National Forest. In Utah, 32,800 trees were killed on the Wasatch-Cache National Forest.
Forest tent caterpillar *Malacosoma disstria*	Apple, Cherry, Gambel oak	Utah	Heavy defoliation on approximately 550 acres occurred on the Pleasant Grove Ranger District of the Uinta National Forest.
Gypsy moth *Lymantria dispar*	Hardwoods	Utah	This is the fourth consecutive year of the Utah Gypsy Moth Eradication Program. In 1992, three 15,718-acre aerial applications of *Bacillus thuringiensis* (B.t.) were applied in the Bountiful, Provo and Salt Lake City, Utah, area.
Jeffrey pine beetle *Dendroctonus jeffreyi*	Jeffrey pine	Nevada	On the Toiyabe National Forest, tree mortality totaling 10,900 trees, occurred throughout the Lake Tahoe Basin in western Nevada and on the Las Vegas Ranger District in southern Nevada.
Large aspen tortrix *Choristoneura conflictana*	Aspen	Utah	No significant activity was reported in 1992.
Mountain pine beetle *Dendroctonus ponderosae*	Lodgepole pine, Ponderosa pine	Idaho, Utah, Wyoming	Decreases in lodgepole and ponderosa pine mortality occurred in Idaho while increases in mortality occurred in Utah and Wyoming. In southern Idaho, 10,600 trees were killed in 1992, while in 1991, 30,400 trees were killed. The largest center of mortality in the Region was located within the Sawtooth National Recreation Area on the Sawtooth National Forest. Smaller outbreaks occurred on the Boise and Challis National Forests. In Utah, mountain pine beetle killed 3,600 trees. Increases in tree mortality occurred on the Wasatch-Cache and Dixie National Forests, while activity on the Manti-LaSal National Forest remained static. On the Bridger-Teton National Forest in western Wyoming, 1,400 trees were killed in 1992 compared to 1,700 trees in 1991.

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

Insect	Host	Location	Remarks
Mountain pine beetle (Continued)	Whitebark pine	Idaho, Nevada, Utah, Wyoming	Increases in mountain pine beetle activity in whitebark pine occurred in Idaho and western Wyoming. On the Payette National Forest in southern Idaho, 2,000 dying trees were detected, while on the the Bridger-Teton National Forest in western Wyoming, 1,300 dying trees were detected. Smaller, less extensive infestations occurred in Utah and Nevada.
Oystershell scale *Lepidosaphes ulmi*	*Populus spp.*	Utah	Moderate to heavy populations of this insect, infesting cottonwoods and aspen, were located in Ranch Canyon on the Bureau of Land Management Beaver Resource Area near Milford, Utah. Damage was variable, ranging from single-branch to entire-tree mortality.
Pine engraver beetle *Ips pini*	Lodgepole pine, Ponderosa pine	Idaho, Nevada, Utah	This insect, often associated with western pine beetle and Jeffrey pine beetle, occurred throughout southern Idaho and western Nevada.
Pinyon pine engraver beetle *Ips confusus*	Pinyon pine	Utah	No significant activity was reported in 1992.
Red turpentine beetle *Dendroctonus valens*	Ponderosa pine,	Idaho, Utah	Partially scorched trees were attacked in a small area near Buckeye Mountain on the Moab Ranger District of the Manti-LaSal National Forest. Activity occurred throughout burned areas in southern Idaho.
Silver fir beetle *Pseudohylesinus sericeus*	Grand fir	Idaho	This beetle overwinters under the bark in the root collars of grand fir and signs of this over-wintering population were evident in 1991. These infested trees were not killed by the silver fir beetle. No additional reports of this insect were noted in 1992.
Spruce beetle *Dendroctonus rufipennis*	Spruce	Idaho, Utah, Wyoming	Activity, totaling 56,000 trees killed, an increase from 1991, occurred throughout the Region. In Idaho, 32,000 trees were killed on the Payette National Forest, the largest outbreak in the Region. In Utah, 20,500 trees were killed on the Manti-LaSal National Forest. Smaller outbreaks are present on the Dixie and Fishlake National Forests. In Wyoming, static levels of activity were observed on the Bridger-Teton National Forest with 900 dying trees detected.

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

Insect	Host	Location	Remarks
Spruce engraver *Ips pilifrons*	Spruce	Utah	Small, scattered infestations were found in Peterson Grove on the Teasdale Ranger District, Dixie National Forest.
Spruce seed moth *Laspeyresia youngana*	Spruce	Utah	Moderate populations were found infesting cones on the Fishlake National Forest in Utah.
Sugar pine tortrix *Choristoneura lambertiana*	Pines	Idaho	Light to moderate defoliation of lodgepole pine occurred in scattered 5- to 10-acre pockets on the Salmon National Forest, Idaho.
Western balsam bark beetle *Dryocoetes confusus*	Subalpine fir	Idaho, Utah, Wyoming	Mortality decreased Regionwide with 187,300 dying subalpine fir trees detected in 1992 compared to 244,400 in 1991. In southern Idaho, mortality occurred on the Boise, Challis, Sawtooth and Targhee National Forests with 80,400 trees killed. In Utah, increases in mortality, totaling 70,100 trees killed, occurred on the Ashley, Dixie, Manti-LaSal and Wasatch-Cache National Forests; static levels of activity occurred on the Uinta National Forest. In Wyoming, decreases in activity occurred on the Bridger-Teton National Forest where 36,800 dying trees were observed.
Western pine beetle *Dendroctonus brevicomis*	Ponderosa pine	Idaho	Activity remained relatively static with 8,800 trees killed in 1992 compared to 8,200 trees in 1991. Most activity is located on the Boise and Payette National Forests in southern Idaho.
Western spruce budworm *Choristoneura occidentalis*	Douglas-fir, True firs	Idaho	Aerially visible defoliation decreased from 49,300 acres in 1991 to 32,000 acres in 1992. Most defoliation is located on the Salmon National Forest while a smaller outbreak is located on the Challis National Forest. Ground observations indicate that western spruce budworm activity, undetectable aerially, is extensive throughout host type on the Salmon National Forest and within areas defoliated by Douglas-fir tussock moth on the Payette National Forest.

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

Intermountain Region Diseases

Prepared by K. Andrew Knapp

Disease	Host	Location	Remarks
Stem and Branch Diseases			
Aspen trunk rot *Phellinus tremulae*	Aspen	Idaho, Nevada, Utah, Wyoming	Decay occurs in most aspen stands in the Region.
Canker of subalpine fir *Pleurocytospora*-like	Subalpine fir	Idaho	Branch flagging, top-killing and mortality attributed to this fungus occurred in localized areas throughout host type. Infection levels declined in southern Idaho.
Comandra blister rust *Cronartium comandrae*	Lodgepole pine, Ponderosa pine	Idaho, Utah, Wyoming	Infection occurs infrequently throughout Idaho and Utah. Localized areas of heavy infection resulting in branch, top and entire tree mortality of sapling-size ponderosa pines occurs across southern Idaho. In Wyoming and northern Utah, heavy infection occurs on lodgepole pine in localized pockets.
Cytospora canker of true firs *Cytospora abietis*	True firs	Idaho, Utah, Wyoming	Branch flagging, top-killing and mortality attributed to this fungus occurred in localized areas throughout the host type. This disease was frequently found occurring with western balsam bark beetle attacks.
Dwarf mistletoes *Arceuthobium* spp.	Douglas-fir, Jeffrey pine, Lodgepole pine, Ponderosa pine, True firs, Western larch	Idaho, Nevada, Utah, Wyoming	Suppression projects continue to remove infected overstory trees; however, this forest pest remains the most widespread and frequently observed pest within the Intermountain Region. Regional incidence by major host species is as follows: lodgepole pine 45 percent, ponderosa pine 25 percent and Douglas-fir 33 percent infected.

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

Disease	Host	Location	Remarks
Limb rust *Peridermium filamentosum*	Ponderosa pine	Utah	Infection causes branch mortality and occasional tree mortality in all size classes of hosts on the Dixie National Forest in southern Utah.
Pinyon blister rust *Cronartium occidentale*	Pinyon pine	Idaho, Utah	This disease occurs on the Moab Ranger District, Manti-LaSal National Forest, Utah, and in the Raft River Mountains on the Sawtooth National Forest, Idaho.
Red ring rot *Phellinus pini*	Douglas-fir, Pines, Spruce, True firs, Western larch	Idaho, Utah, Wyoming	Infection intensity varies throughout stands in the Region.
Rust-red stringy rot *Echinodontium tinctorium*	Grand fir, Subalpine fir, White fir	Idaho, Nevada, Utah	Decay caused by this fungus is common in mature and overmature stands of true firs.
Stalactiform blister rust *Cronartium coleosporioides*	Lodgepole pine	Idaho, Nevada, Utah	This rust occurs in localized areas throughout the host type. Heavy infection has been noted in localized areas on the Boise, Payette, Sawtooth and Targhee National Forests in Idaho.
True mistletoe on juniper *Phoradendron juniperinum*	Junipers	Nevada, Utah	This pest occurs on juniper on the Fishlake and Dixie National Forests in Utah, and in the Great Basin National Park in Nevada.
Western gall rust *Endocronartium harknessii*	Lodgepole pine, Ponderosa pine	Idaho, Utah, Wyoming	Gall rust occurs extensively throughout the hosts types. Varied infection levels are observed with localized heavy infection levels present in both host species.

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

Disease	Host	Location	Remarks
White pine blister rust *Cronartium ribicola*	Limber pine, Western white pine, Whitebark pine	California, Idaho, Nevada, Wyoming	This disease was commonly found on both five-needle pine hosts on the Payette, Salmon and Sawtooth National Forests. This pest was observed on western white pine on the Toiyabe National Forest in Nevada and California.
Other stem decays *Cryptoporus volvatus* *Fomitopsis officinalis* *Polyporous sulphureus*	All tree species	Idaho, Nevada, Utah, Wyoming	A large number of minor stem decay agents, too numerous to list, occur with varying intensity throughout the Region.
Root Diseases			
Annosus root disease *Heterobasidion annosum*	Douglas-fir, Engelmann spruce, Jeffrey pine, Lodgepole pine, Ponderosa pine, True firs	California, Idaho, Nevada, Utah, Wyoming	Infection causes varying amounts of root and butt rot in mature individuals of many tree species, and may result in predisposition to windthrow and/or beetle attack. In grand fir and subalpine fir, it is most commonly found as a butt rot. Infection-induced mortality occurs occasionally in young ponderosa pine and seldom in other hosts.
Armillaria root disease *Armillaria* spp.	Douglas-fir, Grand fir, Pines, Spruce, Subalpine fir	Idaho, Nevada, Utah, Wyoming	Evidence of Armillaria root disease can be found throughout the Region. In southern Idaho, northern Utah, Nevada, and Wyoming, it functions primarily as a weak pathogen or or saprophyte causing little direct mortality. In southern Utah, in some cases, it acts as a primary pathogen killing mature and immature ponderosa pine and mature true fir and spruce.
Artist's conk *Ganoderma applanatum*	Aspen	Idaho, Nevada, Utah, Wyoming	This pathogen is commonly observed in association with wind-thrown aspen on the Dixie and Fishlake National Forests in Utah, and Humboldt National Forest in Nevada.

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

Disease	Host	Location	Remarks
Black stain root disease *Ophiostoma wageneri* *(=Ceratocystis wageneri)*	Pinyon pine	Idaho, Nevada, Utah	This fungus causes mortality of pinyon pine on the Bureau of Land Management's Burley District in Idaho, on the Humboldt and Toiyabe National Forests in Nevada, and on the Dixie and Manti-LaSal National Forests in Utah.
Schweinitzii butt rot *Phaeolus schweinitzii*	Douglas-fir, Grand rir, Ponderosa pine	Idaho	Decay is common in mature and overmature forests throughout the host type, especially those having a fire or logging history. The fungus is often associated with other root pathogens and bark beetle activity. Trees are seldom killed directly as a result of infection.
Tomentosus root disease *Inonotus tomentosus*	Douglas-fir, Spruce, Subalpine fir	Idaho, Utah	This fungus is found alone or associated with *Phaeolus schweinitzii* and *Armillaria* spp. It causes butt and root rot of pole-sized and larger trees, predisposing trees to bark beetle attack and windthrow in southern Idaho. In southern Utah, it kills pole-sized and larger spruce in progressively enlarging disease centers.
Foliage Diseases			
Conifer - Aspen rust **Conifer - Cottonwood rust** *Melampsora medusae* *Melampsora occidentalis*	Aspen, Conifers, Cottonwood	Idaho, Nevada, Utah, Wyoming	Infected cottonwood and aspen were commonly observed in southern Idaho. Some aspen clones were severely defoliated by these fungi. Limited infection of the alternate host conifers was confirmed.
Douglas-fir needle cast *Rhabdocline* spp.	Douglas-fir	Idaho	Incidence decreased with very light infection noted throughout the range of Douglas-fir in southern Idaho.
Elytroderma needle disease *Elytroderma deformans*	Ponderosa pine	Idaho	Systemic and annual infections occur throughout the host type and are especially severe in southwestern Idaho. Except in the systemic "brooms," new foliage discoloration caused by this fungus decreased in 1992.
Fir broom rust *Melampsorella caryophyllacearum*	Subalpine fir	Idaho, Nevada, Utah, Wyoming	Infections occur throughout the host's range. Infection intensity varies significantly, but is pandemic in stands south of the Snake River in Idaho.

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

Disease	Host	Location	Remarks
Fir needle cast *Lirula* spp.	Grand fir, Subalpine fir	Idaho	Infections were at endemic levels throughout the host type.
Fir needle rust *Pucciniastrum epilobii*	Subalpine fir	Idaho, Wyoming	Seedling and sapling-size trees throughout the host type were variably infected.
Incense cedar broom rust *Gymnosporangium libocedri*	Incense cedar	California, Nevada	This disease occurs in isolated patches of host trees on the Toiyabe National Forest in Nevada and California.
Larch needle blight *Hypodermella larices*	Western larch	Idaho	Incidence and severity of infection in west-central Idaho were very light. Detection was confounded by severe frost damage that occurred shortly after spring needle flush.
Larch needle cast *Meria laricis*	Western larch	Idaho	Incidence and severity of infection in west-central Idaho were very light. Detection was confounded by severe frost damage that occurred shortly after spring needle flush.
Marssonina blight *Marssonina populi*	Aspen	Idaho, Utah, Wyoming	Scattered incidence of moderate to heavy intensity was noted throughout most of the host's range in southern Idaho, northern Utah, and western Wyoming.
Pine needle rust *Coleosporium* spp.	Lodgepole pine, Ponderosa pine	Idaho	Scattered incidence of light to moderate intensity occurred throughout the host types in southern Idaho.
Shepherd's crook *Venturia macularis*	Aspen	Idaho, Utah	Scattered incidence of light to moderate intensity was noted in southern Idaho and throughout Utah.
Spruce broom rust *Chrysomyxa arctostaphyli*	Engelmann spruce	Idaho, Utah, Wyoming	Scattered infections occurred throughout the host type, especially in eastern Idaho and in localized pockets on the Fishlake National Forest, Utah.
Nursery Diseases			
Fusarium cortical stem rot *Fusarium avenaceum*	Douglas-fir, Ponderosa pine, True firs	Idaho, Utah	This disease caused scattered mortality primarily of 1-0 conifer seedlings at the Lucky Peak Nursery, Boise National Forest, Idaho, and the Lone Peak Nursery in Utah.

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

Disease	Host	Location	Remarks
Fusarium root disease *Fusarium oxysporum*	Douglas-fir, Ponderosa pine, True firs	Idaho, Utah	This disease caused small amounts of mortality primarily of 1-0 conifer seedlings at the Lucky Peak Nursery, Boise National Forest, Idaho, and the Lone Peak Nursery in Utah.
Phytophthora/ Pythium root rot *Phytophthora* spp. *Pythium* spp.	Douglas-fir, Spruce	Idaho, Utah	These fungi occur on seedlings and in soil at the Lucky Peak Nursery, Boise National Forest, Idaho, and the Lone Peak Nursery in Utah. Infection results in mortality and culling of 2-0 seedlings.
Abiotic Damage			
Drought	All vegetation	Regionwide	Premature needle drop, leaf scorch and seedling mortality were observed due to six consecutive years of below-normal precipitation. Damage was especially apparent on the Toiyabe National Forest in western Nevada.
Spring frost	Western larch	Idaho	An early spring frost killed western larch foliage on the Payette National Forest, Idaho.
Winter drying	Ponderosa pine	Utah	No significant activity was reported in 1992.

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

Pacific Southwest Region Insects

Prepared by John W. Dale

Insect	Host	Location	Remarks
A bagworm *Unknown*	Acesia, Banana, Taro	Federated States of Micronesia	The larvae makes a bag of small host leaf fragments.
A California spruce budworm *Choristoneura carnana californica*	Douglas-fir	Northern California	For the seventh consecutive year, there was no visible defoliation of Douglas-fir in Trinity County.
A cutworm *Spondoptera litara*	Cruciferous crops	Federated States of Micronesia	This is a frequent pest in agro-forestry gardens.
A Gelechiid leaf skeletonizer *Chionodes trichostola*	Blue oak	Northern California	Damage to blue oak in Shasta and Tehama Counties was at a level higher than in 1991. The outbreak started in 1990, the worst year for defoliation.
A leafhopper *Sophonia* (=*Pseudonirvana*) sp. nr. *rufofascia*	Numerous hosts including natives	Hawaii, Kauai, Lanai, Maui, and Oahu Islands	Leaves become chlorotic and/or distorted. Due to its large host range, this insect is a suspect in the die-off of Uluhe fern and other plant species such as *Acacia koa* (Koa tree quick-decline).
A leafroller *Unknown*	Eucalyptus	Guam, Northern Mariana Islands	Identity has not been determined.
A long-horned grasshopper *Oxyahyla intricata*	Cassava, Vegetable crops	Federated States of Micronesia	No significant activity was reported in 1992.
A long-horned grasshopper *Segestes unicolor*	Coconut and other palms, *Heterospathe elata*	Koror and Palau Islands, Republic of Palau	Damage increased in 1992.

Pacific Southwest Region--Status of insects in California, Hawaii, the Commonwealth of the Northern Mariana Islands, the Federated States of Micronesia, the Republic of the Marshall Islands, the Republic of Palau, the Territory of American Samoa, and the Territory of Guam.

