United States
Department of
Agriculture

Forest Service

FS-933

September 2009

Major Forest Insect and Disease Conditions in the United States 2008 Update

United States
Department of
Agriculture

Forest Service

FS-933

September 2009

Major Forest Insect and Disease Conditions in the United States 2008 Update

Disclaimer

Cover photo: *Mountain pine beetle mortality on the Medicine Bow National Forest, WY. Photo by Brian Howell, Forest Service.*

Preface

This report represents the 58th annual report prepared by the Forest Service, U.S. Department of Agriculture, of the major insect and disease conditions of the Nation's forests. This year's forest insect and disease conditions report has been redesigned to focus on the 20 major insects and diseases that annually cause defoliation and mortality in forests of the United States. Last year's report, *Major Forest Insect and Disease Conditions in the United States 2007*, (http://www.fs.fed.us/foresthealth/publications.shtml#reports) provides background information on the 20 insects and diseases described in this report and should be referenced if more detailed information is needed. This report provides a national summary of the major changes and status of these 20 forest pests with updated charts, tables, and maps. We plan to produce a more detailed report every 3 to 5 years to update longer term trends, science, treatments, and outlook. We are in the process of developing a database and linking it to other datasets so that interested users will have access to more information and will be able to do their own analyses, especially over time. A primary goal is to make the database useful and user friendly to those interested in this type of information.

The information in this report is provided by the Forest Health Protection program of the Forest Service and its State partners. This program serves all Federal lands, including the National Forest System and the lands administered by the U.S. Department of Defense and the U.S. Department of the Interior. The program also provides service to tribal lands. The program provides assistance to private landowners through the State foresters and other State agencies. A key part of the program is detecting and reporting insect and disease epidemics. State and Forest Service program specialists regularly conduct detection surveys.

For additional information about conditions, contact the Forest Service office listed on the next page (see map for office coverage) or your State forester.

United States Department of Agriculture

Forest Service
Forest Health Protection Offices

Forest Service, Washington Office
Stop Code 1110
1400 Independence Avenue, SW.
Washington, DC 20250–1110

703–605–5344

Forest Service
Northern Region (R-1)
P.O. Box 7669
Missoula, MT 59807
406–329–3308

Forest Service
Pacific Northwest Region (R-6)
P.O. Box 3623
Portland, OR 97208–3623
503–808–2913

Forest Service
Rocky Mountain Region (R-2)
P.O. Box 25127
Denver, CO 80225
303–275–5026

Forest Service
Southern Region (R-8)
1720 Peachtree Road, NW., Room 816 N
Atlanta, GA 30309
404–347–3540

Forest Service
Southwestern Region (R-3)
333 Broadway Boulevard, SE.
Albuquerque, NM 87102
505–842–3247

Forest Service
Northeastern Area
11 Campus Boulevard, Suite 200
Newtown Square, PA 19073
610–557–4139