Insect	Host	Location	Remarks
A mealybug *Unknown*	Banana	Chuuk-Federated States of Micronesia	This mealybug attacks the fruit. Identity has not been determined.
A Mindarus twig aphid *Mindarus* sp.	White fir	Northern California	An integrated pest management program based on recent research was initiated at Placerville Nursery. It now appears that the aphid may be a new species of Mindarus.
A pyralid moth *Thliptoceras octoquttale*	*Mussaenda frondosa*	Palau - Republic of Palau	This moth bores into apical buds and is a serious pest of this shrub.
A root collar weevil *Pissodes* sp.	Bishop pine	Northwestern California	A few hundred Bishop pine saplings or small poles were killed in the Sprowel Creek area, Humboldt County, by root collar weevils and roundheaded borers (as yet unidentified).
A rose beetle *Adoretus versutus*	Cocoa, Grapes, Loquat, Ramutan	American Samoa	Cooperative research with the University of Hawaii-Hilo is continuing.
A scale Unknown	*Cedrela toona*	American Samoa	This scale is unidentified for the present.
A scarab beetle *Serica anthracina*	Douglas-fir, Ponderosa pine	Northern California	This beetle was again found on Douglas-fir seedlings at the Foresthill Breeding Orchard, Tahoe National Forest.
A short-horned grasshopper *Valanga nigricornis*	Banana, Citrus, Coconut palm, other forest and ornamental trees	Palau - Republic of Palau	Defoliation is variable, but damage has increased overall.
A short-nosed weevil *Lophothetes* sp.	Banana, Mango, many forest and ornamental trees	Palau-Republic of Palau	This weevil continues to be common, but it did not cause serious damage in 1992.
A stick insect *Graeffea crovanii*	Coconut palm	American Samoa	No significant damage was reported, but damage can be serious in some years and locations.

Pacific Southwest Region--Status of insects in California, Hawaii, the Commonwealth of the Northern Mariana Islands, the Federated States of Micronesia, the Republic of the Marshall Islands, the Republic of Palau, the Territory of American Samoa, and the Territory of Guam.

Insect	Host	Locations	Remarks
A termite Unknown	Citrus, Coconut, Betelnut, Mango, Mangrove	Federated States of Micronesia, Marshall Islands	They feed on the wood of living trees.
A tip borer *Unknown*	Mahogany	Federated States of Micronesia	No significant activity was reported in 1992.
A wax scale *Ceroplastes* sp.	*Antidesma bunius*, *Ficus microcarpa*, *Gmelina palawensis*, *Mussaenda* spp., *Spondias pinnata*	Koror - Republic of Palau	Tree branches were heavily covered with the scale and caused the death of small branches.
A whitefly *Aleurodicus destructor*	Banana, Breadfruit, Coconut, Plumeria, and other small trees and shrubs	Marshall Islands	One of a growing list of insect pests.
Agamemnon butterfly *Papilio agamemnon*	*Annona muricata*	Palau - Republic of Palau	It causes the defoliation of new leaves.
Amethyst cedar borer *Semanotus amethystinus*	Incense-cedar, Port-Orford-cedar	Northern California	Amethyst cedar borer and drought appeared to be responsible for dead and dying Port-Orford-cedar near Conant and Sweetbriar, Shasta County. Port-Orford-cedar root disease was not found in the area.
Ash whitefly *Siphoninus phillyreae*	Ornamental trees and shrubs	California	The program of releasing parasites and predators appears to be gaining success in the suppression of this exotic whitefly, first found in July 1988.
Balsam twig aphid *Mindarus abietinus*	White fir	Northern California	This aphid was thought to cause serious damage to 1-0 seedlings at the Placerville Nursery. However, the aphid is now considered a new species (see A Mindarus Twig Aphid).

Pacific Southwest Region--Status of insects in California, Hawaii, the Commonwealth of the Northern Mariana Islands, the Federated States of Micronesia, the Republic of the Marshall Islands, the Republic of Palau, the Territory of American Samoa, and the Territory of Guam.

Insect	Host	Location	Remarks
Banana aphid *Pentalonia nigronervosa*	Banana	Federated States of Micronesia	No significant activity was reported in 1992.
Banana root borer *Cosmopolites sordidus*	Banana, Cocoa	Federated States of Micronesia, Guam, Northern Mariana Islands	The nature of the damage, boring in the corm, makes this borer difficult to control.
Black citrus aphid *Toxoptera aurantii*	Various fruit trees	Federated States of Micronesia	This aphid damages flowers and leaves.
Black citrus swallowtail butterfly *Papilio polytes*	Citrus, Esabella tree	Guam, Northern Mariana Islands, Palau - Republic of Palau	Larvae caused extensive defoliation of young citrus trees in the Marianas; complete defoliation occurred on seedlings in Palau, but it was not classified as a serious problem.
Black cutworm *Agrotis ipsilon*	Douglas-fir, Jeffrey pine	Northern California	Damage at Humboldt Nursery was minor.
Black garden fleahopper *Helticus tibialis*	Cassava, Vegetable crops	Federated States of Micronesia	This insect is found on crops grown in agro-forestry.
Black pineleaf scale *Nuculaspis californica*	Ponderosa pine, Sugar pine	Northern California	High population levels caused visible defoliation of these pines at several widely scattered locations in the southern Cascade Mountains and the Sierra Nevada Range.
Black vine weevil *Otiorhynchus sulcatus*	Douglas-fir, Red fir	Northern California	Damage continued at Humboldt Nursery, but remained spotty over beds.
Blue gum psyllid *Ctenarytaina eucalypti*	Eucalyptus	Coastal and southern California	By May 31, 1992, there were nine new county records of this psyllid. The psyllid has now been found in 23 California counties.
Breadfruit fruitfly *Dacus umbrosus*	Breadfruit	Palau-Republic of Palau	Infestations have decreased recently, but the pest remains common.
California flatheaded borer *Melanophila californica*	Ponderosa pine	Northern California	Drought stress has been served enought that most dead and dying pines have evidence of infestation by this borer. It is also common in dying pine that has been stressed by several years of infestation by the black pineleaf scale.

Pacific Southwest Region--Status of insects in California, Hawaii, the Commonwealth of the Northern Mariana Islands, the Federated States of Micronesia, the Republic of the Marshall Islands, the Republic of Palau, the Territory of American Samoa, and the Territory of Guam.

Insect	Host	Location	Remarks
California oakmoth *Phryganidia californica*	Coast live oak	Northern California	Defoliation occurred at a few locations in Santa Cruz County.
Cedar bark beetles *Phleosinus* sp.	Incense-cedar, Port-Orford-cedar, Redwood	California	Both redwood and Port-Orford-cedar were killed or top-killed following population buildup in blowdown at the edge of a clearcut near Crannell, Humboldt County.
Chinese rose beetle *Adoretus sinicus*	Acerola, Avocado, Banana, Cacao, Chico, Citrus, Grapes, Guava, Loquat, and other tropical fruit and nut trees	American Samoa, Palau - Republic of Palau	American Samoa Community College, together with the University of Hawaii-Hilo, is currently studying integrated pest management methods for control of this beetle on American Samoa. Damage was commonly serious on leaves of banana chenille plants on Palau.
Citrus flower moth *Prays citri*	Citrus	Palau - Republic of Palau	The immature stages feed on flowers and cause galls in the fruit rinds, but at the moment it is not considered a serious problem.
Citrus leafminer *Phyllocnistis citrella*	Citrus	American Samoa, Guam, Palau - Republic of Palau, Northern Mariana Islands	Incidence on young seedlings increased in American Samoa. Heavy infestations are a serious problem in nurseries in Palau.
Citrus mealybug *Planococcus citri*	Banana, Citrus, Pandanus, Soursop	Federated State of Micronesia	Leaves, stems, and fruits are attacked.
Citrus whitefly *Dialeurodes citri*	Citrus	Federated States of Micronesia	Feeding on leaves by nymphs and adults causes affected trees to stop bearing.
Coconut beetle *Brontispa* sp.	Coconut palm	Guam, Federated States of Micronesia	The larvae feed on surfaces of leaflets causing browning and death of leaf tissue.

Pacific Southwest Region--Status of insects in California, Hawaii, the Commonwealth of the Northern Mariana Islands, the Federated States of Micronesia, the Republic of the Marshall Islands, the Republic of Palau, the Territory of American Samoa, and the Territory of Guam.

Insect	Host	Location	Remarks
Coconut hispid beetle *Brontispa longissima*	Coconut palm	American Samoa	Resurgence of this major pest has been noted. Research and controls are to be implemented during 1993.
Coconut leaf beetle *Brontispa chalybeipennis*	Coconut palm	Hawaii	No significant activity was reported in 1992.
Coconut red scale *Furcaspis oceanica*	Coconut palm, *Pandanus* sps.	Palau - Republic of Palau	Heavy infestation results in yellowing and loss of leaves.
Coconut rhinoceros beetle *Oryctes rhinoceros*	Coconut palm	American Samoa, Palau- Republic of Palau	In American Samoa, numbers have increased substantially following Typhoon Vale because fallen trees provide abundant breeding places. In Palau populations fluctuate similarly, but the beetle is under control by biological means.
Coconut scale *Aspidiotus destructor*	Avocado, Banana, Breadfruit, Coconut, Guava, *Fagraea galilai*, Pandanus, Papaya, Soursop, other plants	Federated States of Micronesia, Marshall Islands, Northern Mariana Islands, Palau - Republic of Palau	Leaves of heavily infested plants yellow and fall. Plants under drought stress are particularly susceptible. Damage was spotty in Palau when biological control agents were absent. No significant activity was reported for the Northern Mariana Islands.
Coconut trunk weevil *Rhabdoscelus asperipennis*	Coconut	Northern Mariana Islands, Peleliu - Republic of Palau	No significant activity was reported for the Northern Mariana Islands. The infestation in the southern part of Peleliu decreased during 1992.
Coneworms *Dioryctria baumhoferi* *Diorcytria cambiicola*	Ponderosa pine	Northern California	These coneworms continued to cause damage at the Chico Tree Improvement Center.
Conifer aphids *Cinara* spp.	Ponderosa pine, White fir	Northern and central California	Aphids continued to be abundant at many locales. Scientists involved in an international effort to locate parasitoids of the cypress aphid, *C. cupressi*, made collections from MacNab, Baker and Monterey cypresses in California.

Pacific Southwest Region--Status of insects in California, Hawaii, the Commonwealth of the Northern Mariana Islands, the Federated States of Micronesia, the Republic of the Marshall Islands, the Republic of Palau, the Territory of American Samoa, and the Territory of Guam.

Insect	Host	Location	Remarks
Douglas-fir beetle *Dendroctonus pseudotsugae*	Douglas-fir	Northern California	Attacks on scattered trees infected by black stain root disease occurred primarily in Jackson State Forest, Mendocino County. Blowdown led to attacks on several trees in a two-acre mixed-conifer stand near Crannell, Humboldt County. A minor infestation in a summer home tract at Lake Pillsbury, Lake County, was associated with Armillaria root disease.
Douglas-fir engraver *Scolytus unispinosus*	Douglas-fir	Northern California	Incidence of attacks is down from previous years.
Douglas-fir tussock moth *Orgyia pseudotsugata*	White fir	Northern California	Populations throughout California remain at low, non-damaging levels. Early warning traps at three locations west of Goose Lake, Modoc County, had above normal levels of moths. Increased catches occurred near Fredonyer Pass, Lassen County, and around Burney Mountain, Shasta County. Larval populations in the three areas will be monitored in the spring of 1993.
Douglas-fir twig weevil *Cylindrocopturus furnissi*	Douglas-fir	Northern California	No significant damage was reported in 1992.
Eucalyptus borer *Phoracantha semipunctata*	Eucalyptus	San Francisco Bay Area, and Southern California	Frost damage and the eucalyptus borer appear to be responsible for the decline or death of 100 or so bluegums on Stanford University property. Parasite release programs are anticipated for the Stanford and Palo Alto area.
Eugenia psyllid *Trioza eugeniae*	Eugenia spp., Mountain apple	California, Federated States of Micronesia	This insect causes galls on leaves and infestations can become very abundant. It was found in California in May 1988.
Fall webworm *Hyphantria cunea*	Pacific madrone	Northern California	Defoliation was observed in Humboldt, Lake, Mendocino, Santa Cruz and Sonoma Counties, and was common along the Klamath and Trinity River corridors in Siskiyou and Trinity Counties.

Pacific Southwest Region--Status of insects in California, Hawaii, the Commonwealth of the Northern Mariana Islands, the Federated States of Micronesia, the Republic of the Marshall Islands, the Republic of Palau, the Territory of American Samoa, and the Territory of Guam.

Insect	Host	Location	Remarks
Fir coneworm *Dioryctria abietivorella*	Douglas-fir	Northern California	This coneworm continued to cause extensive damage to the small cone crop at the Chico Tree Improvement Center, Chico, CA.
Fir engraver beetle *Scolytus ventralis*	White fir, Red fir	California	Mortality decreased in north coastal areas, but overall this was probably the most significant forest insect in California in 1992. Mortality dramatically increased in portions of Lassen, Modoc, Shasta and Siskiyou counties. True fir mortality in excess of 50 percent of the trees was not uncommon on some of the most heavily impacted sites. Extensive mortality also continued from Lassen County southward to Lake Tahoe. Top-kill and mortality continued at above-normal levels in the mixed-conifer and true fir stands of the Sierra Nevadas. In southern California, white fir mortality appeared to increase at Mt. Palomar, San Diego County.
Fir flatheaded borer *Melanophila drummondi*	Douglas-fir	Northern California	Incidence appeared comparable to 1991 in southwestern Trinity, southeastern Humboldt and northeastern Mendocino Counties. In the Sierras, this wood borer was commonly found in association with the fir engraver in white fir mortality throughout the westside mixed-conifer and true fir types.
Florida wax scale *Ceroplastes floridensis*	*Mussaenda frondosa*	Palau - Republic of Palau	This is the first record of this scale in Palau. The list of potential host plants is extensive.
Formosan termite *Coptotermes formosanus*	California pepper tree, Wood in use	Southern California	This serious termite pest was found for the first time attacking a California residence in the La Mesa area, San Diego County. A visual survey on adjacent properties found Formosan termites in wood piles and in live California pepper trees on three properties.
Fruit-piercing moth *Othreis fullonia*	Banana, Carambola, Citrus, Coral tree, Eggplant, Guava, Mango, Papaya, Tomato	American Samoa, Guam, Kosrae and Pohnpei-Federated States of Micronesia, Northern Mariana Islands	Study of biological control by existing parasites continues on American Samoa. Feeding by the moth caused the major problem of fruit drop throughout Kosrae and Pohnpei. No significant activity was reported from the Northern Mariana Islands.

Pacific Southwest Region--Status of insects in California, Hawaii, the Commonwealth of the Northern Mariana Islands, the Federated States of Micronesia, the Republic of the Marshall Islands, the Republic of Palau, the Territory of American Samoa, and the Territory of Guam.

Insect	Host	Location	Remarks
Fruittree leafroller *Archips argyrospila*	California black oak, other hardwoods	Southern California	Significant defoliation of California black oak and some defoliation of coast live oak were observed in the San Bernardino Mountains.
Gouty pitch midge *Cecidomyia piniinopis*	Ponderosa pine	Northern California	Both planted and natural ponderosa pine ranging in size from seedlings to pole-size trees were infested. Drought stress probably increased the number of tips which died from infestation.
Grasshoppers **Acrididae**	Douglas-fir	Southern California	Populations were high on the Cleveland National Forest, San Diego County. Seedling Englemann and coast live oaks were defoliated on the Palomar Ranger District. Damage to range grasses caused concern amoung permittees. Higher populations are expected in 1993.
Green scale *Coccus viridus*	Banana, Citrus, Mango, Plumeria, Soursop	Federated States of Micronesia	No significant activity was reported in 1992.
Gypsy moth *Lymantria dispar*	Hardwoods, ornamentals	California	Approximately 21,000 traps captured nine moths in nine counties, one of which was at the Sweetwater Campground, Stanislaus National Forest, Tuolumne County.
Inornate scale *Aonidiella inorata*	Banana, Breadfruit, Citrus, Coconut	Federated States of Micronesia	This is one of the major pests of the island fruit crop.
Jeffrey pine beetle *Dendroctonus jeffreyi*	Jeffrey pine	California	Scattered older Jeffrey pines were killed near and within Lassen Volcanic National Park. Severe drought, beetles and an understory of white fir combined to cause mortality near Pole Springs and Ashurst Lake, Lassen County. Mortality of Jeffrey pine continued at above-normal levels in the Lake Tahoe Basin.
Jeffrey pine needleminer *Coleotechnites* sp.	Jeffrey pine	California	No significant activity was reported in 1992.

Pacific Southwest Region--Status of insects in California, Hawaii, the Commonwealth of the Northern Mariana Islands, the Federated States of Micronesia, the Republic of the Marshall Islands, the Republic of Palau, the Territory of American Samoa, and the Territory of Guam.

Insect	Host	Location	Remarks
Latania scale *Hemiberlesia lataniae*	Banana, Breadfruit, Citrus, Mango, Pandanus	Federated States of Micronesia	No significant activity was reported in 1992.
Leucaena psyllid *Heteropsylla cubana*	*Leucaena* spp., *Samanea saman*, Tangan-tangan	Guam, Northern Mariana Islands, Southern California	No significant activity was reported for the Northern Mariana Islands. This psyllid was collected for the first time in Los Angeles County in May 1992. It was first found in California in Orange County in August 1986. Possible economic potential in California is not known at this time.
Lodgepole needleminer *Coleotechnites milleri*	Lodgepole pine	Yosemite National Park	The 1992 survey in the Tuolumne Meadows Region of the Park found that the population was too low to cause visible defoliation. However, there was a sharply rising trend. Two plots, May Lake and Olmstead #1, had extremely high population densities.
Mango shoot caterpillar *Bombotelia jocosatrix*	Cashew, Mango	Guam, Northern Mariana Islands	New leaves were damaged.
Matsucoccus scale *Matsucoccus* sp.	Ponderosa pine	Northern California	A small number of pines in Lake County exhibited branch flagging.
Melon aphid/ cotton aphid *Aphis gossypii*	Banana, Breadfruit, Cocoa, Mango, Mountain apple, Papaya, Plumeria	Federated States of Micronesia	This is a pest of many agro-forestry crops.
Melon fly *Dacus cucurbitae*	Avocado, Northern Figs, Mango	Guam, Federated Mariana Islands	Guam and the Northern Mariana Islands will begin the importation and release of sterile males from Okinawa in 1994 in an attempt to eradicate of this pest.
Modoc budworm *Choristoneura retiniana*	White fir	Northeastern California	Populations expanded unexpectedly in Modoc County. About 80,000 acres of white fir were affected, with about 26,000 acres heavily defoliated.