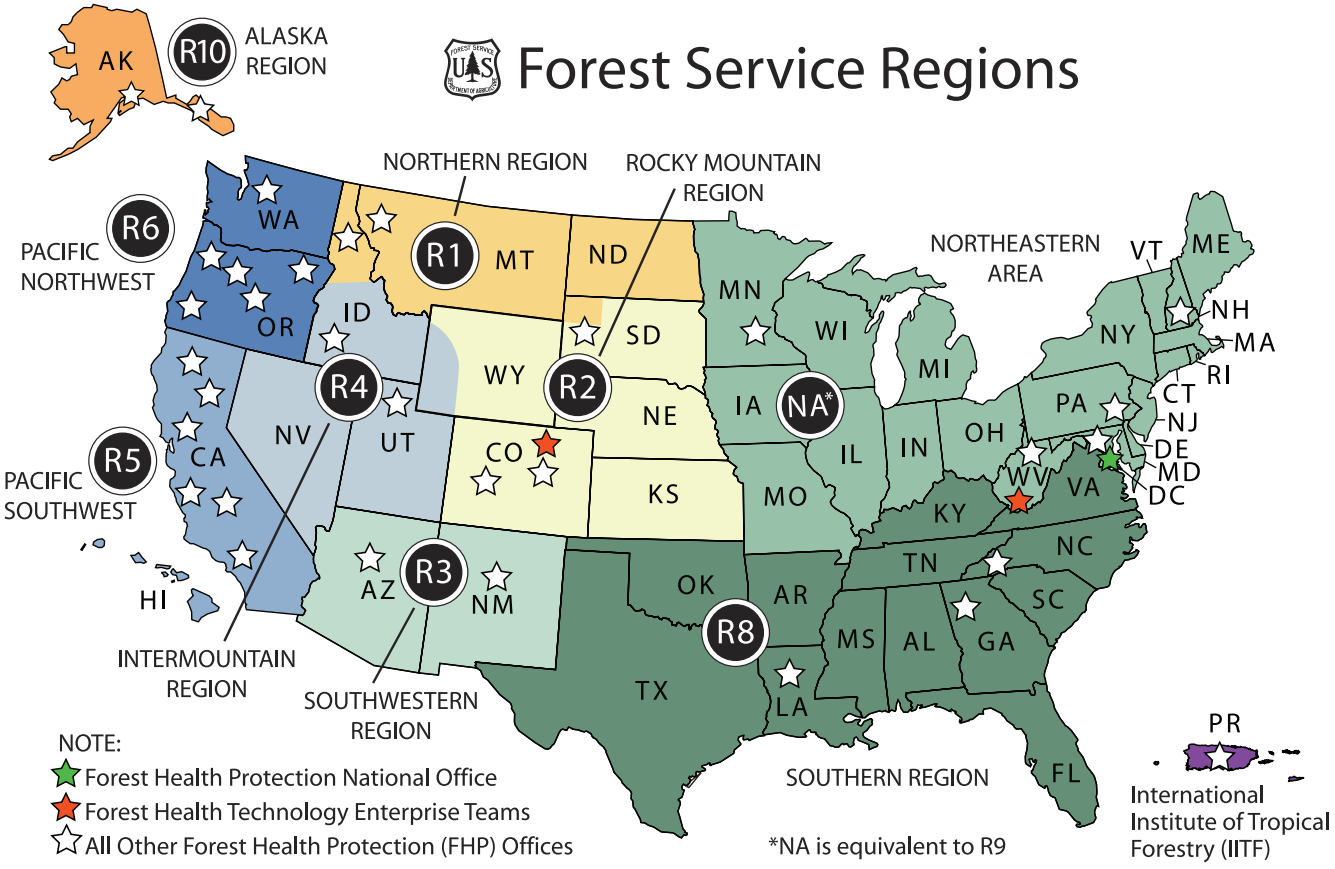
Forest Service
Intermountain Region (R-4)
324 25th Street
Ogden, UT 84401
801–625–5759

Forest Service
Alaska Region (R-10)
3301 C Street, Suite 202
Anchorage, AK 99503–3956
907–743–9455

Forest Service
Pacific Southwest Region (R-5)
1323 Club Drive
Vallejo, CA 94592
707–562–8921

Forest Service
International Institute of Tropical Forestry
UPR Experiment Station Grounds
P.O. Box 25000
Rio Piedras, PR 00928–5000
787–766–5335

Forest Service Regions and Area



Copies of this report are available from:

Forest Service, U.S. Department of Agriculture
Attn: Forest Health Protection
1400 Independence Avenue, SW.
Stop Code 1110
Washington, DC 20250–1110
Phone: 703–605–5352
Fax: 703–605–5353
E-mail: lturner04@fs.fed.us

This report is also available on the Internet at http://www.fs.fed.us/foresthealth/current_conditions.shtml. http://www.fs.fed.us/foresthealth/publications.shtml#reports.

Contents

Executive Summary/Introduction

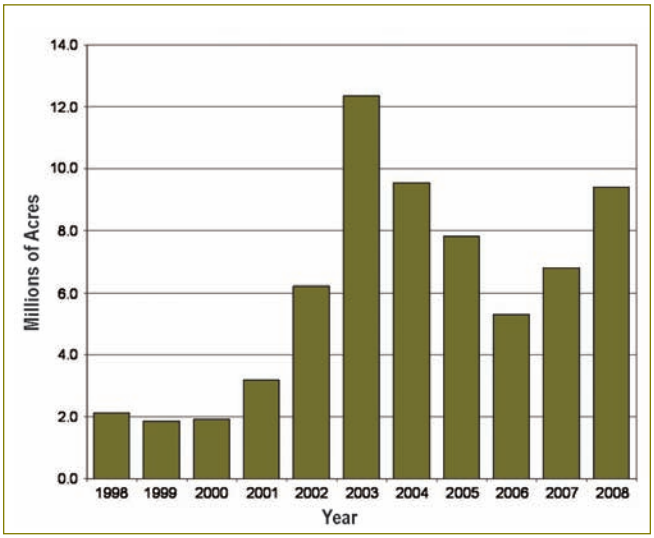
The United States ranks fourth in the world for the amount of forest cover, which provides a rich natural resource for its citizens and the world as a whole. The Nation's approximately 750 million acres classified as forest land not only provide the goods and services for domestic use but also play an important role in the global economy and environment. The forests of the United States continue to provide high-valued timber and other products for export to other countries, a vast carbon sink to sequester carbon emissions from around the globe, and recreational opportunities for domestic and international visitors. To provide these goods and services, we need healthy forests, especially on a long-sustainable basis. One aspect of maintaining and even enhancing a healthy forest is to protect and restore forests from native and nonnative insects and diseases, which can cause significant damage. Surveys describing the forest insect and disease conditions are important tools to help prioritize actions by Federal agencies, States, and other stakeholders. As with most biological systems, the overall mortality that insects and diseases cause varies from year to year and pest to pest. The following chart (fig. 1) illustrates how mortality has varied over the past 11 years.

Acres of Tree Mortality Caused by Insects and Diseases

In 2008, nearly 9.0 million acres of mortality caused by insects and disease were reported nationally, a 2.2-million-acre increase from 2007, when 6.8 million acres of mortality were reported. Nearly 69 percent of the mortality was caused by one pest, the mountain pine beetle, a native pest found in Western U.S. forests. Although only mortality is represented in the chart, defoliation has significant effects on our forests. The European gypsy moth caused more than 1.5 million acres of defoliation damage in 2008. A single infestation by gypsy moth larvae on a tree usually does not cause mortality, but, combined with continued attacks or severe weather factors, trees can succumb to this nonnative insect.

Every year, hundreds of native and nonnative insects and diseases damage our Nation's forests. The following pages describe 20 of the major insects and diseases that annually contribute to mortality and defoliation. In addition, we have added a section for recently identified pests in the United States that we are monitoring.

Figure 1.—*Surveyed acres of mortality from 1998 to 2008.*



Mountain Pine Beetle

Dendroctonus ponderosae Hopkins

In 2008, aerial surveys detected about 6.2 million acres where mountain pine beetles were actively killing trees (fig. 1). Millions of acres were affected in California, Colorado, Idaho, Montana, Nevada, Oregon, South Dakota, Utah, Washington, and Wyoming (fig. 2). The mountain pine beetle epidemic in the central Rocky Mountains continues to expand both west of the Continental Divide and across the northern Front Range in Colorado. Central Montana reported significantly more mountain pine beetle mortality in 2008 as compared with 2007. Outbreaks continue in northern Utah on the Wasatch-Cache and Ashley National Forests, the Black Hills of South Dakota, and throughout Wyoming (fig. 3). A mountain pine beetle infestation has been reported on the Apache-Sitgreaves National Forests in Arizona, believed to be the first report on the forest (fig. 4).