Insect	Host	Location	Remarks
Mountain apple psyllid *Trioza vitiensis*	*Eugenia malaccensis*	Republic of Palau	No significant activity was reported in 1992.
Mountain pine beetle *Dendroctonus ponderosae*	Lodgepole pine, Ponderosa pine, Sugar pine	California	Sugar pine mortality scattered across northern California was a result of drought, mountain pine beetle and black pineleaf scale. The beetle continues to kill lodgepole pine around meadows on the Goosenest District, Klamath National Forest, and in the Thousand Lake Wilderness, Shasta County. Drought, black pineleaf scale, fire and the beetle have contributed to mortality of ponderosa pine on Timber Mountain, Modoc County. In the Sierra Nevada, mortality of sugar pine caused by mountain beetle appeared to decline throughout the westside when compared with the last two years.
Myrobalan butterfly *Badamia exclamationis*	*Terminalia catappa*, *Pongamia pinnata*	Koror - Republic of Palau	Defoliation was observed.
Nantucket pine tip moth *Rhyacionia frustrana*	Monterey pine	Central and southern California	No significant activity was reported in 1992.
Oak pit scale *Asterolecanium minus*	Coast live oak	Northern California	No significant activity was reported in 1992.
Orange spiny whitefly *Aleurocanthus spiniferus*	Breadfruit, Citrus	Federated States of Micronesia	This whitefly has been a major pest.
Palau coconut beetle *Brontispa palauensis*	Coconut palm	Palau - Republic of Palau	This beetle feeds within unopened fronds, and affected leaves turn brown upon opening. It is not a serious pest at present.
Palm Scale *Hemiberlesia palmae*	Betelnut, Breadfruit, Citrus	Federated States of Micronesia	No significant activity was reported in 1992.

Pacific Southwest Region--Status of insects in California, Hawaii, the Commonwealth of the Northern Mariana Islands, the Federated States of Micronesia, the Republic of the Marshall Islands, the Republic of Palau, the Territory of American Samoa, and the Territory of Guam.

Insect	Host	Location	Remarks
Pandanus beetle *Oxycephala pandani*	*Pandanus* spp.	Republic of Palau	No significant activity was reported in 1992.
Pine engraver beetle *Ips* spp.	Pines	California	Various pine engravers were involved in scattered mortality or top-kill of ponderosa and knobcone pine throughout northern California. Activity in the Sierra Nevada was scattered throughout much of the pine and mixed-conifer types. In southern California, engravers were abundant in slash, but top-kill of nearby trees was not observed, probably because of favorable growing conditions. High mortality of Coulter pine was found at a plantation near Mt. Palomar, San Diego County. *I. confusus* and black stain root disease continued to cause mortality of singleleaf pinyon pine in the San Bernadino Mountains.
Pine reproduction weevil *Cylindrocopturus eatoni*	Ponderosa pine	California	Only one report from Nevada County was submitted by field foresters.
Poinciana looper *Pericyma cruegeri*	Flame tree, Yellow poinciana	Guam, Northern Mariana Islands, Palau & Koror - Republic of Palau	It is destructive during the rainy season on Guam. Recently introduced into Palau, defoliation was common in Koror and populations have increased slightly. No significant activity was reported in the Northern Mariana Islands.
Protens scale *Parlatoria protens*	Betelnut, Citrus, Coconut, Mango, Pandanus	Federated States of Micronesia	No significant activity was reported in 1992.
Redbanded thrips *Selenothrips rubrocinctus*	Avocado, Cashew, Cocoa, Mango	Guam, Northern Mariana Islands, Republic of Palau	No significant activity was reported from the Northern Marianas. Leaf scarification was common in Palau because populations have increased slightly.

Insect	Host	Location	Remarks
Red turpentine beetle *Dendroctonus valens*	Pines	California	This beetle attacked diseased and drought-stressed Monterey pines throughout the North Coast Region. Much of the ponderosa and Jeffrey pine mortality in 1992 involved heavy attacks by this beetle, with attacks from below ground line to as much as 10 feet above. In the Sierras, attacks were often associated with the western pine beetle in ponderosa pine, and sugar pines were frequently the host in the southern Sierras.
Roundheaded fir borer *Tetropium abietis*	Red fir, White fir	California	Mortality of red fir continued in Lassen Volcanic National Park. Although mortality of red fir is low to moderate in many other areas, many trees have incipient infestations. This woodborer was commonly found in association with the fir engraver in fir mortality throughout the westside mixed-conifer and true fir types in the Sierra Nevada Mountains.
Sequoia pitch moth *Vespamina sequoiae*	Monterey and other pines	Coastal Northern California	This insect continued to be a pest of ornamental Monterey pine throughout the North Coast Region. Many infested trees are attacked by the red turpentine beetle.
Silverspotted tiger moth *Halisodota argentata*	White fir	Northern California	No significant activity was reported in 1992.
Spider mites *Tetranychus* spp.	Cassava, , Papaya, Ornamentals	Palau - Republic of Palau	Serious yellowing and defoliation occurred on papaya and cassava leaves, and on ornamentals.
Spiraling whitefly *Aleurodicus dispersus*	Banana, Cassava, Coconut, Guava, Papaya, Other fruit and shrub trees	American Samoa, Guam, Chuuk-Federated States of Micronesia, Northern Mariana Islands, Republic of Palua	Damage can be serious in American Samoa when the biological control complex breaks down. Parasites and predators appear to keep this whitefly in check on Palau. Similarly, a ladybird beetle and an encarsia wasp are used in the Marianas.

Pacific Southwest Region--Status of insects in California, Hawaii, the Commonwealth of the Northern Mariana Islands, the Federated States of Micronesia, the Republic of the Marshall Islands, the Republic of Palau, the Territory of American Samoa, and the Territory of Guam.

Insect	Host	Location	Remarks
Spruce aphid *Elatobium abietinum*	Sitka spruce	Coastal Northwestern California	Damage to planted and native Sitka spruce along coastal Humboldt County is about the same as 1991.
Spruce beetle *Dendroctonus rufipennis*	Sitka spruce	Northwestern California	No further mortality pockets occurred near Patrick's Point State Park, Humboldt County.
Strawberry root weevil *Otiorhynchus ovatus*	Douglas-fir, Red fir	Northern California	Damage at Humboldt Nursery appeared to decline.
Sugar pine tortrix *Choristoneura lambertiana*	Lodgepole pine	Northern California	No significant activity was reported in 1992.
Tent caterpillar *Malacosoma* sp.	Antelope bitterbrush	Eastern California	Populations continued at very low levels throughout Inyo and Mono Counties.
Twig beetles *Pityophthorus* spp.	Douglas-fir, Ponderosa pine, White fir	Southern California	Slight damage to saplings of Jeffrey pine in a plantation on Franzier Mountain, Ventura County.
Western pine beetle *Dendroctonus brevicomis*	Coulter pine, Ponderosa pine	California	Mortality was scattered on the North Coast, but ponderosa pine mortality, caused by drought and western pine beetle, increased in northern California in 1992. The same agents continued to cause above-normal levels of mortality throughout most of the lower- to mid-elevation westside pine and mixed-conifer stands in the Sierra Nevada. Mortality occurred in scattered small group kills (fewer than 10 trees) and also extensively within specific drainages. In southern California, mortality associated with this beetle was less than that of recent years. The decline is attributed to good soil moisture from rainfall in March 1991 and the winter of 1991-1992.
Western pine shoot borer *Eucosma sonomana*	Ponderosa pine	Northern California	No significant activity was reported in 1992.
White fir needleminer *Epinota meritana*	Whide fir	Northern California	No significant activity was reported in 1992.

Pacific Southwest Region--Status of insects in California, Hawaii, the Commonwealth of the Northern Mariana Islands, the Federated States of Micronesia, the Republic of the Marshall Islands, the Republic of Palau, the Territory of American Samoa, and the Territory of Guam.

Insect	Host	Location	Remarks
White fir sawflies *Neodiprion* spp.	White fir	Northern California	Outbreaks of white fir sawflies occurred at several locations in Lassen, Modoc and Plumas Counties. Sapling, pole-size and the lower crowns of some mature trees were involved.
Woolly whitefly *Aleurothrixus floccosus*	Cherry, Citrus, Guava	Guam, Northern Mariana Islands	This pest is an introduction from tropical and subtropical America.

Pacific Southwest Region Diseases

Prepared by Susan J. Frankel

Disease	Host	Location	Remarks
Stem and Branch Diseases			
Botryosphaeria canker *Botryosphaeria ribis*	Ceanothus, Chamise, Manzanita	Southern California	The fungus is associated with dieback of chaparral in many counties in southern California. The plants are predisposed to fungal infection by drought and air pollution. The dead brush plants pose a severe fire hazard.
	Coast redwood, Giant sequoia	Northern California	In northern California the fungus is killing branches and tops of redwood and sequoias planted at low-elevation dry sites.
Citrus canker *Xanthomonas* sp.	Citrus	Yap, Palau	This disease has severely limited the survival of citrus trees on many islands in the western Pacific.
Dwarf mistletoes *Arceuthobium* spp.	Douglas-fir, Pines, True firs	California	The abundance and distribution of dwarf mistletoes changes only gradually over time. Mistletoes infected conifers on about 2.4 million acres of commercial land, and contributed to an estimated 100 million cubic feet of mortality. Dwarf mistletoe was associated with branch flagging in red fir and white fir throughout the central and southern Sierra Nevadas. Drought stress, bark beetles, and cytospora canker were contributory factors in this pest complex.
Fusicoccum canker *Fusicoccum* sp.	Pacific madrone	Northern California Coast	The fungus caused branch dieback and cankers on madrone throughout much of northern California.
Pitch canker *Fusarium subglutinans*	Monterey pine	Alameda, Los Angeles, Monterey, Santa Barbara and Santa Cruz Counties, California	The disease is slowly expanding in these counties. The fungus has not been found in native pine stands; only roadside, park, and Christmas tree farm and other ornamental plantings are affected.

Pacific Southwest Region--Status of diseases in California, Hawaii, the Commonwealth of the Northern Mariana Islands, the Federated States of Micronesia, the Republic of the Marshall Islands, the Republic of Palau, the Territory of American Samoa, and the Territory of Guam.

Disease	Host	Location	Remarks
Phomopsis canker *Phomopsis lokoyae*	Douglas-fir	Northern California	The fungus was involved in branch flagging and top-killing of sapling and pole-sized trees in overstocked or brushy areas. Damage appears to be drought-related.
True mistletoe *Phoradendron* spp.	Oaks, Sycamores, Other hardwoods	California	True mistletoes continue to reduce host vigor by taking moisture and nutrients from their hosts. Infections are common throughout the state.
Western gall rust *Peridermium harknessii*	Bishop pine, Lodgepole pine, Monterey pine, Ponderosa pine	Northern California	This rust caused branch flagging on larger trees and mortality of smaller regeneration trees.
White fir mistletoe *Phoradendron bolleanum* ssp. *pauciflorum*	White fir	Central and southern California	This parasitic plant is widespread in forest stands throughout the southern part of the state.
White pine blister rust *Cronartium ribicola*	Sugar pine, Western white pine	Central and northern California	Blister rust is infecting white pines throughout the Sierra Nevada and Coast Ranges. Low levels of blister rust were observed on *Ribes* sp. throughout northern California early in the season, but due to dry conditions, levels did not increase during the summer.
Root Diseases			
Annosus root disease *Heterobasidion annosum*	Conifers, Some hardwoods	California	About 1.5 million acres of pine type and 0.7 million acres of true fir type were infected with this root and butt rot.
Armillaria root disease *Armillaria* sp.	Conifers, Some hardwoods	California	The disease is widespread in ornamental plantings. It is also damaging in some native stands that contain oak species.
Black stain root disease *Leptographium wageneri*	Douglas-fir, Jeffrey pine, Pinyon pine, Ponderosa pine	California	Douglas-fir plantations in northwestern California are being damaged by black stain root disease. Thousands of mature Jeffrey, ponderosa and pinyon pine trees have also died due to black stain.
Brown root disease *Phellinus noxious*	Flame tree	Northern Mariana Islands	This disease was previously called "Flame tree root disease." It continues to kill high-visibility trees in naturalized stands in Saipan and Rota. Planted trees have not been affected. A survey is being done to determine the extent and distribution of damage.

Pacific Southwest Region--Status of diseases in California, Hawaii, the Commonwealth of the Northern Mariana Islands, the Federated States of Micronesia, the Republic of the Marshall Islands, the Republic of Palau, the Territory of American Samoa, and the Territory of Guam.

Disease	Host	Location	Remarks
Norfolk Island pine decline *Ganoderma* sp.	Norfolk Island pine	Hawaii	This fungus causes mortality and tree dieback in discrete centers within planted stands. Damage was recently determined to be due to a species of *Ganoderma*.
Port-Orford-cedar root disease *Phytophthora lateralis*	Port-Orford-cedar, Pacific yew	Northern California	This disease remains limited to the Smith River drainage in California (Del Norte County), except for a few trees on the Siskiyou National Forest (Siskiyou County). The infected yew are located adjacent to sick Port-Orford-cedar trees.
Foliage Diseases			
Elytroderma needle disease *Elytroderma deformans*	Jeffrey pine, Ponderosa pine	California	This perennial foliage disease continues to cause brooming and needle loss in yellow pines. It predisposes trees to bark beetle injury resulting in premature mortality for thousands of trees.
Vascular Wilts			
Dutch elm disease *Ceratocystis ulmi*	Elm	San Francisco Bay Area, Sacramento, California	Several new areas with Dutch Elm Disease were identified throughout nine counties in California. Identifications of 296 new infected elms were made in 1992, among the highest ever recorded.
Nursery Diseases			
Alder leaf spot *Septoria alnifolia*	Red alder, White alder	Northern California	Damage due to Septoria was minimized by fungicide applications.
Cedar leaf blight *Didymascella thujina*	Western red cedar	Northern California	2-0 and P-1 cedar were partially defoliated by this fungus. Damage was more severe than in 1991.
Fusarium diseases *Fusarium* spp.	Douglas-fir, Ponderosa pine, Sugar pine, True fir and others	California	In an unfumigated field, seeded with Douglas-fir and red fir, *Fusarium* and *Phoma* killed thousands of seedlings. In an adjacent fumigated field, damage was minor. Losses to hypocotyl rot were also as high as 30 percent of the crop.

Pacific Southwest Region--Status of diseases in California, Hawaii, the Commonwealth of the Northern Mariana Islands, the Federated States of Micronesia, the Republic of the Marshall Islands, the Republic of Palau, the Territory of American Samoa, and the Territory of Guam.

Disease	Host	Location	Remarks
Phoma blight *Phoma* spp.	Douglas-fir, Red fir	Northern California	Level of Phoma blight infection remains low, causing minor damage. However, there was one unfumigated field where mortality due to *Fusarium* and *Phoma* was high. See Fusarium diseases.
Sirococcus tip blight *Sirococcus strobilinus*	Jeffrey pine	Northern California	Tip blight deformed and killed thousands of Jeffrey pine.
Abiotic Damage			
Drought and heat injury	Conifers, Some hardwoods	California	White fir mortality has been especially severe in mixed conifer sites of northeastern California. Sugar pine, redwood, oaks, manzanita and other species are also dying prematurely due to lack of moisture.
Freeze injury	Conifers	Northern California	Damage due to cold temperatures was less prevalent than it has been over the past few years. Winter desiccation, caused by cold temperatures, low snow pack and drying winds killed hundreds of ponderosa pine in the northern half of the state.
Ozone injury	Jeffrey pine, Ponderosa pine	Central and southern California	The amount of visible foliar ozone injury to pines in the southern Sierra Nevada has decreased over the last 7 years. This coincides with a period of drought stress that presumably causes ponderosa pine and Jeffrey pine to reduce their photosynthetic activity and take up less ozone. However, many pines are dying from this lack of moisture.
Salt damage	Conifers, Shrubs	Northern California	Burn caused by run-off of salts used for road de-icing was limited to small, localized areas.
Typhoon damage	Eucalyptus Koa, Ohia, Palm	Guam, Hawaii	160 mile-per-hour winds uprooted, defoliated and broke tops out of plantation and native trees on over 5,000 acres. Fire, flood and insect infestation hazard is high in many areas.
Other Diseases			
Koa tree decline *Unknown*	Koa	Hawaii	Sudden death of koa continues along hillsides on Oahu Island. *Fusarium*, a beetle borer, and a leaf hopper are suspected to be interacting to cause tree mortality.

Pacific Southwest Region--Status of diseases in California, Hawaii, the Commonwealth of the Northern Mariana Islands, the Federated States of Micronesia, the Republic of the Marshall Islands, the Republic of Palau, the Territory of American Samoa, and the Territory of Guam.

Disease	Host	Location	Remarks
Mamane tree decline *Unknown*	Mamane	Hawaii	Common on Hawaii island, this decline causes branch dieback, brooming, and swelling of stems.
Uluhe fern die-off *Unknown*	Uluhe fern	Hawaii	A leafhopper and mycoplasma are associated with this die-off. Uluhe fern is a native plant which serves as quick cover for scarred lands.

Pacific Northwest Region Insects

Prepared by Keith Sprengel

Insect	Host	Location	Remarks
Douglas-fir beetle *Dendroctonus pseudotsugae*	Douglas-fir	Oregon, Washington	Douglas-fir beetle activity increased significantly throughout the Region, most notably on forested lands west of the Cascade crest. Affected areas increased from 103,021 acres in 1991 to 171,951 acres in 1992 (an average of one tree killed per acre). Most significant increases occurred on the Mt. Hood, Willamette and Umatilla National Forests. Drought and root diseases contributed to host susceptibility.
Douglas-fir tussock moth *Orgyia pseudotsugata*	Douglas-fir, True firs	Eastern Oregon	Aerial survey detected 7,546 acres affected by Douglas-fir tussock moth; approximately 6,000 acres affected were on the Malheur National Forest. Early warning trapping and population sampling in the summer and fall of 1992 indicated that the population has collapsed in most areas. Minor amounts of visible defoliation could occur in 1993. No Regionwide outbreaks are expected in 1993. Observation of defoliation could have been obscured due to its concurrence with defoliation caused by western spruce budworm. Observable signs of defoliation were also destroyed by an early summer hail and rain storm in parts of eastern and northeastern Oregon.
Fir engraver beetle *Scolytus ventralis*	True firs	Oregon, Washington	Fir engraver activity in Washington decreased from 146,542 acres in 1991 to 17,998 acres in 1992. In Oregon it decreased from 397,985 acres to 307,457 acres. Most notable population levels occurred in central and south-central Oregon, however, a slight over-all average decrease occurred in these areas. The most significant detected increase was on the Malheur National Forest (26,346 acres in 1991 to 74,716 acres in 1992).

Pacific Northwest Region--Status of insects in Oregon and Washington.

Insect	Host	Location	Remarks
Gypsy moth (European form) *Lymantria dispar*	Conifers, Hardwoods	Oregon, Washington	Five hundred acres were treated with *Bacillus thuringiensis* three times near Cave Junction, Oregon. Two 70-acre areas were treated three times from the ground (one in Mt. Vernon, Washington, and one in Colville, Washington). Fourty-seven adult gypsy males were trapped in Oregon and 454 were trapped in Washington. None was identified as the Asian strain. Detection trapping will continue throughout Oregon and Washington in 1993. Thirteen sites in Washington and four sites in Oregon are proposed for ground treatment in 1993; one 450-acre site in Oregon is proposed for aerial treatment.
Gypsy moth (Asian form) *Lymantria dispar*	Conifers, Hardwoods	Oregon, Washington	After Asian gypsy moth egg masses were detected on Siberian grain ships in 1991, gypsy moth trapping was increased around port areas in Washington and Oregon. Nine Asian gypsy moths were trapped near port areas in Tacoma, Washington, and one Asian gypsy moth was trapped in North Portland near St. Johns, Oregon. In 1992, 116,000 acres near Tacoma, and 8,000 acres in Portland were treated three times from the air with *Bacillus thuringiensis* at 24 BIUs per acre. Trapping for adult males will continue in 1993, focusing on 1992 treatment areas and port areas.
Modoc budworm *Choristoneura viridis*	Douglas-fir, True firs	Southern Oregon	Region-wide defoliation totaled 29,665 acres; 28,718 acres of defoliation were within the Fremont National Forest flight area and 947 acres were on the Winema National Forest.
Mountain pine beetle *Dendroctonus ponderosae*	Jeffrey pine, Lodgepole pine, Ponderosa pine, Sugar pine, Western white pine	Oregon, Washington	Acres affected by mountain pine beetle increased from 405,055 acres in 1991 to 428,325 acres in 1992. The most dramatic increase occurred in sugar pine on the Fremont and Winema National Forests (from 2,341 acres in 1991 to 39,705 acres in 1992), representing one tree killed in every five acres. Other areas experiencing high levels of activity included the Malheur National Forest, northeastern Oregon and northeastern Washington.

Pacific Northwest Region--Status of insects in Oregon and Washington.

Insect	Host	Location	Remarks
Pandora moth *Coloradia pandora*	Lodgepole pine, Ponderosa pine	Oregon	Pandora moth activity was detected on 77,972 acres of the Deschutes National Forest. Numerous larvae were detected during a ground survey on the Silver Lake District in an area not detected from the air. A random ground survey estimated that approximately 60 percent of the larvae on the Silver Lake Ranger District were parasitized by *Apanteles* wasps.
Pine engraver beetles *Ips* spp.	Poderosa pine	Oregon, Washington	Pine engraver activity showed a significant increase from 1991 (2,651 acres in 1991 and 15,653 acres in 1992). Over 14,000 acres of the observed engraver activity occurred in Oregon, with 10,394 acres on the Ochoco National Forest.
Spruce beetle *Dendroctonus rufipennis*	Engelmann spruce	Oregon, Washington	Spruce beetle affected 559 acres, a significant decrease from the 24,100 acres reported in 1991. Decrease of the spruce beetle population can be attributed largely to a lack of suitable host material.
Western pine beetle *Dendroctonus brevicomis*	Ponderosa pine	Oregon, Washington	Reported affected acres increased from 64,200 acres in 1991 to 232,681 acres in 1992 (killing approximately three trees in every five acres). Although the entire Region experienced an increase, Oregon had an eight-fold increase in the reported acres. Fourty-four percent of the reported occurrence was in pole-sized timber. Highest activities were detected on the Malheur and Fremont National Forests. Spot ground checks on the Okanogan National Forest suggest that some areas reported affected by mountain pine beetle, were actually affected by western pine beetle.

Pacific Northwest Region--Status of insects in Oregon and Washington.

Insect	Host	Location	Remarks
Western spruce budworm *Choristoneura occidentalis*	Douglas-fir, Engelmann spruce, True firs, Western larch	Oregon, Washington	Areas of visible defoliation decreased from 4.75 million acres in 1991 to 3.28 million acres acres in 1992. The most significant decrease occurred in Oregon. The observed signs of defoliation in eastern and northeastern Oregon were destroyed in some areas by an early summer hail and rain storm. The decrease in defoliated areas may also be due to budworm population declines due to disrupted larval diapause caused by a warm fall, unusually warm, short winter, and an early warm spring, and asynchrony between development of larvae and host foliage. An aerial suppression project was conducted on 116,344 acres of the Wallowa-Whitman and Umatilla National Forests.

Pacific Northwest Region Diseases

Prepared by Ellen Michaels Goheen

Disease	Host	Location	Remarks
Stem and Branch Diseases			
Branch cankers *Phomopsis* spp. *Sclerophoma* spp. *Dermea* spp. *Cytospora* spp.	Douglas-fir, True firs	Oregon, Washington	Top, branch and whole-tree mortality associated primarily with drought and secondarily with complexes of canker fungi occurred in plantations and pole-size stands across Washington and Oregon. Canker fungi were found in association with true fir dwarf mistletoe throughout the Region.
Dwarf mistletoes *Arceuthobium* spp.	Various conifers	Oregon, Washington	The impact from dwarf mistletoes in Washington and Oregon changes little from year to year; however, long-term losses in unmanaged stands are great. All conifer species are affected to some degree. Most of the damage occurred east of the Cascade crest. Douglas-fir dwarf mistletoe was the most damaging tree disease in stands east of the Cascades. Western larch dwarf mistletoe causes serious damage in northcentral Washington and northeastern Oregon.
Stem decay *Phellinus pini* *Echinodontium tinctorium* Other Basidiomycetes	Various conifers	Oregon, Washington	Stem decay fungi still consume enormous volumes of wood. Most losses occurred in younger stands on thin-bark species, which are susceptible to wounding during stand entries. Wounding of residual trees both activates dormant infections and creates excellent infection courts.
White pine blister rust *Cronartium ribicola*	Sugar pine, Western white pine	Oregon, Washington	White pine blister rust caused mortality throughout the range of western white pine and sugar pine, and prevented the management of susceptible trees on high-hazard sites. Annual losses in Oregon and Washington are estimated to be 15 million cubic feet. Rust-resistant planting stock is available for regenerating stands. Interest in pruning white pine stands continues to increase.

Pacific Northwest Region--Status of diseases in Oregon and Washington.

Disease	Host	Location	Remarks
Root Diseases			
Root disease	Various conifers	Oregon, Washington	Root diseases are among the most serious pest problems in Oregon and Washington forests because of the magnitude of losses and the difficulty of treatment. Recognizing root disease in forest stands continues to be a data acquisition concern although reports of root disease incidence increase as use of stand examinations to detect root disease increase. Annual losses to root diseases on all ownerships are estimated at over 185 million cubic feet. Tolerant and immune tree species were planted on some affected sites to limit future losses.
Annosus root disease *Heterobasidion annosum*	True firs, Ponderosa pine, Western hemlock	Oregon, Washington	Annosus root disease was responsible for extensive losses in many partially-cut white and grand fir stands in southern and eastern Oregon and eastern Washington. Mortality was high where annosus root disease and fir engraver beetles operate as a complex. Evidence points to extensive infection throughout eastern portions of the Region. Many stands were harvested 10- to 20-years ago and the fungus is currently spreading to trees surrounding those stumps. Disease severity in these conditions is expected to increase with time. Annosus root disease was observed with increasing frequency in predominantly ponderosa pine stands on dry sites in eastern Washington and eastern Oregon. Concern regarding the impacts of annosus root disease on mountain hemlock and Pacific silver fir in high-elevation stands in the Cascades increased. Over the Region, use of borax as a stump protectant to prevent annosus root disease on susceptible conifers increased.

Pacific Northwest Region--Status of diseases in Oregon and Washington.

Disease	Host	Location	Remarks
Armillaria root disease *Armillaria ostoyae*	Various conifers	Oregon, Washington	The most serious losses to this disease occurred east of the Cascades in mixed-conifer stands. In some stands in northeastern Oregon where soils are compacted or displaced, mortality was high. In localized areas, ponderosa pine was seriously damaged. Losses west of the Cascades were usually confined to young, often stressed trees. Planting or favoring tolerant or resistant species was recommended as a control measure.
Laminated root rot *Phellinus weirii*	Douglas-fir, Grand fir, White fir	Oregon, Washington	Laminated root rot was the most serious forest tree disease west of the Cascades in Washington and Oregon. Where the disease occurs, Douglas-fir and true fir productivity has been reduced 50 percent. West of the Cascade Mountains, an estimated 8 percent of the area in susceptible species is affected. In some locations, surveys indicate that 15-20 percent of the area available for timber management requires treatment to minimize losses from this disease. East of the Cascades, reports of laminated root rot increased as awareness increased. Grand and white fir stands experienced severe damage. Tolerant, resistant and immune species were favored or planted.
Port-Orford-cedar root disease *Phytophthora lateralis*	Port-Orford-cedar, Pacific yew	Southwestern Oregon	Port-Orford-cedar root disease causes mortality of Port-Orford-cedar in southwestern Oregon. Approximately 12,200 acres containing diseased trees were mapped during the annual aerial detection survey. Resistance to the fungus is being tested using artificial inoculation techniques. Occurrence of the fungus on Pacific yew has thus far been limited to locations where Port-Orford-cedar and yew are intermingled within the same project areas.
Tomentosus root rot *Inonotus tomentosus*	Engelmann spruce	Oregon, Washington	Tomentosus root and butt rot was found commonly in stands dominated by mature and older Engelmann spruce. Trees are predisposed to windthrow or collapse but are seldom killed outright.

Pacific Northwest Region--Status of diseases in Oregon and Washington.

Disease	Host	Location	Remarks
Vascular Wilts and Declines			
Black stain root disease *Ophiostoma wageneri* (=*Leptographium wageneri*)	Douglas-fir, Ponderosa pine	Oregon, Washington	In southwestern Oregon, black stain root disease was the most commonly encountered disease in Douglas-fir plantations. It was particularly damaging where disturbances, such as road building or soil compaction, had occurred or where roadside Douglas-fir was cut by mechanical choppers. Black stain root disease on ponderosa pine was observed with increasing frequency in eastern Oregon. Numerous centers were located on the Malheur, Ochoco and Fremont National Forests.
Foliage Diseases			
Dothistroma needle blight *Mycosphaerella pini* [*Dothistroma septospora* (=*Dothistroma pini*)] **Douglas-fir needle cast** *Rhabdocline pseudotsugae* **Elytroderma needle disease** *Elytroderma deformans* **Larch needle cast** *Meria laricis* **Swiss needle cast** *Phaeocryptopus gaeumannii*	Douglas-fir, Lodgepole pine, Ponderosa pine	Oregon, Washington	The incidence of several foliage diseases decreased from 1991 levels due to drier microclimatic conditions during the spring.

Pacific Northwest Region--Status of diseases in Oregon and Washington.

Disease	Host	Location	Remarks
Nursery Diseases			
Damping-off	Most conifers	Oregon, Washington	Loss of seedlings before and shortly after emergence averaged approximately one percent in two Pacific Northwest bareroot nurseries. Fumigation, deep watering and delayed fertilization helped control damping-off.
Douglas-fir canker diseases *Botrytis cinerea* *Fusarium roseum* *Phoma eupyrena* *Phomopsis* spp.	Douglas-fir	Oregon, Washington	Damage was scattered, with less than one percent of crop lost in most nurseries. Fungicide applications were helpful when cankers were above ground and not covered with soil collars.
Fusarium root and hypocotyl rots *Fusarium oxysporum*	Douglas-fir, Ponderosa pine, Sugar pine, Western larch	Oregon, Washington	Scattered losses for most species at two nurseries. Partly due to a mild winter and hot weather during sowing. Fusarium damping-off and later hypocotyl rot destroyed over 50 percent of several conifer species in one field at one nursery.
Gray mold *Botrytis cinerea*	Douglas-fir	Oregon, Washington	Damage by gray mold has been kept low (less than one percent of the crop damaged) through applications of preventative fungicide treatment, regulation of seedbed densities and prompt removal of dead material, including pruned tops, from nursery beds.
Larch needle cast *Meria laricis*	Western larch	Washington	Isolated pockets of severe defoliation resulted in less than 10 percent loss at one nursery.
Phytophthora root rot *Phytophthora* spp.	Douglas-fir, Other conifers	Oregon, Washington	Seedbed seedling damage was confined primarily to nursery beds with poor drainage or compaction layers in the rooting zone. Soil wrenching maintained a well-drained, loose soil profile at one nursery, nearly eliminating *Phytophthora* problems.

Pacific Northwest Region--Status of diseases in Oregon and Washington.

Southern Region Insects

Prepared by Roberta A. Fitzgibbon and James R. Rhea

Insect	Host	Location	Remarks
Ambrosia beetle *Xyleborus* spp.	Hardwoods, Pines	South Carolina	Infestations in woodyards in the Hurricane Hugo-damaged area (1989) were less severe than in 1991.
Bagworms *Thyridopteryx ephemeraeformis*	Bald cypress, Eastern redcedar, Evergreen ornamentals, Spruce	Regionwide	Light infestations were reported in North Carolina. Increased activity reported in central Tennessee.
Balsam woolly adelgid *Adelges piceae*	Fraser fir	North Carolina, Tennessee, Virginia	Populations were high again this year. Mortality continues throughout the range of Fraser fir in the Southern Appalachian Mountains.
Black-headed pine sawfly *Neodiprion excitans*	Southern pines	Florida	Over 400 acres of a 7-year-old loblolly pine plantatation was severely defoliated causing extensive mortality in Levy County.
Black turpentine beetle *Dendroctonus terebrans*	Southern pines	Regionwide	Damage was moderate throughout the Region. Some isolated reports of mortality occurred in the eastern portions of North Carolina and in southwest Tennessee. Fire-damaged, older stands sustained higher beetle infestations in Florida.
Black twig borer *Xylosandrus compactus*	Hardwoods	Florida, Georgia, North Carolina, South Carolina, Tennessee	Incidence of this introduced ambrosia beetle increased, except in Florida. It was sometimes found in association with fusarium canker, especially in shade trees. Georgia reported high activity on newly transplanted dogwood, magnolia and holly. Tennessee reported increasing damage in central and eastern parts of the state.
Buck moth *Hemileucia maia*	Oaks	Louisiana, Virginia	Moderate to severe defoliation on 15,000 acres in the City of New Orleans. Scattered throughout Virginia, causing light damage.

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

Insect	Host	Location	Remarks
Coneworms *Dioryctria amatella* *Dioryctria clarioralis* *Dioryctria disclusa* *Dioryctria merkeli*	Southern pines	Regionwide	Late-season attacks caused extensive damage to several seed orchards across the South. One orchard in Florida reported losses of nearly 30 percent of the cone crop. Early season damage by *D. disclusa* was minimal across the south, with most orchards reporting losses of less than 5 percent.
Eastern tent caterpillar *Malacosoma americanum*	Hardwoods, especially Black cherry	Regionwide	Isolated heavy defoliation in central Tennessee. Arkansas, North Carolina and Virginia reported damage virtually everywhere that roadside cherry occurs.
Fall cankerworm *Alsophila pometaria*	Hardwoods	North Carolina, Virginia	Over 85,000 acres of heavy defoliation occurred in localized areas of southwest Virginia in Giles, Bland and Fauquier Counties. Defoliation also reported in North Carolina.
Fall webworm *Hyphantria cunea*	Hardwoods	Regionwide	Two generations of the webworm were reported in South Carolina, North Carolina and Tennessee. Activity was widespread throughout each state, with light to moderate defoliation. Increasing populations were also reported in Oklahoma, with populations remaining low in Arkansas.
Forest tent caterpillar *Malacosoma disstria*	Hardwoods	Regionwide	Widespread light defoliation was reported in eastern North Carolina, Virginia and South Carolina. Over 300,000 acres of mixed tupelo was defoliated in Louisiana in the spring. Elsewhere, populations remained stable.
Fruittree leafroller *Archips argyrospila*	Bald cypress	Louisiana	Defoliation of 135,000 acres resulted in growth loss and dieback. Damage was limited to the Atchafalaya Basin Area.

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

Insect	Host	Location	Remarks
Gypsy moth *Lymantria dispar*	Hardwoods	Arkansas, Georgia, North Carolina, Tennessee, Virginia	Defoliation occurred on 748,000 acres of host type, mainly within northern Virginia. Defoliation on Federal lands included 274,900 acres on the George Washington National Forest, 20 acres on the Jefferson National Forest, 95,600 acres on the Shenandoah National Park and 800 acres on the Blue Ridge Parkway. Isolated infestations were treated in North Carolina, Tennessee and Georgia. Male moths were trapped in all states Regionwide. A small infestation was located in Arkansas in concert with an extensive trapping program.
Hemlock woolly adelgid *Adelges tsugae*	Hemlock	Virginia	Most of the hemlock type is infested on the Shenandoah National Park, northern sections of the Blue Ridge Parkway and some private lands in mountain counties. Some dieback and mortality occurred.
Hickory bark beetle *Scolytus quadrispinosus*	Hickory	Regionwide	Considerable mortality reported in Orange County, North Carolina. South Carolina reported mortality in root-damaged trees in urban areas.
Introduced pine sawfly *Diprion similis*	White pine	North Carolina	No significant activity was reported in 1992.
Larch sawfly *Pristiphora erichsonii*	Larch	North Carolina	No significant activity was reported in 1992.
Larger elm leaf beetle *Monocesta coryli*	Elm	Mississippi	Scattered defoliation in southwest counties.
Loblolly pine sawfly *Neodiprion taedae linearis*	Southern pines	Regionwide	Populations increased in southwestern Tennessee with many areas of heavy defoliation.
Locust leafminer *Odontota dorsalis*	Black locust	North Carolina, Tennessee, Virginia	Once again, North Carolina reported heavy damage in the western part of the state with scattered damage in the upper Piedmont and foothills area. Moderate damage occurred across Tennessee. Widespread and unusually severe defoliation occurred in Virginia.