Figure 1.—*Mountain pine beetle activity has risen dramatically since 2000 in much of the Western United States.*

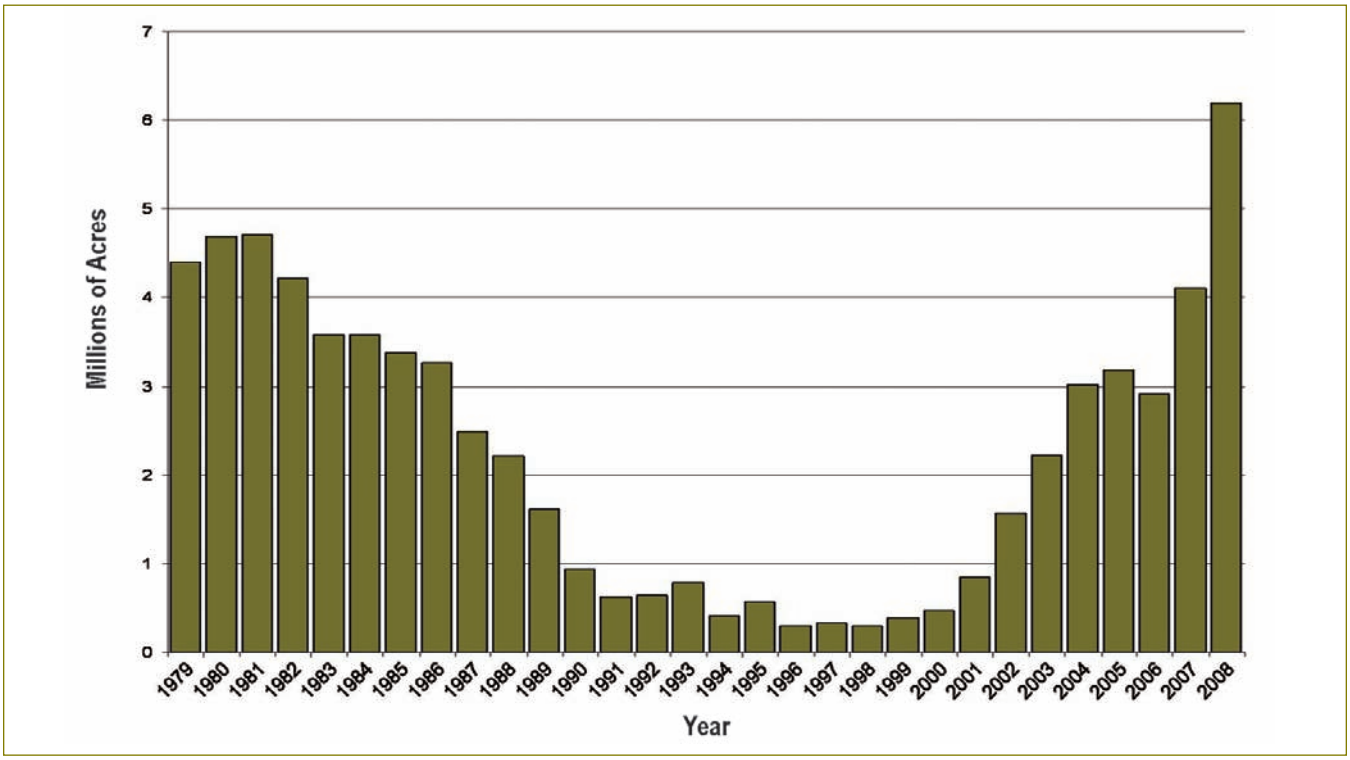