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

Insect	Host	Location	Remarks
Nantucket pine tip moth *Rhyacionia frustrana*	Southern pines	Regionwide	North Carolina reported moderate to heavy damage in pine plantations in Orange and Granville counties. Virginia reported significant damage in the Coastal Plain and Piedmont causing growth loss and deformity. South Carolina reported 50-100 percent of the trees were attacked in Conservation Reserve Program plantings. Drought conditions continued to exacerbate infestations in Florida. In Alabama, Oklahoma and Texas populations were moderate.
Oak clearwing borer *Paranthrene simulans*	Oaks	South Carolina	Frequently observed on stressed trees.
Oak skeletonizer *Bucculatrix ainsliella*	Oaks	Georgia	Activity was again observed over a large area in northern Georgia.
Orangestriped oakworm *Anisota senatoria*	Oaks	Regionwide	Unusually high levels of activity were reported again in the southern Apppalachian Mountains, but no significant damage occurred.
Pales weevil *Hylobius pales*	Southern pines	Regionwide	Scattered moderate to heavy loblolly pine seedling mortality. South Carolina reported over 600 acres lost in several tracts with activity and also in Virginia pine Christmas tree plantations. Florida also reported Christmas tree debarking adjacent to cuttings. Damage was noticeably worse in Texas.
Periodical cicada *Magicicada septendecim*	Hardwoods	South Carolina	Damage reported in several counties.
Phoberia moth *Phoberia atomaris*	Oaks	North Carolina	This insect defoliated oak in the central Piedmont.
Pine engraver beetles *Ips avulsus* *Ips calligraphus* *Ips grandicollis*	Southern pines	Regionwide	Georgia and North Carolina reported activity in the Piedmont. In South Carolina activity picked up statewide in late summer and fall. Tennessee reported activity in the southwest and north-central areas. In the Gulf Coastal Plain, populations ranged from average to high, with Louisiana, Texas and Mississippi reporting the most spots.

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

Insect	Host	Location	Remarks
Pine spittlebug *Aphrophora parallela*	Southern pines	North Carolina, South Carolina, Tennessee, Virginia	A moderate amount of activity was observed throughout these states with no significant impact.
Pine webworm *Tetralopha robustella*	Shortleaf pine	Regionwide	No significant activity was reported in 1992.
Psyllidae *Tetragonocephela flava*	Hackberry	Louisiana	Though psyllid populations remained low, dieback and mortality continue.
Redheaded pine sawfly *Neodiprion lecontei*	Southern pines	Florida, Georgia, South Carolina, Tennessee	These states reported increases in activity.
Scale insects (Homoptera)	Southern pines	Regionwide	South Carolina reported severe activity. In Virginia, Cristmas tree plantations were severly damaged.
Seedbugs *Leptoglossus corculus* *Tetyra bipunctata*	Southern pines	Regionwide	Seedbug populations on slash and loblolly pines caused extensive damage in several states. The Florida Divison of Forestry seed orchard near Munson, and the Union Camp Orchard near Hampton, South Carolina, reported 10-15 percent damage to seed crop.
Slash pine flower thrips *Gnophothrips fuscus*	Southern pines	Regionwide	No significant activity was reported in 1992.
Slug oak sawfly *Caliroa* sp.	White oak	Georgia	This late-season defoliator was active again this year in portions of northern counties.

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

Insect	Host	Location	Remarks
Southern pine beetle *Dendroctonus frontalis*	Southern pines	Regionwide	Activity increased to outbreak status in many counties of Alabama, Georgia, Louisiana, North Carolina, South Carolina and Virginia.
Spring cankerworm *Paleacrita vernata*	Hardwoods	Tennessee	Heavy defoliation was reported in northeastern Tennessee with light defoliation in central and eastern portions of the state.
Texas leafcutting ant *Atta texana*	Southern pines	Louisiana, Texas	No significant activity was reported in 1992.
Variable oakleaf caterpillar *Heterocampa manteo*	Various hardwoods	Oklahoma, Texas	No significant activity was reported in 1992.
Virginia pine sawfly *Neodiprion pratti pratti*	Southern pines	North Carolina, South Carolina, Virginia	No significant activity was reported in 1992.
Walkingstick *Diapheromera femorata*	Hackberry, Pecan	Oklahoma	Insect populations were high, but no serious damage was reported in 1992.
Whitefringed beetle *Graphognathus* spp.	Slash pine, Loblolly pine	Florida, Georgia	Damage continued on pine seedlings in Conservation Reserve Program and other plantations.

Number of Infestations

State	1991	1992
Alabama	4,605	6,404
Arkansas	20	625
Florida	0	0
Georgia	4,303	5,640
Kentucky	0	0
Louisiana	4,509	8,923
Mississippi	5,628	4,352
North Carolina	475	1,828
Oklahoma	0	7
South Carolina	1,697	1,518
Tennessee	4	428
Texas	2,755	5,500
Virginia	170	3,121
Total	24,166	38,346

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

Insect	Host	Location	Remarks
White pine cone beetle *Conopthorus coniperda*	Eastern white pine	North Carolina, Tennessee	Beetle populations declined on the USDA Forest Service Beech Creek seed orchard. Populations increased on the North Carolina Forest Service orchard near Morganton, damaging 50 percent of the crop. In Tennessee, populations increased at some seed orchards.
White pine weevil *Pissodes strobi*	White pine	North Carolina, Tennessee, Virginia	Scattered light activity was reported from each state.
Yellow-poplar weevil *Odontopus calceatus*	Yellow-poplar	Tennessee	Activity reported in eastern and central parts of Tennessee with scattered areas of significant activity.

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

Southern Region Diseases

Prepared by Elizabeth A. Brantley and Dale A. Starkey

Disease	Host	Location	Remarks
Stem and Branch Diseases			
Butternut canker *Sirococcus clavigignenti-juglandacearum*	Butternut	Throughout range of butternut	This disease has eliminated most of the butternut in the Southern Region.
Canker rot *Inonotus hispidus*	Oak	Regionwide	Canker rot is a main stem problem. It was scattered throughout much of the oak region.
Cankers *Botryosphaeria ribis*	Hardwoods	Regionwide	This disease was reported throughout the Region, causing severe damage in localized areas.
Chestnut blight *Cryphonectria parasitica* (=*Endothia parasitica*)	Exotic chestnuts, Native chestnuts, Scarlet oak	Throughout host ranges	Large chestnuts have been eliminated. Chestnut sprouts continue to be damaged. Butt swell and rot occur on scarlet oak in some areas.
Comandra blister rust *Cronartium comandrae*	Shortleaf pine	Arkansas, Tennessee	No significant activity was reported in 1992.
Fusiform rust *Cronartium quercuum* f. sp. *fusiforme*	Loblolly pine, Slash pine	Regionwide, except Kentucky, Puerto Rico, U.S. Virgin Islands	This continued to be the most serious disease of southern pines. An estimated 17 million acres were affected at a 10 percent or greater incidence level. Annual losses in the South were estimated at over $ 47 million.
Hypoxylon canker *Hypoxylon atropunctatum*	Hickory, Oak	Regionwide	Common on dead and dying trees weakened by drought or other agents in forest and urban environments. Regional and local droughts in the 1980s reportedly increased disease incidence in the 1990s.
Kabatina twig blight *Kabatina* sp.	Eastern redcedar	Tennessee	Increased infection was reported in central and western Tennessee on new growth.
Leyland cypress canker *Seiridium cardinale*	Leyland cypress	South Carolina	South Carolina reported 10 percent damage was common in Christmas tree plantations.

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

Disease	Host	Location	Remarks
Pitch canker *Fusarium subglutinans* (=*Fusarium moniliforme* var. *subglutinans*	Southern pines, especially Loblolly pine, Slash pine, Virginia pine	Regionwide	Pitch canker was widespread. Eastern Tennessee reported increased incidence in shortleaf and loblolly plantations. South Carolina reported several Conservation Reserve Program and Christmas tree plantations were infected. Georgia reported increased activity on shortleaf in the northeastern section of the state.
Red heart disease *Phellinus pini*	Southern pines	Regionwide	Red heart disease was more common in older stands. It is an important heart rot in nesting habitat for the red-cockaded woodpecker.
Slime flux *Erwinia* spp. *Clostridium* spp. and other bacteria	Maple, Other hardwoods	Regionwide	Infections were reported in urban areas and storm-damaged forest stands.
Stem canker *Fusarium* spp.	Mahoe	Puerto Rico	No significant activity was reported in 1992.
Stem decay Basidiomycetes	All species, especially Hardwoods	Regionwide	Stem decay continued to be a problem and was common in stands damaged by fire, storms and logging.
Twig canker **Atropellis canker** *Atropellis* spp.	Native and exotic hard pines	Virginia	This disease was scattered statewide.
Twig canker **Valsa canker** *Valsa* spp.	Eastern white pine	Tennessee	Increased incidence was reported in urban locations in central Tennessee.
White pine blister rust *Cronartium ribicola*	Eastern white pine	North Carolina, Virginia	Found above 3,000 feet elevation, this disease was serious only in localized areas.

Root Diseases

Annosus root disease *Heterobasidion annosum*	Eastern white pine, Southern pines	Regionwide	Annosus root disease continued to be the most serious root disease in the South. Bark beetle infestations frequently occurred in infected stands. The disease resulted in hazardous trees in recreation areas.

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

Disease	Host	Location	Remarks
Littleleaf disease *Phytophthora cinnamomi* and *Pythium* spp.	Loblolly pine, Shortleaf pine	Alabama, Georgia, Kentuky, North Carolina, South Carolina, Tennessee, Virginia	This disease was common in the Piedmont in natural and planted stands over 45 years of age. Incidence was reduced somewhat because of the widespread planting of less susceptible loblolly pine.
Procerum root disease *Leptographium procera*	Eastern white pine, Southern pines	Throughout host range	This disease was common across the Region. Tennessee reported an increase in eastern and central locations. *L. procera* was prevalent in sampled roots of bark beetle-attacked trees in the Gulf Coastal Plain.
Root decay *Armillaria* spp. *Inonotus circinatus* *Phaeolus schweinitzii* *Ganoderma lucidum*	Most conifers, Hardwoods	Regionwide	Root decay was common in forest stands and urban environments, especially where stresses were severe, trees overmature or root systems were damaged. It was more common in areas with severe drought.
Sand pine root disease *Phytophthora cinnamomi* *Inonotus circinatus* var. *circinatus* *Armillaria tabescens* *Leptographium procera*	Sand pine	Florida	The disease was common across the range of sand pine. Damage was most severe on Ocala sand pine.

Foliage Diseases

Anthracnose *Gnomonia* sp. *Kabatiella* sp. (= *Gloeosporium* sp.) *Apiognomonia* sp. (=*Gnomonia* sp.)	Hardwoods, especially Ash, Maple, Sycamore, Walnut	Regionwide	Incidence was higher in most areas due to a wet spring. Maples defoliated early due to the leaf disease.
Black gum mortality Unknown	Black gum	Georgia, North Carolina, Tennessee	This disease, which causes foliage infections, twig cankers and tree death, was commonly found associated with dogwood anthracnose.
Brown spot *Mycosphaerella dearnessii* (=*Scirrhia acicola*)	Longleaf pine	Throughout host range	This disease was reported in regeneration areas. The incidence remained constant relative to prior years.

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

Disease	Host	Location	Remarks
Dogwood anthracnose *Discula* sp.	Flowering dogwood	Alabama, Georgia, Kentucky, North Carolina, South Carolina, Tennessee, Virginia	This disease has now been found in 163 counties in the mountains and Piedmont, an increase from 144 counties in 1991. The disease caused premature defoliation and tree death in much of the affected area, especially at higher elevations. In some areas above 3,000 feet, 100 percent mortality has occurred.
Needle casts of pine *Hypoderma* spp. *Lophodermium* spp. *Ploioderma* spp. *Rhizosphaera* spp.	Pines	Regionwide	Needle cast symptoms were common throughout the South, particularly in the spring. Heavy annual impact on Virginia and sand pine Christmas trees in Alabama, Florida, Mississippi and South Carolina. A few counties in western Tennessee and the Cumberland plateau reported increases.
Oak leaf blister *Taphrina caerulescens*	Red oaks	Regionwide	The disease occurs annually across the Region.
Pine needle rust *Coleosporium* spp.	Pines	Regionwide	Reported in scattered localities.
Powdery mildew *Uncinula macrospora* *Microsphaera* sp.	Hardwoods	Regionwide	Tennessee reported an increase in incidence on oak and elm.
Vascular Wilts and Declines			
Dutch elm disease *Ceratocystis ulmi*	Elms	Throughout host range	Increased mortality was reported in southwest and northeast Tennessee. The known range was extended in Louisiana by five parishes to a total of 18 parishes.
Mimosa wilt *Fusarium oxysporum* f. sp. *perniciosum*	Mimosa	Throughout host range	No significant activity was reported in 1992.
Oak decline/mortality complex	Oaks, especially Red oak group	Regionwide	Decline and mortality were widely reported in the 1980s. Mortality was more frequent on or near ridges with shallow, rocky soils. Inventories in North Carolina during 1990-1991 showed 973,000 acres affected. The mountains had the highest incidence in oak forest types (20 percent). Over 3.9 million acres are estimated to be affected, about 10 percent of vulnerable acres.

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

Disease	Host	Location	Remarks
Oak wilt *Ceratocystis fagacearum*	Oaks	Arkansas, Kentucky, North Carolina, South Carolina, Tennessee, Texas, Virginia	Oak wilt continued to cause tree mortality in some localities. In 1992, new detections increased the number of counties with infection centers in North Carolina. Severe losses reported in red and live oak in central Texas. The disease has been confirmed in 46 Texas counties. Status was unchanged in Virginia although surveys were difficult due to gypsy moth defoliation.
Spruce-fir decline and mortality	Fraser fir, Red spruce	North Carolina, Tennessee, Virginia	This decline results in thinning crowns and dieback of the respective tree species. Mortality has been reported.
Verticillium wilt *Verticillium albo-atrum*	Silver maple, Sugar maple	Tennessee	Increases were reported in scattered locations of northeast Tennessee.
Nursery Diseases			
Anthracnose *Colletotrichum* sp.	Russian olive	Texas	No significant activity was reported in 1992.
Damping-off *Fusarium* spp. *Cylindrocladium* spp. *Phytophthora* spp. *Pythium* spp. *Rhizoctonia* spp.	Many Conifers and Hardwoods	Regionwide	Chronic losses were typified by reduced and irregular density in the seedbeds. Damage was more severe in 1992 due to the wet spring.
Diplodia blight *Sphaeropsis sapinea*	Scotch pine	Oklahoma	No significant activity was reported in 1992.
Fusiform rust *Cronartium quercuum* f. sp. *fusiforme*	Loblolly pine, Longleaf pine, Slash pine	Regionwide	Less than one percent of the trees in nurseries were affected due to the use of fungicides.
Phomopsis blight *Phomopsis juniperovora*	Red cedar	Oklahoma	A 30-percent reduction in red cedar was reported in a state nursery in Oklahoma.
Pitch canker *Fusarium subglutinans*	Shortleaf pine, Virginia pine	North Carolina, Tennessee	Contaminated seed from damaged orchards resulted in nursery and outplanting mortality.
Rhizoctonia needle blight *Rhizoctonia* spp.	Longleaf pine	Alabama, Louisiana, Mississippi	No significant activity was reported in 1992.

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

Disease	Host	Location	Remarks
Root rot *Fusarium* spp., *Macrophomina phaseolina* *Phytophthora* spp. *Pythium* spp.	Black walnut, Eastern white pine, Loblolly pine, Slash pine, Virginia pine	Regionwide	Root rots continued as chronic problems in environments where seedlings were under stress from excessive or inadequate moisture or soil conditions.
Tip blight *Phoma* sp.	Loblolly pine, Longleaf pine	Regionwide	Approximately 10,000 loblolly pines were affected at a Texas industrial nursery.

Seed Orchard Diseases

Canker diseases *Lasiodiplodia* sp. Unidentified fungi	Northern red oak	Tennessee	Branch dieback and some mortality continued in 1992.
Cone damage *Lasiodiplodia* spp.	Eastern white pine	North Carolina	No significant activity was reported in 1992.
Pitch canker *Fusarium subglutinans*	Southern pines, especially Loblolly pine, Slash pine	Regionwide	Pitch canker continued as a serious problem in some orchards causing dieback, cone loss and seed infection. Increased incidence was reported in a shortleaf seed orchard in east Tennessee.
Root diseases *Armillaria* spp. *Armillaria tabescens* (=*Clitocybe tabescens*) *Heterobasidion annosum* *Inonotus circinatus* *Leptographium procera*	Eastern white pine, Shortleaf pine	North Carolina, South Carolina	No significant activity was reported in 1992.
Seed fungi *Lasiodiplodia* sp. Unidentified fungi	Northern red oak	Tennessee	Several fungi were associated with diseased acorns in one of the first crops from a 20-year-old seedling seed orchard. Insect damage was coincident on some diseased acorns.

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

Disease	Host	Location	Remarks
Abiotic Damage			
Animal damage	All species	Regionwide	Increased beaver activity near water courses in southwest Tennessee resulted in damage. Deer caused terminal shoot damage to 2,100 loblolly pine seedlings in central Tennessee.
Atmospheric deposition symptoms	Bioindicators such as Ash, Blackberry, Sweetgum, Yellow poplar	Georgia, North Carolina, South Carolina, Virginia	No significant activity was reported in 1992.
Coastal forest decline	Oak, Pines, Palms, Red cedar	Florida	There is an apparent ecological change that is taking place along the Florida Gulf Coast near Waccasassa Bay. Thousands of cabbage palm, and to a lesser degree other species (oak, pine, red cedar), were reported dead or dying. The cause for this change is unknown, but salt water intrusion has been proposed as a theory.
Drought	All species	Regionwide	Drought was scattered, but common throughout the region.
Frost damage	All species	North Carolina, Tennessee	Increased damage was reported in Tennessee.
Ozone injury	Eastern white pine, various bioindicator species	Regionwide	Tipburn was observed in some eastern white pine families. Indicator plants were used to assess ozone levels in wilderness areas. Symptoms were found througout the South. White pine symptoms in Tennessee were lower than in 1991.
Wind injury	All species	Georgia, Louisiana, Mississippi, Tennessee	Tornadoes caused swathes of damage several miles in length in Tennessee, Mississippi and Georgia. Hurricane Andrew caused significant blow down in southern Lousisiana, Mississippi and Florida.

Eastern Region / Northeastern Area Insects

Prepared by W. Burkman, M. Mielke, M. Miller-Weeks, F. Peterson, & D. Twardus

Insect	Host	Location	Remarks
Aphids *Periphyllus spp.*	Sugar maple	Vermont	No significant activity was reported in 1992.
Arborvitae leaf miner *Argyresthia thuiella*	Northern white cedar	Maine, Vermont	The state of Maine reported light to moderate defoliation of 200,000 acres of spruce-fir forest throughout the state. Light to moderate damage also occurred on 20,000 acres of urban forest. Some light damage was reported in Caledonia and Rutland counties of Vermont.
Ash plant bug *Tropidosteptes amoenus*	Green ash	Iowa	There were 200 acres defoliated in Iowa.
Aspen webworm *Tetralopha aplastella*	Aspen	Minnesota	No significant activity was reported in 1992.
Bagworm *Thyridopteryx ephemeraeformis*	Eastern white pine	Illinois	Illinois reported 25 urban trees defoliated.
Balsam gall midge *Paradiplosis tumifex*	Balsam fir	Maine, New York, Vermont	Populations are low and stable on 1,000 acres of fir plantations throughout Maine. Damage was reported in only very localized areas. Damage decreased in the state of Vermont, occurring on only about 20 acres. No significant activity was reported in New York.
Balsam twig aphid *Mindarus abietinus*	Balsam fir	Maine, Vermont	In Maine, damage was heavy on 1,000 acres of balsam fir plantations and caused a serious impact on the wreath industry. Scattered pockets of moderate to heavy damage occurred on 5,000,000 acres of spruce-fir forest. Populations are expected to collapse. The severity of this pest was moderate throughout Vermont and decreased somewhat in the northern part of the state. Further decrease is expected in 1993.

Eastern Region and Northeastern Area--Status of insects in Connecticut, Delaware, 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
Balsam woolly adelgid *Adelges piceae*	Balsam fir	Maine, Vermont, West Virginia	No significant activity was reported in Maine or Vermont. Trees in a commercial seed orchard were affected in West Virginia.
Basswood thrips *Thrips calcaratus*	Basswood		No significant activity was reported in 1992.
Birch casebearer *Coleophora serratella*	Paper birch	Maine	Population levels generally remained similar to 1991 in Maine. Light to moderate damage was spotty or local throughout the northern hardwood and aspen-birch forests.
Birch leafminers *Fenusa pusilla* and *Messa nana*	Gray birch, Paper birch, Yellow birch	Maine, Rhode Island, Vermont	Populations varied in individual stands in central and eastern Maine but overall levels remained similar to 1990 and 1991. Severity was light to moderate on 150,000 acres and moderate to heavy on 50,000 acres of northern hardwood and aspen-birch forest. In Rhode Island, populations were moderate to heavy statewide. Vermont reports total acres affected decreased to 16,000 in 1992.
Birch skeletonizer *Bucculatrix canadensisella*	Gray birch, Paper birch, Yellow birch	Maine, New York, Vermont	Defoliation varied from light to heavy on 300,000 acres of birch in Maine. This was a noticeable increase from already high 1991 levels. No significant activity was reported in New York in 1991. In Vermont, the total acreage of birch forest affected decreased.
Black locust borer *Megacyllene robiniae*	Black locust	Illinois	There were 194 acres affected in Illinois.
Black turpentine beetle *Dendroctonus terebrans*	Black pine, Pitch pine, Red pine	Indiana, New York, Rhode Island	First report of damage in a Hoosier National Forest plantation in Indiana. No significant activity was reported in New York. Activity was light in southwestern Rhode Island and light to heavy on approximately 50 acres of Block Island.
Bronze birch borer *Agrilus anxius*	Paper birch	Michigan, Minnesota, Wisconsin	No significant activity was reported in 1992.

Eastern Region and Northeastern Area--Status of insects in Connecticut, Delaware, 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
Bronze poplar borer *Agrilus liragus*	Aspen, Balsam poplar	Michigan, Minnesota	There was 10-20 percent mortality on poorly drained lowlands in the eastern Upper Peninsula of Michigan. No activity was reported in Minnesota.
Browntail moth *Euproctis chrysorrhoea*	Amelanchier, Cherry, Hawthorn, Oak, Rose, Rubus, Willow	Maine, Massachusetts	The area of intensity continued to expand in southeastern Maine. Light to severe defoliation occurred on more than 2,000 acres of coastal islands and mainland. Further increase is expected in 1993. (Note: The 1991 Forest Insect and Disease Conditions in the United States incorrectly stated damage on Long Island, New York. Severe defoliation was reported on Long Island, Maine.) No significant activity was reported in Massachusetts in 1992.
Bruce spanworm *Operophtera bruceata*	Sugar maple	Maine, Vermont	High moth populations were observed in some northern hardwood stands in Maine but no defoliation was detected. Conditions in Vermont were similar to 1991. Moths were frequently observed but only light defoliation occurred in scattered locations in the northern part of the state.
Buck moth *Hemileuca maia*	Oak	Delaware	No damage was observed in 1992.
Cherry scallop shell moth *Hydria prunivorata*	Black cherry	Massachusetts, New York, Pennsylvania, Vermont	No significant activity was reported in the states of Massachusetts and New York. Pennsylvania reported 38,701 acres of defoliation in Potter, McKean and Cameron Counties. In Vermont, there was heavy defoliation on 140 acres in Caledonia County. Levels were similar to 1991.
Common European pine shoot beetle *Tomicus pinipetrda*	Austrian pine, Eastern white pine, Jack pine, Red pine, Scotch pine	Illinois, Indiana, Michigan, New York, Ohio, Pennsylvania	Originally detected near Cleveland, Ohio, the pine shoot beetle has been found in 6 states and 41 counties: Illinois-1, Indiana-18, Michigan-3, Ohio-14, New York-2 and Pennsylvania-3. Primarily found in Christmas tree plantations and on Scotch pine.

Insect	Host	Location	Remarks
Conifer swift moth *Korscheltellus gracilis*	Balsam fir, Red spruce	New Hampshire, New York, Vermont	No significant activity was reported in New Hampshire or New York. There was some activity in high-elevation spruce-fir stands in Vermont but no new sites were observed.
Eastern larch beetle *Dendroctonus simplex*	Larch	Maine, Vermont	In Maine, field observations showed mortality was stable and estimated to be less than five percent. Aerial observations in Vermont showed scattered damage on 165 acres of spruce-fir forest. Population trend stabilized.
Eastern tent caterpillar *Malacosoma americanum*	Apple, Cherry, Crabapple, Gray birch, Wild Plum	Connecticut, Massachusetts, Michigan, Missouri, Rhode Island, Vermont	No activity was reported from Connecticut. Damage was heavy on 1,000 acres in northeastern Massachusetts. Levels are expected to remain high for next year or two. Michigan reported a population collapse in the Upper Peninsula. No activity was reported in the Lower Peninsula. In Missouri, 1,272,950 acres of defoliation were reported. There was light damage in Providence County, Rhode Island. Populations in Vermont were light and mostly on ornamentals and along roadsides.
Elm leaf beetle *Pyrrhalta luteola*	Elm, Siberian elm	Iowa, Missouri, Vermont	There were 5,000 acres of Siberian elms defoliated in Iowa. In Missouri, populations occurred statewide in urban areas. No significant activity was reported in Vermont.
Elm spanworm *Ennomos subsignarius*	Ash, Maple	Pennsylvania	There were 271,703 acres of defoliation in the northern hardwood forest type of several northwest counties, including parts of the Allegheny National Forest. On the Allegheny National Forest, approximately 20,000 acres were affected by both the elm spanworm and frost.
Elongated hemlock scale *Fiorinia externa*	Eastern hemlock	Connecticut, New York	No significant activity was reported in 1992.
European pine sawfly *Neodiprion sertifer*	Scotch pine	Illinois, Indiana, Iowa	Over 100 acres of plantations were defoliated in Illinois and Iowa. Insects were observed but there was no damage in Indiana.

Insect	Host	Location	Results
Fall cankerworm *Alsophila pometaria*	Maple, Oak	Maryland, Massachusetts, Pennsylvania	Defoliation occurred in central and western counties of Maryland. No significant activity was reported from Massachusetts. In Pennsylvania, there was scattered light to heavy defoliation in Berks, Washington and Monroe Counties. Also see looper complex.
Fall webworm *Hyphantria cunea*	Apple, Black cherry, Boxelder, Hickory, Persimmon, Pin cherry, Redbud, Sycamore, Black walnut	Massachusetts, Maine, Missouri, New Hampshire, New York, Vermont	Heavy defoliation continued in Massachusetts. The infestation was severe on 1,000 acres of northern hardwood forest in Middlesex and Worcester Counties. Maine reported 115,000 acres of elm-ash-cottonwood forest type moderately affected. In Missouri, 5,432,000 acres were affected statewide. The webworm was reported active in the aspen-birch forest type in New Hampshire. No significant activity was reported in New York. Damage remained heavy along roadsides in southeastern Vermont, but was generally less than in 1991.
Fiorinia scale *Fiorinia fioriniae*	Hemlock	New Jersey	A building population caused branch dieback and some tree mortality on the Picatinny Arsenal in New Jersey.
Forest tent caterpillar *Malacosoma disstria*	Aspen, Oak, Poplar, Sugar maple, Other hardwoods	Indiana, Maine, Michigan, Minnesota, New York, Pennsylvania, Vermont, Wisconsin	No defoliation was reported in Indiana and Maine. Defoliation of only 7,300 acres occurred in Michigan. In Minnesota, defoliation was light on about 50,000 acres and moderate on 2,500 acres. This marked the collapse of a 3-year outbreak. The infestation increased throughout its range in New York State and was moderate to severe on 89,125 acres. In Pennsylvania, there were 322 acres of defoliation in Potter County. Populations remain low in Vermont. There was no defoliation reported and only scattered sightings of larvae. In Wisconsin, there was 208,000 acres of moderate defoliation.
Ghost moth *Sthenopis* spp.	Aspen	Minnesota	Minnesota reported 100 acres affected.

Insect	Host	Location	Remarks
Gypsy moth *Lymantria dispar*	Hardwoods	Connecticut, Delaware, Illinois, Indiana, Iowa, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, West Virginia, Wisconsin	Defoliation levels decreased in Connecticut and Delaware. No significant activity was reported from Illinois and Iowa. There were six new counties in Indiana with male moths trapped. Levels of defoliation decreased in Maine; damage that was present occurred in the far southern part of the state; populations peaked in 1991 and were expected to continue downward. Populations decreased in Maryland and New Jersey due to fungal infections. Populations declined by half in Massachusetts with light to heavy damage remaining on almost 124,000 acres. There were about 712,000 acres of defoliation in the Lower Peninsula of Michigan. Populations were expected to continue to increase and spread statewide throughout the oak and aspen forest types. Defoliation was reported for the first time in the Upper Peninsula with 10 acres affected. Moths trapped in Minnesota increased but no other life stages were observed. Statewide trapping continued in Missouri and low numbers of male moths were present. In New Hampshire, defoliation was about the same in 1992 as 1991. Over 180,000 acres were affected with moderate to heavy defoliation. About 60,000 acres were defoliated in New York, a decrease from 1991. Populations in northeastern Ohio continued to expand. In Pennsylvania, populations decreased; a slight increase occurred on the Allegheny National Forest where 13,700 acres were defoliated. No visible damage in Rhode Island could be attributed to gypsy moth. Populations collapsed in Vermont and there was moderate damage on only 160 acres. There was a decrease in activity in West Virginia. There was no detectable defoliation in Wisconsin although almost 1,000 moths were trapped statewide; other life stages were found in Marinette, Oconto, Door and Sheboygan Counties.

Insect	Host	Location	Remarks
Hemlock loopers *Lambdina* spp.	Various softwoods	Connecticut, Maine, Massachusetts, New Hampshire, Vermont	*L. fiscellaria* was not a major problem in Connecticut in 1992, although moths were caught in pheromone traps throughout most of the state. The area of defoliation in Maine decreased in 1992. Damage was heavy on 80,000 acres and detectable on 140,000 acres. In Massachusetts, there was 15,000 acres of light to heavy defoliation in Franklin and Worcester Counties. Populations appeared to have collapsed in some areas. Hemlock looper damage was observed in southwestern New Hampshire. There was no aerial damage mapped in Vermont from *L. fiscellaria* but pheromone trap catches averaged 282 moths per trap. Eggs, extracted larvae and light defoliation were observed in scattered locations. Vermont reported only light damage in Windam County from *L. athasaria*. Area of infestation declined from 1991.
Hemlock woolly adelgid *Adelges tsugae*	Eastern hemlock	Connecticut, Maryland, Massachusetts, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, West Virginia	Infestation was present in every county of Connecticut. The insect continued to be present in Maryland. Several new infestations were found in Massachusetts and in some locations damage was heavy. In New Jersey, an estimated 24,547 acres were infected. The insect continued to infest the counties of southeastern New York and has spread within those counties. The Delaware Water Gap National Recreation Area in Pennsylvania and New Jersey reported scattered severe infestations. Damage was reported as light in Providence and Washington Counties in Rhode Island. Infestations spread to new locations along the coastline. In Vermont, no adelgids were found during any eradication surveys done in the area where the insects were introduced in 1990. Hampshire, Hardy, Grant and Pendleton Counties in West Virginia reported infestations.

Insect	Host	Location	Remarks
Introduced pine sawfly *Diprion similis*	Eastern white pine, Scotch pine	Minnesota, Vermont, Wisconsin	No significant activity was reported in Minnesota and Wisconsin. The insect was widely scattered statewide on plantations in Vermont.
Jack pine budworm *Choristoneura pinus pinus*	Jack pine, Red pine	Michigan, Minnesota, Wisconsin	In Michigan, about 20,000 acres were defoliated in the Upper Peninsula. About 4,000 acres were defoliated in the Lower Peninsula. Over 125,000 acres of heavy defoliation occurred in northern Wisconsin.
Jack pine sawfly *Neodiprion pratti banksianae*	Jack pine	Maine, Minnesota	Infestation levels in Maine decreased in 1992 but moderate to severe damage remains on 500 acres. No significant activity was reported in Minnesota.
Larch sawfly *Pristiphora erichsonii*	Eastern larch	Massachusetts, Maine	Moderate damage was reported on 25 acres in Worcester County, Massachusetts. Generally light infestation occurred on about 1,000 acres in Maine. Levels are higher than 1991 and are expected to continue to increase in 1993.
Leaf roller/tier complex Including: **Aspen leafroller** *Pseudexentera oregonana* **Darkheaded aspen leafroller** *Anacampsis innocuella* **Fruittree roller** *Archips argyrospila* **Green aspen leaftier** *Pandemis canadana* **Large aspen tortrix** *Choristoneura conflictana* **Obliquebanded leafroller** *Choristoneura rosaceana*	Aspen	Minnesota	Almost 400,000 acres defoliated.
Lecanium scale *Lecanium* sp.	Black locust, Black walnut, Maple, Oak	Illinois, Vermont	There was defoliation on 200 trees on four acres reported in Illinois. No significant activity was reported in Vermont.

Insect	Host	Location	Remarks
Locust leafminer *Odontota dorsalis*	Black locust	Maine, Vermont, West Virginia	Moderate to heavy damage was found in several new areas of urban and farm lands in Maine. Trees were affected statewide in West Virginia. Outbreaks were severe in the northern part of the state. Some light to moderate damage occurred along roadsides in Windham and Chittenden Counties, Vermont.
Looper complex	Maple, Oak	Delaware, Indiana, Maryland, Pennsylvania, West Virginia	There was scattered defoliation primarily in oak-hickory forests in Delaware, Indiana, Maryland and West Virginia caused by the complex of half-wing geometers, linden looper and fall cankerworm. In Pennsylvania, scattered defoliation from this complex was reported on the Allegheny National Forest.
Maple leafcutter *Paraclemensia acerifoliella*	Sugar Maple	New York, Vermont	No significant activity was reported in New York. Aerial survey in Vermont showed 3,700 acres of moderate to heavy damage. This was lower than 1991 levels but populations were probably temporarily depressed due to cool weather in 1992 and may increase again in 1993.
Maple leafroller *Sparganothis acerivorana*	Red maple, Sugar maple	Maine, Vermont	No defoliation was observed statewide in Maine. In Vermont, light damage was reported in the township of Bristol.
Maple trumpet skeletonizer *Epinotia aceriella*	Red maple, Sugar maple	New York, Vermont	No significant activity was reported in New York. Damage was mostly light in Vermont and generally less than in previous years.
Nantucket pine tip moth *Rhyacionia frustrana*	Pines	Illinois, Massachusetts	There were 3 acres of Scotch pine affected in Illinois. No significant activity was reported in Massachusetts.
Oak leaftier *Croesia semipurpurana*	Red oak	Maine, New Hampshire, Vermont	No significant activity was reported in Maine. Populations were not significant in New Hampshire. No moths were caught in pheromone traps in Vermont.
Oak skeletonizer *Bucculatrix ainsliella*	Red oak, Shingle oak	Missouri, Massachusetts	No significant activity was reported in Missouri. There was heavy damage on 10,000 acres of red oak in Worcester and Berkshire Counties in Massachusetts.
Orangestriped oakworm *Anisota senatoria*	Various oaks	Michigan, Rhode Island	No significant activity was reported in Michigan. Light infestation was observed on black oak in wooded areas of northwestern Rhode Island.

Eastern Region and Northeastern Area--Status of insects in Connecticut, Delaware, 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
Oystershell scale *Lepidosaphes ulmi*	American Beech	New York, Vermont	No significant activity was reported in New York. Levels in Vermont are about the same as in 1991 on overstory trees but have increased on suppressed trees.
Pales weevil *Hylobius pales*	Scotch pine	Vermont	Population levels decreased in Vermont with light to moderate damage on only 12 acres of Christmas tree plantations.
Pear thrips *Taeniothrips inconsequens*	Black cherry, Sugar maple	Iowa, Maine, Maryland, Michigan, Minnesota, Pennsylvania, Rhode Island, Vermont, West Virginia, Wisconsin	No significant activity was reported in Iowa, Maryland, Michigan, Minnesota and Wisconsin. There was no damage reported in Maine and populations were at low, stable levels. Insects were trapped on the Allegheny National Forest in Pennsylvania but no damage was observed. Some light to heavy damage was observed on less than 25 acres in Providence and Washington Counties in Rhode Island. The pest is not expected to become a big problem in the near future. Damage continued to be light throughout northern hardwood stands in Vermont and population levels remained low. In West Virginia, no damage was detected but insects were trapped.
Pine bark aphid *Pineus strobi*	Eastern white pine, Scotch pine	Illinois	Three acres affected.
Pine engraver beetle *Ips pini*	Jack pine, Red pine	Michigan	No significant activity reported in 1992.
Pine false webworm *Acantholyda erythrocephala*	Various pines	New York	The infestation in New York continued to increase in area and intensity. The area affected was 150,000 acres in St. Lawrence and Franklin Counties in the northern part of the state. The level of defoliation reported was 60-100 percent.
Pine needleminer *Exoteleia pinifoliella*	Pitch pine, Hard pine	Massachusetts, Maine	Severe defoliation was detected by aerial survey on almost 3,200 acres on Cape Cod in Massachusetts. In Maine, damage was severe on 150 acres in Penobscot County, but still stable overall.
Pine needle scale *Chionaspis pinifoliae*	Eastern white pine, Scotch pine	Illinois, Iowa	Six acres affected in Illinois and 15 acres in Iowa.