Figure 2.—*Mountain pine beetle mortality in 2008 by State.*

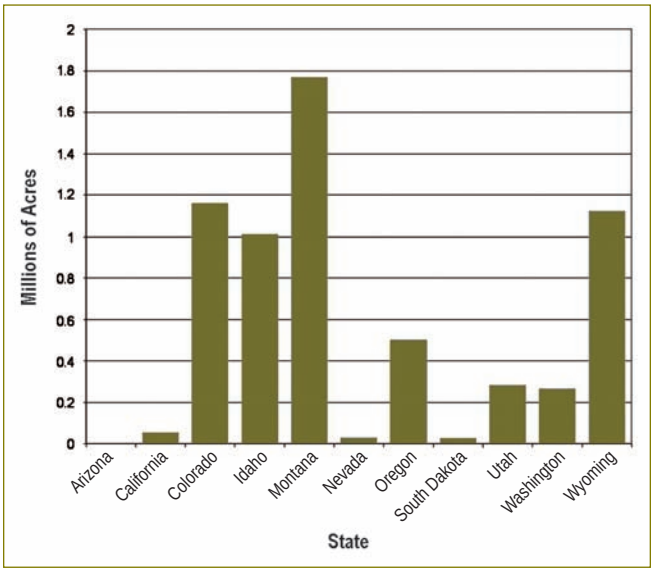
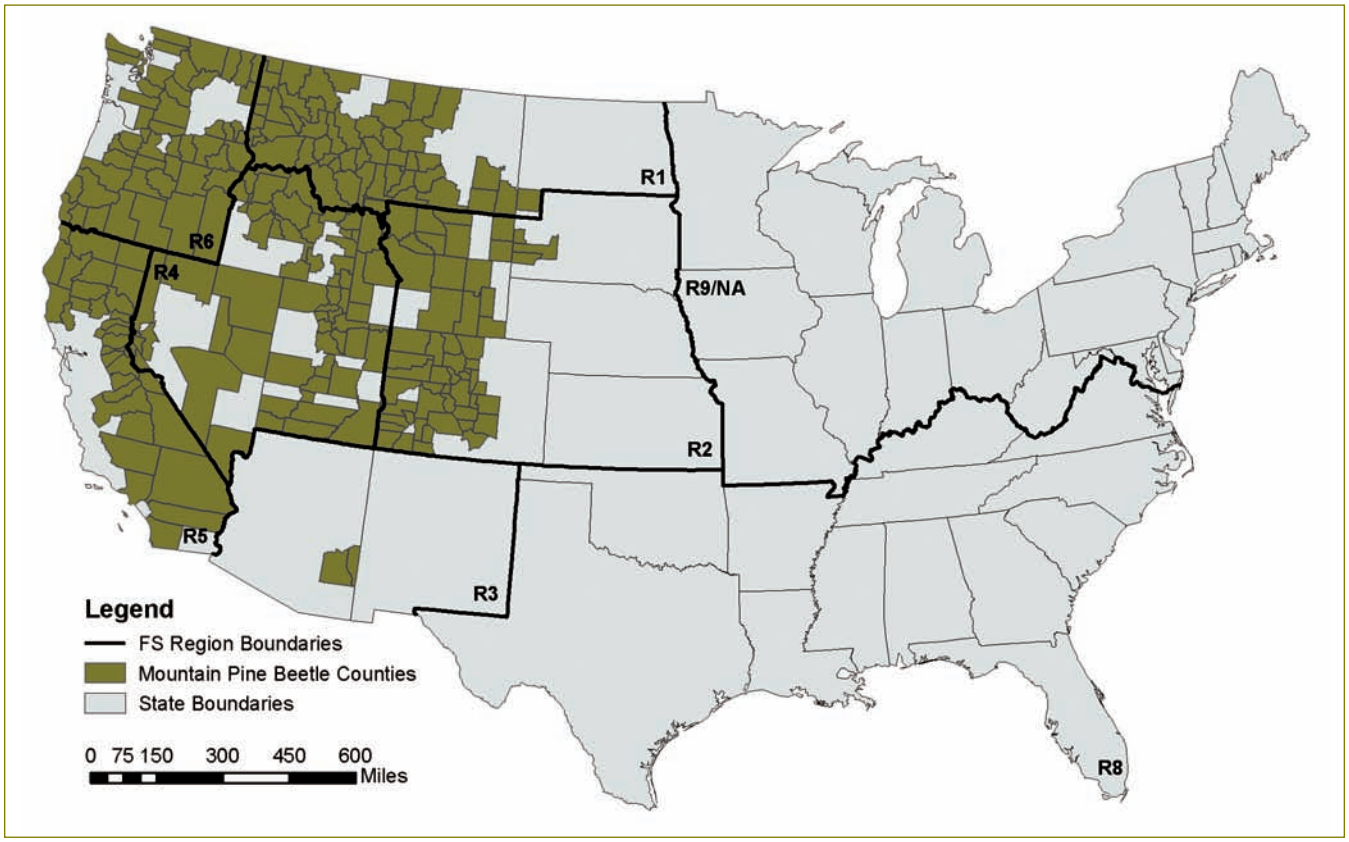