Insect	Host	Location	Remarks
Pine root collar weevil *Hylobius radicis*	Scotch pine	Indiana, West Virginia	There was scattered understory trees killed in Jackson County, Indiana. No significant activity was reported in West Virginia.
Pine tussock moth *Dasychira pinicola*	Jack pine	Wisconsin	There were 1,600 acres of heavy defoliation reported in Burnett County, Wisconsin.
Pine webworm *Tetralopha robustella*	Scotch pine	Illinois	Defoliation on a 4-acre plantation.
Pitch pine looper *Lambdina* spp.	Pitch pine	Massachusetts, New Jersey, New York	Infestation in Massachusrtts continued for a second year at about the same level. Defoliation was moderate on 500 acres in Plymouth County in the southeastern portion of the state. In New Jersey, population levels decreased in the Pinelands. There were 386,718 acres affected but defoliation was not as severe as 1991. No significant activity was reported in New York.
Redheaded jackpine sawfly *Neodiprion rugifrons*	Jack pine	Wisconsin	No significant activity was reported in 1992.
Redheaded pine sawfly *Neodiprion lecontei*	Jack pine, Loblolly pine, Red pine, Scotch pine, Shortleaf pine	Illinois, Iowa, Michigan, Missouri	There was scattered defoliation on plantations throughout the area. Michigan reported 460 acres defoliated in the Upper Peninsula.
Red pine adelgid *Pineus borneri*	Red pine	Connecticut, Massachusetts, New York, Rhode Island	No significant activity was reported in Connecticut, Massachusetts, and New York. Damage was light and spotty on fewer than 20 acres in southern Rhode Island.
Red pine scale *Matsucoccus resinosae*	Red pine	Connecticut, New York, Rhode Island	No significant activity was reported in Connecticut. The infestation continued in southeastern New York counties where it appears to have reached its northern limit. Mortality and decline of red pine within these counties is high. The area of damage in Rhode Island expanded and was moderate to heavy on 75 to 100 acres in Washington County.

Eastern Region and Northeastern Area--Status of insects in Connecticut, Delaware, 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
Saddled prominent *Heterocampa guttivitta*	Sugar maple, White oak	Maine, Massachusetts, Rhode Island, Vermont	No larvae or damage were found in Maine. No significant activity was reported in Massachusetts. In Rhode Island, the severity of this insect was reported as moderate to heavy in Washington County. Vermont reported the presence of larvae and moths but no damage detected.
Slug oak sawfly *Caliroa quercuscoccineae*	Oaks	Indiana	No significant activity was reported in 1992.
Southern pine beetle *Dendroctonus frontalis*	Loblolly pine	Maryland	There were 177 acres of mortality on the eastern shore of Maryland.
Spearmarked black moth *Rheumaptera hastata*	Birch	Vermont	No damage was detected in 1992 but moths were unusually abundant in the northern part of the state.
Spring cankerworm *Paleacrita vernata*	Scotch pine	Delaware	No significant activity was reported in 1992.
Spruce beetle *Dendroctonus rufipennis*	Black spruce, Red spruce, White spruce	Maine, New York	The serverity of the infestation in Maine was again heavy on over 9,000 acres in northern and western areas. Scattered infestations continued to occur in spruce-fir stands throughout the state. New attacks nearly ceased except in the east coastal area and on islands where 50 new acres were infested in 1992. Over 8,000 acres in New York continued to be affected with moderate to heavy damage. Levels increased in Hamilton County and remained stable in Fulton County.
Spruce budworm *Choristoneura fumiferana*	Balsam fir, Black spruce, Red spruce, White spruce	Maine, Minnesota, New Hampshire, New York, Vermont	There was no damage from spruce budworm in Maine in 1992. Populations remained very low but scattered larvae were observed and the number of moths caught in pheromone traps increased sharply in 1992. Minnesota reported 126,000 acres defoliated in the northern part of the state. Pheromone traps in New Hampshire showed no significant population present. No damage was reported in New York; number of moths caught in pheromone traps was low and decreased from 1991. Populations in Vermont continued at low levels, with no visible defoliation detected; the number of moths caught in pheromone traps, which showed a sudden increase in 1991, continued at similar levels in 1992.

Insect	Host	Location	Remarks
Twig beetle *Pityophthorus* sp.	Eastern white pine	Rhode Island	Heavy infestation in the northwest corner of the state. About 20,000 acres affected. Outbreak has occurred over the past three years.
Two-lined chestnut borer *Agrilus bilineatus*	Oaks	Iowa, Michigan	Scattered mortality occurred statewide on 424 acres in Iowa. Michigan reported 3,000 acres of mortality. About one-third of the entire northern pin oak resource has been killed.
Unknown defoliator	Black walnut	Missouri	Defoliation on 10,200 acres by an unknown lepidoptera.
Variable oakleaf caterpillar *Lochmaeus manteo*	American beech	Maine	Damage was light in scattered pockets in Somerset and Piscataquis Counties, Maine. Populations decreased from 1991 levels and are close to endemic.
Virginia pine sawfly *Neodiprion pratti*	Eastern White pine, Shortleaf pine	Regionwide	No significant activity was reported in 1992.
Walnut caterpillar *Datana integerrima*	Black walnut	Missouri	No significant activity was reported in 1992.
White grubs *Phyllophaga* sp.	Jack pine, Red pine	Michigan	Mortality scattered over 1,000 acres in the Upper Peninsula.
White pine weevil *Pissodes strobi*	Eastern white pine	Maine, Vermont	The area affected by this insect increased by about 25 percent to 513,000 acres in Maine. The infested area in Vermont decreased to 78 acres statewide. Damage was light.
Willow leaf beetle *Chrysomela* spp.	Willow	Minnesota	No significant activity was reported in 1992.
Yellowheaded spruce sawfly *Pikonema alaskensis*	Norway spruce, White spruce	Maine, Michigan, Minnesota, Vermont	Populations and damage increased in Maine in 1992. Ornamental and plantation pines were severely affected in spotty areas throughout Aroostock and Penobscot Counties. Defoliation was scattered throughout the Upper Peninsula of Michigan. In Minnesota, 15 acres were defoliated. Damage was light and widely scattered in Vermont but heavier than in 1991.
Yellow poplar weevil *Odontopus calceatus*	Sassafras	Indiana	There was light defoliation in Perry, Spencer and Martin Counties in Indiana.
Zimmerman pine moth *Dioryctria zimmermani*	Scotch pine	Illinois	Defoliation on one acre.

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

Eastern Region / Northeastern Area Diseases

Prepared by W. Burkman, M. Mielke, M. Miller-Weeks, F. Peterson, & D. Twardus

Disease	Host	Location	Remarks
Stem and Branch Diseases			
Beech bark disease *Nectria coccinea* var. *faginata* in association with **Beech scale** *Cryptococcus fagisuga*	American beech	New England, New York, Pennsylvania, West Virginia	The presence of the scale and disease can be found in varying degrees throughout the northern hardwood forest type in New England. Massachusetts reported severe infestation on 1,500 acres in Berkshire County in the northwest corner of the state. In Maine, 17,000 acres were affected statewide and infection levels are stable. The area of damage mapped aerially in Vermont increased to 2,000 acres in the northern region. No increase in activity was reported from New York. The range of the inciting scale continued to increase in Pennsylvania. In 10 years the area of West Virginia colonized by the scale insect has increased from 70,000 acres to 625,000 acres.
Butternut canker *Sirrococcus clavigignenta-juglandacearum*	Butternut	Vermont, Wisconsin	Vermont reported detection of the disease wherever butternut occures. In Wisconsin, 40 counties were infested, including 12 new confirmations in 1992. Only 11 percent of 1,648 survey trees were found to be free of canker. Six additional counties had cankers not yet confirmed in culture.
Caliciopsis canker *Caliciopsis pinea*	Eastern white pine	Maine, Vermont	No significant activity was reported in Maine. No new areas were detected in Vermont and there was some improvement in previously infected stands.
Cedar-quince rust *Gymnosporangium clavipes*	Eastern red cedar	Missouri	Missouri reported 18,400 acres affected.
Comandra blister rust *Cronartium comandrae*	Shortleaf pine	Missouri	Only five plantations on the Mark Twain National Forest were infected.

Eastern Region and Northeastern Area--Status of diseases in Connecticut, Delaware, 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
Cytospora canker *Valsa kunzei* (=*Cytospora kunzei*)	Blue spruce, Norway spruce, Red spruce	Vermont, West Virginia	Few new infestations were observed in Vermont where the fungus affects mostly ornamentals. No significant activity was reported in West Virginia.
Diplodia tip blight *Sphaeropsis sapinea*	Austrian pine, Mugo pine, Ponderosa pine, Red pine, Scotch pine	Indiana, Iowa, Maine, Missouri, Pennsylvania, Rhode Island, Vermont, West Virginia, Wisconsin	No significant activity was reported in Indiana. About 1,000 acres of urban trees were affected in Iowa. No significant activity was reported in Maine. There were scattered ornamentals affected in Missouri. No significant activity was reported in Pennsylvania. Some light damage was observed on Christmas tree plantations in northern Rhode Island. Light damage on ornamentals was reported in Vermont. Infected Christmas trees were sprayed in West Virginia and the disease was not expected to spread. No significant activity was reported in Wisconsin.
Dothistroma needle blight *Dothistroma septospora*	Austrian pine	Missouri, West Virginia	Occurred on scattered urban and ornamental trees in Missouri. This is only the second report in West Virginia and the infected area is being planned for spraying.
Eastern dwarf mistletoe *Arceuthobium pusillum*	Black spruce, Red spruce, White spruce	Maine	There was trace to light damage on 3,000 acres of spruce-fir forest in Maine.
European larch canker *Lachnellula willkommii*	Eastern larch	Maine	Light to heavy infection continued on 6,725 acres in coastal Maine. State and Federal quarantine regulations were still in effect. The 1992 area is just slightly larger than 1991 with new infection located in the town of Baring. An addition of two towns to the quarantine area was proposed to maintain an effective buffer zone. No major increases were expected.
Hypoxylon canker *Hypoxylon* spp.	Aspen, Oaks	Maine, Vermont	Infection ranged from trace to moderate on 17,000,000 acres in Maine. Vermont reports the occurrence of the canker statewide at levels the same as 1991.
Phomopsis tip blight *Phomopsis juniperovora*	Cedars	Missouri	Scattered throughout the state.

Disease	Host	Location	Remarks
Scleroderris canker *Ascocalyx abietina* (=*Gremmeniella abietina*)	Jack pine, Red pine, Scotch pine	Maine, Michigan, New York, Vermont	Infection levels in Maine decreased. Only one stand was reported where the severity was moderate. Branch damage occurred on 3,600 acres in the Upper Peninsula of Michigan. The weather in 1992 was cool and wet, very favorable for disease development. In New York, the disease was present on pine plantations in Lewis, Jefferson, Oneida and Herkimer Counties but remained at low, stable levels. Mortality of infected pines was spotty. Infection continued on plantations in northern Vermont and no new locations were found for the sixth consective year.
Sirococcus shoot blight *Sirococcus conigenus*	Red pine	Maine, Vermont	Maine reports the disease increasing in older pine plantations. Trace to moderate infection occurred on over 3,000 acres. A sudden increase was also reported from Vermont. Scattered shoot mortality occurred on 56 acres of red pine.The cool 1992 summer weather was thought to be responsible.
White pine blister rust *Cronartium ribicola*	Eastern white pine	Indiana, Maine, New Hampshire, Vermont, West Virginia	No significant activity was reported from Indiana or West Virginia. Trace to moderate infection levels occurred on 1,031,000 acres in Maine. Scattered infections continued to be present in New Hampshire. Levels of infection in Vermont were almost the same as 1991. There were 62 acres of the disease detected during ground surveys.
Root Diseases			
Annosus root and butt rot *Heterobasidion annosum*	Red pine	Maine	Light damage was reported on 1,000 acres of red pine plantations. Infection may increase as plantations are thinned and trees mature.
Armillaria root rot *Armillaria* spp.	Jack pine, Red pine	Iowa, Michigan, Minnesota, Wisconsin	Michigan reported scattered mortality in young pine stands. No significant activity was reported in Iowa, Minnesota and Wisconsin.
Procera root rot *Leptographium procera*	Eastern white pine	Indiana	Reported on a Christmas tree farm.

Disease	Host	Location	Remarks
Foliage Diseases			
Anthracnose *Gloeosporium* spp. *Discula spp.* *Apiognomonia* spp. *Gnomonia spp.* *Kabatiella apocrypta*	Ash, Maple, Oak	Indiana, Maine, Minnesota, Vermont	Scattered infections of maple anthracnose were widely distributed on sugar maples in central Indiana. Light damage from ash anthracnose was reported on 2,000 acres of urban and ornamental ash trees statewide in Maine. Infection was less than in 1991. Scattered defoliation covered 50,000 acres in Minnesota. In Vermont, there was scattered damage to sugar maple and oak throughout the Champlain Valley.
Brown Spot *Scirrhia acicola*	Scotch pine	Missouri	Scattered urban and ornamental trees were infected in Missouri.
Dogwood anthracnose *Discula destructiva*	Dogwood	Connecticut, Maryland, Massachusetts, New Hampshire, New York, Pennsylvania, West Virginia	The disease continued to occur throughout Connecticut. No activity was reported in Maryland. The disease was moderate in Massachusetts and could be found statewide wherever the host was present. Infections continued in Rockingham County, New Hampshire, where dogwood reaches the most northerly end of its range. The disease was present in southeastern New York. No significant activity was reported in Pennsylvania or West Virginia.
Oak leaf scorch *Xylemella fastidiosum*	Red oaks	Delaware	No significant activity was reported in 1992.
Vascular Wilts and Declines			
Ash yellows (Ash dieback)	Black ash, Blue ash, Brown ash, Green ash, White ash	Indiana, Iowa, Maine, Minnesota, New York, Pennsylvania, Rhode Island, Vermont	The ash yellows situation in Indiana did not change in 1992 and the disease can be found throughout the northern half of the state, but there was an increase in urban trees in Iowa. Maine reported severe infection on 1,000 acres of brown ash statewide. The disease was confirmed in Minnesota and suspected in several counties. No significant activity was reported in New York or Pennsylvania. Ash yellows was detected in Providence County, Rhode Island; infection was heavy in the town of Lincoln and light in Smithfield. Increased mortality of white ash in recent years in Vermont was thought to be due mostly to ash yellows. Infection was reported in West Virginia for the first time and was located in two counties.

Disease	Host	Location	Remarks
Birch dieback	Paper birch	Maine, Vermont	Maine reported the health of nearly 84,000 acres of birch had improved. Scattered mortality and dieback occurred on 200 acres and appeared to be increasing in Vermont.
Dutch elm disease *Ceratocystis ulmi*	American elm	Areawide	The disease continued to infect elm trees throughout the Region. Iowa reported mortality of 500 trees on 1,779 acres. There was trace to moderate infection on 1,000 acres of northern hardwood forest in Maine. Mortality was scattered over 270,000 acres in urban and rural areas of Missouri.
Elm Yellows	Americam elm	West Virginia	Reported in isolated locations although it is rare in the state.
Larch decline	Eastern larch	Maine, Vermont	No significant activity was reported in 1992.
Maple decline	Red maple, Sugar maple	Maine, Michigan, Pennsylvania, Vermont	No significant activity was reported in Maine and Michigan. There was about 6,200 acres of maple and beech decline reported in Pennsylvania. In Vermont, scattered dieback and mortality of red and sugar maple was reported on 23,000 acres.
Oak decline	Oak species	Iowa, Michigan, Minnesota, Missouri, Wisconsin	There were 350,000 acres of scattered mortality to oak species caused by gypsy moth, drought, frost and old age in Michigan. Scattered mortality was reported in Missouri. No significant activity was reported in Iowa, Minnesota, or Wisconsin.
Oak wilt *Ceratocystis fagacearum*	Red oak group	Indiana, Iowa, Michigan, Minnesota, West Virginia, Wisconsin	Detection in Indiana and West Virginia was difficult because of gypsy moth defoliation. In Iowa, infection centers of 1-2 acres were scattered over 10,000 acres. Michigan reported 236 infection centers in the Upper Peninsula and 300 acres of mortality in the Lower Peninsula. There were 3,000 centers in the 10-county metro region of Minnesota. Infection was reported in 50 counties in Wisconsin.

Disease	Host	Location	Remarks
Pine wood nematode *Bursaphelenchus xylophilus*	Austria pine, Scotch pine	Iowa, Maine, Missouri, New York	Plantations, windbreaks, and ornamental plantings totalling about 291 acres were affected in Iowa. No significant activity was reported in Maine, Missouri or New York.
Sapstreak *Ceratocystis coerulescens*	Sugar maple	New York	No significant activity was reported in 1992.
Spruce-fir decline	Balsam fir, Red spruce	New Hampshire, New York, Vermont	No significant activity was reported in New Hampshire and New York. Vermont reported scattered mortality and dieback on 3,300 acres of upper-elevation spruce-fir forest.
Verticillium wilt *Verticillium albo-atrum*	Black maple, Norway maple, Sugar maple	Iowa	The incidence of this disease increased in urban areas surveyed in Iowa.
Abiotic Damage			
Air pollution **Ozone** **Sulfur dioxide**	Austrian pine, Black cherry, Eastern white pine	Maine, Michigan, New Hampshire, Vermont	There was trace to moderate damage on 1,000 acres in Maine. White and Austrian pine near the urban area of Portland were affected. No significant activity was reported from Michigan. Ozone monitoring continued in wilderness areas in New Hampshire and Vermont. Concentration levels during the 1992 growing season were very low and attributed primarily to cool, wet weather conditions. Vegetation surveys of ozone indicator species were conducted in New Hampshire and Vermont. Plants reflected the low concentrations and few showed symptoms of ozone injury.
Drought	Conifers, Hardwoods	Iowa, Minnesota, Vermont, Wisconsin	Mortality of Scotch and eastern white pine was reported on 25 acres of Christmas tree plantations in Iowa. There were over 37 million paper birch trees with dieback from drought in Minnesota. Early summer drought in Vermont caused moderate damage and leaf scorch on 2,000 acres of sugar maple. Damage was less than in 1991 but in the same northeastern area. Drought was also the probable cause of chlorosis on 4,000 acres of maple and beech. In Wisconsin, a 3-year survey showed that in 1990, 1991 and 1992, respectively, 73, 88 and 79 percent of paper birch were healthy and 4, 5 and 15 percent were killed by drought.

Eastern Region and Northeastern Area--Status of diseases in Connecticut, Delaware, 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
Flooding	Cottonwood, Bottomland hardwoods	Iowa, Vermont	About 100 trees were killed from flooding in Iowa. Vermont reported inundation on 8,000 acres.
Frost Damage	Conifers, Hardwoods	Iowa, Maine, Michigan, Missouri, New Hampshire, New York, Pennsylvania, Vermont	Over 2 million acres sustained frost damage in the western two-thirds of Iowa. Maine reported trace to moderate frost injury to 12,000 acres of spruce-fir and northern hardwood forest. There was light damage on 1,000 acres of plantation trees. Over 2 million acres of red and white oak were damaged in Michigan. This area coincided with areas of gypsy moth defoliation. In Missouri, over 9 million acres of maple, ash, sycamore, and conifers were affected by frost. Approximately 1,000 acres were affected by a late spring frost in New Hampshire. There was 60-100 percent damage on 25,000 acres of scrub oak in New York. An event of frost killed leaves during bud break. Frost damaged 87,000 acres of forest in two counties of Pennsylvania. Vermont reported moderate damage from a late spring frost to 3,300 acres of northern hardwoods. Damage to aspen-birch forest in Essex County was also reported.
Ice storm Damage	Ornamentals	Minnesota	About 4,000 acres of urban and ornamental trees were affected in Minnesota. About $1,000,000 in Federal disaster relief was provided for cleanup and replacement of trees.
Wind injury	Conifers, Hardwoods	Maine, Vermont	Damage from wind was reported on 24,000 acres in Maine. In Vermont, there was heavy windthrow on 100 acres from an August storm.
Winter injury	Conifers	Illinois	Over 800 conifer trees were affected in four counties.
Other Damage			
Stillwell's syndrome	Balsam fir	Maine	The occurrence of this condition increased in 1992 after several years of decline. Stress factors such as previous spruce budworm damage and weather increased the success of infection from *Armillaria* spp. on 7,000,000 acres of spruce-fir forest.

Disease	Host	Location	Remarks
White oak tatters	White oak	Indiana	This condition was reported for the second consecutive year on outplanted seedlings and is causing serious foliar damage.

Alaska Region Insects

Prepared by Edward H. Holsten

Insect	Host	Location	Remarks
Birch borer *Synanthedon culiciformis*	Paper birch	Southcentral and Interior Alaska	Clear-wing moth damage to ornamental birch is widespread throughout the Anchorage bowl. This insect was first described from Alaska in the late 1800's. Since then no specimens or damage were observed until 1989. Damage (phloem consumption) results in weakened trees which are susceptible to pathogen entry and subsequent wind breakage.
Birch Defoliation *Sunira verberata* *Parastichtis discivaria*	Birch	Southcentral Alaska	A few hundred acres of birch were heavily defoliated on Ft. Richardson military land near Anchorage in 1991. Causal agents were identified as *Sunira verberata* (Smith) and *Parastichtis discivaria* (Wlkr.). Both noctuids are transcontinental in distribution and are not noted as important defoliators. Populations did not increase this year as expected.
Birch leafroller *Epinotia solandriana*	Birch	Southcentral Alaska	No significant activity was reported in 1992.
Bud moth *Zeiraphera* sp.	Sitka spruce	Southeast Alaska	No significant activity was reported in 1992.
Cone and seed insects *Cydia youngana* *Dasineura rachiphaga* *Hylemia* sp.	White spruce	Interior and Southcentral Alaska	No significant activity was reported in 1992.
Cottonwood defoliators *Chrysomela* sp. *Lyonetia* sp.	Black cottonwood	Prince William Sound and Southeast Alaska	Leaf beetle and blotch-miner defoliation significantly declined in south-central Alaska; only 234 acres of cottonwood defoliation were observed in Prince William Sound. Cottonwood defoliation in southeast Alaska, however, increased slightly in 1992. More than 6,000 acres of defoliation were detected along the Dangerous, Katzehin, Stikine, Skagway and Taiya Rivers.

Alaska Region--Status of insects in Alaska.

Insect	Host	Location	Remarks
Eastern larch beetle *Dendroctonus simplex*	Eastern larch	Interior Alaska	Larch beetle activity was observed on approximately 2,000 acres in northwest Alaska near Norutuk Lake. Larch beetle activity will continue to be scattered and low as most of the susceptible host material was killed in the large infestation of the early 1970's.
Engraver beetle *Ips perturbatus*	White spruce	Interior Alaska	Engraver activity decreased in 1992 with only 1,892 acres of infested white spruce detected in scattered pockets along the Yukon, Chandalar and Porcupine Rivers in interior Alaska. The expected increase in *Ips*-caused tree mortality in the Fairbanks area did not occur as expected.
Gall midge *Chamaediplosis* sp.	Yellow-cedar	Southeast Alaska	A newly detected gall midge was noted on yellow-cedar saplings. The midges cause galls on cedar foliage. Their impact is not yet known.
Giant conifer aphid *Cinara* sp.	Sitka spruce	Southcentral Alaska	No significant activity was reported in 1992.
Gypsy moth *Lymantria dispar*		Throughout Alaska	Only two male European gypsy moths have been trapped in Alaska; one in a campground near Anchorage in 1987 and the other in a campground near Fairbanks in 1992. The Alaskan pheromone trapping program was expanded in 1992 due to increased concern over the potential introduction of the more damaging Asian gypsy moth. More than 300 traps were placed throughout Alaska; no Asian gypsy moths were encountered.
Hemlock sawfly *Neodiprion tsugae*	Western hemlock	Southeast Alaska	Sawflies defoliated more than 6,000 acres of western hemlock, a significant increase over 1991 levels. Sawfly activity is expected to increase on the southern Tongass National Forest in 1993.
Large aspen tortrix *Choristoneura conflictana*	Quaking aspen	Southcentral and Interior	Tortrix populations increased slightly throughout Alaska's quaking aspen stands where 19,521 acres of defoliated aspen were detected this year versus 4,120 acres in 1991. The majority of the 1992 damage occurred along the Richardson Highway from Glennallen to Cooper Center.

Alaska Region--Status of insects in Alaska.

Insect	Host	Location	Remarks
Sitka spruce looper Geometridae (*Melanolophia initata*)	Sitka spruce	Southcentral Alaska	No significant activity was reported in 1992.
Spearmarked black moth *Rheumaptera hastata*	Paper birch	Southcentral and Interior	No significant activity was reported in 1992.
Spruce beetle *Dendroctonus rufipennis*	Lutz spruce, Sitka spruce, White spruce	Throughout Alaska	Spruce beetle activity increased for the fourth consecutive year; more than 600,000 acres of on-going and new infestations were mapped this year. Increased bark beetle activity occurred in the Copper River area near Chitina and the Clam Gulch Tustumena Lake areas on the Kenai Peninsula. The Yukon River outbreak decreased significantly in 1992. Spruce beetle activity increased slightly in southeast Alaska where more than 25,000 acres of infested Sitka spruce were detected within Glacier Bay National Park and on state lands near Haines.
Spruce bud midge *Dasineura swainei*	Black spruce, White spruce	Southcentral Alaska	Bud midge damage is prevalent on open grown regeneration throughout the Kenai Peninsula. In many cases, multiple leaders result.
Spruce bud moth *Zeiraphera* sp.	Sitka spruce	Southeast Alaska	Bud moth defoliation was visible on approximately 5,138 acres of Sitka spruce between Dry Bay and the Akwe River southeast of Yakutat.
Spruce budworm *Choristoneura* sp.	Sitka spruce, White spruce	Interior and Southeast Alaska	Budworm populations increased substantially in Alaska's white spruce stands near Fairbanks, Delta Junction and the Yukon River, where more than 160,000 acres of mature white spruce were defoliated, the heaviest budworm defoliation ever seen in interior Alaska. Budworm also caused heavy defoliation of Sitka spruce and western hemlock for the third consecutive year along the Chilkat River near Haines.
Spruce needle aphid *Elatobium abietinum*	Sitka spruce	Southeast Alaska	Following the mild winter of 1991-92, large spruce needle aphid populations defoliated more than 25,000 acres of Sitka spruce throughout southeast Alaska. Impact was most severe in urban settings and along maritime shorelines. Tree mortality is possible for the more heavily defoliated trees, especially young growth.

Alaska Region--Status of insects in Alaska.

Insect	Host	Location	Remarks
Striped alder sawfly *Hemichroa crocea*	Alder	Southeast Alaska	Riparian zone alder in a few areas in southeast Alaska were defoliated (700 acres) by large populations of the striped alder sawfly, a pest commonly encountered in coastal southeast Alaska. Alder defoliation was noted along the Stikine River for the second consecutive year. Heavy defoliation presumably slows the growth rate of affected shrubs.
Western black-headed budworm *Acleris gloverana*	Sitka spruce, Western hemlock	Prince William Sound and Southeast Alaska	Black-headed budworm populations defoliated over 87,000 acres of mature western hemlock and Sitka spruce in areas located primarily north of Frederick Sound in southeast Alaska. Budworm defoliation decreased significantly in Prince William Sound in 1992. However, budworm populations increased for the first time along Turnagain Arm south of Anchorage, where more than 3,600 acres of Sitka spruce and western hemlock were defoliated.
Willow defoliation Tortricidae Chrysomelidae	Willow	Southcentral and Interior Alaska	1992 aerial surveys detected approximately 150,000 acres of heavily defoliated willow, 20,000 acres more than last year. The most heavily defoliated areas continue to be the riparian zones along the Yukon, Kuskokwin, Mulchatna and Nushagak Rivers as well in the Lake Clark/Iliamna areas, Seward and Kenai Peninsulas. Assorted leaf miners, noctuids, rusty tussock moth and leaf beetle larvae were responsible for the majority of the defoliation, which was a result of four consecutive warm, dry springs and summers throughout interior Alaska.

Alaska Region--Status of insects in Alaska.

Alaska Region Diseases

Prepared by Paul E. Hennon

Disease	Host	Location	Remarks
Stem and Branch Diseases			
Hemlock canker *Xenomeris abietis*	Mountain hemlock, Western hemlock	Southeast Alaska	The combination of *X. abieti* and dust killed understory hemlocks and the lower crown of large hemlock trees along more than 60 miles of unpaved roads on Prince of Wales Island. New outbreaks were detected near Rowan Bay (Kuiu Island), Corner Bay (Chichagof Island) and Carroll Inlet (Revillagigedo Island) in 1992.
Hemlock dwarf mistletoe *Arceuthobium tsugense*	Western hemlock	Southeast Alaska	Abundant in southeast Alaska from Dixon Inlet to the Haines area. Absent to the northwest within the remaining range of host type. In some old-growth unmanaged stands, the disease enhances structural diversity and wildlife habitat by reducing growth of some trees and by producing brooms and snags. The disease is so prevalent in other stands as to cause canopy collapse. Western hemlock in young-growth managed stands with large residuals are frequently infected and suffer growth loss, deformity and mortality.
Spruce broom rust *Chrysomyxa arctostaphyli*	Black spruce, Lutz spruce, Sitka spruce, White spruce	Interior and Southcentral Alaska	Common wherever spruce grows with the alternate host kinnikinnik. Caused witches-brooms and an undetermined growth loss in spruce. Witches-brooms are important hiding and nesting habitat for wildlife.
Stem cankers *Encoelia pruinosa* *Ceratocystis fimbriata* *Cryptosphaeria populina* *Cytospora chrysosperma*	Hardwoods	Throughout Alaska	Stem cankers caused an unmeasured level of mortality in hardwoods, particularly in southcentral and interior Alaska. On surviving trees, cankers allow wood decay fungi to enter and initiate heartrot. Canker fungi were important mortality agents of aspen, birch, poplar and mountain ash.

Alaska Region--Status of diseases in Alaska.

Disease	Host	Location	Remarks
Stem decays Many Basidiomycetes	All tree species	Throughout Alaska	Stem decays caused an enormous but largely unmeasured loss of wood volume throughout Alaska. Loss was considerable in unmanaged, old-growth stands where trees are long-lived and fungi have ample time to cause decay. Heartrot fungi are important disturbance factors in gap-formation and the dynamics of coastal old-growth forests. Decay rates of wounded spruce and hemlock in managed stands were found to be less than expected, probably because of Alaska's cool climate.
Western gall rust *Endocronartium harknessii*	Shore pine	Southeast Alaska	Abundant throughout the range of pine in Alaska every year. Spherical, perennial galls are produced. When the gall dies, sometimes the result is secondary infection by *Nectria macrospora* and all distal tissues die. This resulted in many pines with dead branches or tops in 1992.
Root Diseases			
Armillaria root rot *Armillaria* spp.	All tree species	Throughout Alaska	Typically occurred as a secondary invader of trees already experiencing a stress such as cedar decline.
Pholiota and Coniophora butt rots *Pholiota alnicola* *Coniophora puteana*	Lutz spruce, White spruce	Southcentral and Interior Alaska	Common cause of root and butt rots which reduce volume and create hazardous trees.
Schweinitzii butt rot *Phaeolus schweinitzii*	Lutz spruce, Sitka spruce, White spruce	Southeast and Southcentral Alaska	Common in old-growth stands and even-aged stands over 100 years old. Caused volume loss and hazardous trees in recreation areas.
Tomentosus root rot *Inonotus tomentosus*	Lutz spruce, White spruce	Southcentral and Interior Alaska	Caused root and butt rot of spruce. Killed some trees and predisposed others to attack by bark beetles.
Foliage Diseases			
Shoot blight *Apostrasseria* sp.	Yellow-cedar	Southeast Alaska	Damaged regenerating cedar seedlings and saplings by killing terminal and lateral shoots. Incidence does not vary much from year-to-year. Damage to planted seedlings is greatest on sites with infected cedar nearby.

Alaska Region--Status of diseases in Alaska.

Disease	Host	Location	Remarks
Sirococcus shoot blight *Sirococcus strobilinus*	Sitka spruce, Western hemlock	Southeast Alaska	Occurred at moderate levels in managed young-growth stands. For unknown reasons, the disease is prevalent in some areas, such as Thomas Bay, every year.
Spruce needle blight *Lirula macrospora*	Sitka spruce	Coastal Alaska	Occurred at average levels in young-growth stands and in ornamental trees throughout the range of Sitka spruce. *Rhizosphaera pini* and *Lophodermium picae* were found causing considerable damage to white spruce needles in the Anchorage area.
Spruce needle cast *Lirula macrospora*	Sitka spruce	Coastal Alaska	No significant activity reported in 1992.
Spruce needle rust *Chrysomyxa ledicola*	Lutz spruce, Sitka spruce, White spruce	Southwest, Southcentral and Southeast Alaska	Occurred at average levels this year. Last year's epidemics near Dillingham and on the Kenai Peninsula have subsided. Although infected trees appear unsightly, little damage usually occurs unless trees are infected for several consecutive years.
Venturia leaf blight *Venturia populina*	Quaking aspen	Southcentral Alaska	Occurred at low levels in 1992, following last year's outbreak on several thousand acres of aspen.
Vascular Wilts and Declines			
Yellow-cedar decline	Yellow-cedar	Southeast Alaska	Decline persists as one of the most significant forest problems in Alaska. Over 570,000 acres of unmanaged stands on moderately and poorly drained sites have dying, recently killed, and long-dead cedar trees. Succession is occurring towards western and mountain hemlock in some declining stands. Research indicates that no biotic agent is the primary cause of decline and cedar has experienced a high rate of mortality since about 1880.
Other Damage			
Brown bear *Ursus arctos*	Yellow-cedar	Southeast Alaska	More than one half of cedar trees in many stands on Baranof and Chichagof Islands have old or recent scars caused by brown bears. Bears wound cedars every spring, apparently to feed on the cambium, but do not harm other tree species.

Alaska Region--Status of diseases in Alaska.

Disease	Host	Location	Remarks
Hemlock fluting	Western hemlock	Southeast Alaska	Deep grooves and raised ridges on the boles of western hemlock characterize fluting. This causes bark to be buried internally in wood and results in commercial loss of wood quality and quantity. Incidence does not fluctuate from year to year. Fluting does not appear to be caused by any biotic factor, but is common on certain soil types and may be triggered by growth release.
Porcupine *Erethizon dorsatum*	Shore pine, Sitka spruce, Western hemlock	Southeast Alaska	Porcupines caused considerable bole damage and mortality in commercially important young-growth stands in southeast Alaska. Damage was severe on Mitkof Island, Anita Bay on Etolin Island and in the Juneau area, but scattered porcupine feeding also occurred throughout the range of the animal. Basal scarring was common on larger, older trees in many areas. Shore pine was heavily damaged in the Haines area.
Winter Injury	Alder, Blueberry, Sitka spruce, Mountain hemlock, Western hemlock	Southeast Alaska	Spring frosts damaged vegetation in scattered locations throughout southeast Alaska. Damage was severe in the Gustavus area where many Sitka spruce trees died.

Alaska Region--Status of diseases in Alaska.

Part 3 Indexes

Index - Insects

(Forest Insect and Disease Conditions in the United States 1992)

The common and scientific names of the insects come from "Common Names of Insects and Related Organisms," published in 1989 by the Entomological Society of America, and two U.S. Department of Agriculture publications: "Western Forest Insects" (Miscellaneous Publication 1339; 1977) and "Insects of Eastern Forests (Miscellaneous Publication 1426; 1985).

Index - Diseases

(Forest Insect and Disease Conditions in the United States 1992)

The common and scientific names of the disease-causing organisms are based on the compendium entitled "Common Names for Tree Diseases in the Western United States and Western Canada" by Hawksworth, Gilbertson, and Wallis (a 1985 supplement to the proceedings of the 32nd annual Western International Forest Disease Work Conference) and "Diseases of Forest and Shade Trees of the United States" by George Hepting (Agriculture Handbook 386; 1971). Based on continuing taxonomic research, many scientific names have been changed.

The Center for Forest Mycology Research at the Forest Service's Forest Products Laboratory in Madison, WI, is the information source for name changes.

Synonyms of recently changed names are in parentheses in the disease sections in Part II; anamorphs are shown in brackets. This differentiation is not made in the index.