Figure 3.—*Pine mortality from mountain pine beetle in Yellowstone National Park, WY. Photo by John Schwandt, Forest Service.*

Figure 4.—*Counties where mountain pine beetle was reported in 2008.*



Gypsy Moth

Lymantria dispar Linnaeus

Since its introduction, the gypsy moth has become established in all or parts of 19 Eastern States and the District of Columbia (fig. 1). In 2008, more than 1.5 million acres of forests were defoliated by gypsy moths, similar to the number in 2007 (1.4 million acres defoliated) (fig. 2). Over one-half of the defoliation occurred in Pennsylvania (768,800 acres). Michigan, New Jersey, Virginia, and West Virginia also reported significant defoliation totaling more than 656,000 acres (fig. 3).

Figure 1.—*As of 2008, gypsy moth quarantines were established in all or parts of 19 Eastern States and the District of Columbia.*

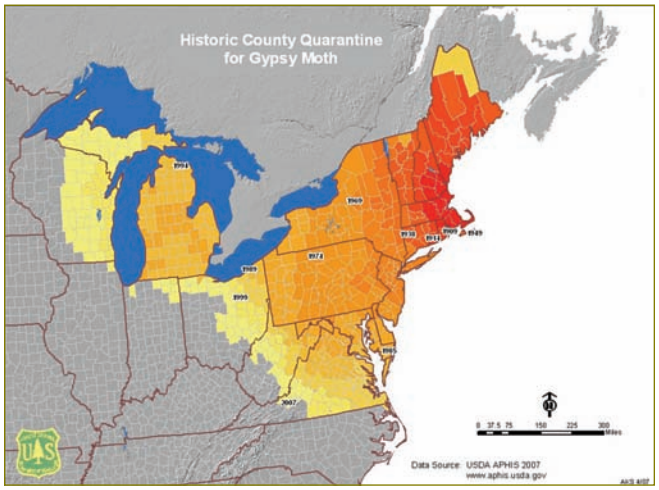


Figure 2.—*Gypsy moth defoliation from 1924 to 2008.*

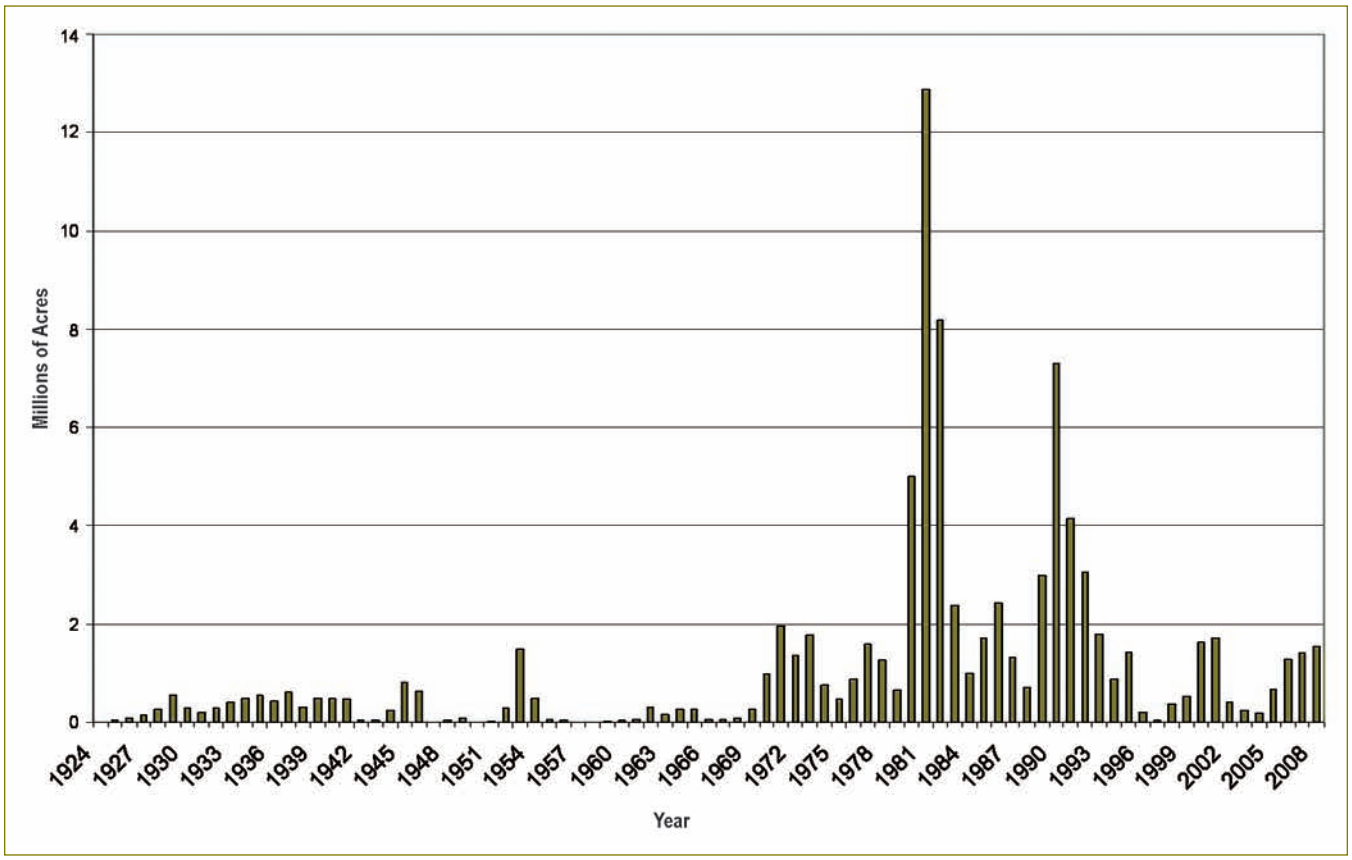


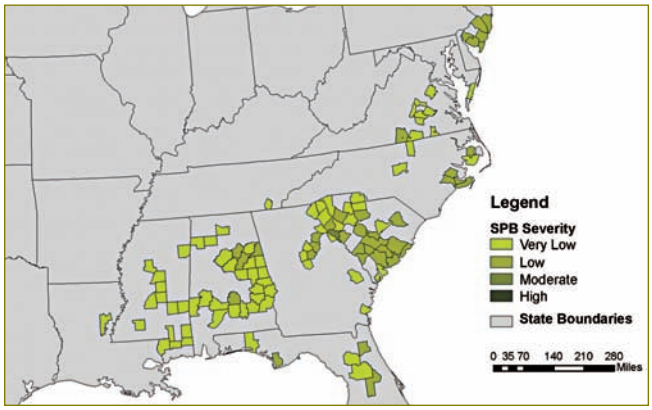
Figure 3.—*Aerial view of gypsy moth defoliation in Virginia in 2008. Photo by the Virginia Department of Forestry.*

Southern Pine Beetle

Dendroctonus frontalis Zimmermann

In 2008, southern pine beetle infestations were reported in Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, and Virginia in the South at historically low levels (figs. 1 and 2). An estimated total of only 1,100 acres were affected in these eight Southern States (fig. 3 and table 1). New Jersey reported more than 3,800 acres of light, scattered mortality in the southern portion of the State.

Figure 1.—*Counties with southern pine beetle infestations in 2008.*



Outbreak Classes
Very low (≤ 0.1 spots per thousand acres of host type).
Low (> 0.1 to ≤ 1.0 spots per thousand acres of host type).
Moderate (> 1.0 to ≤ 3.0 spots per thousand acres of host type).
High (> 3.0 spots per thousand acres of host type).

Figure 2.—*Mortality caused by southern pine beetles on the Chattahoochee National Forest, GA. Photo by Forest Service.*

Figure 3.—*Southern pine beetle outbreaks, 1979 to 2008. Note: The 2007 and 2008 surveys counted outbreak acres differently than in previous years. Previously, all acres in a county were counted if a single spot was positive for southern pine beetles. The 2007 and 2008 surveys reflect only the estimated actual affected areas by southern pine beetles (10,117 and 4,961 acres, respectively).*

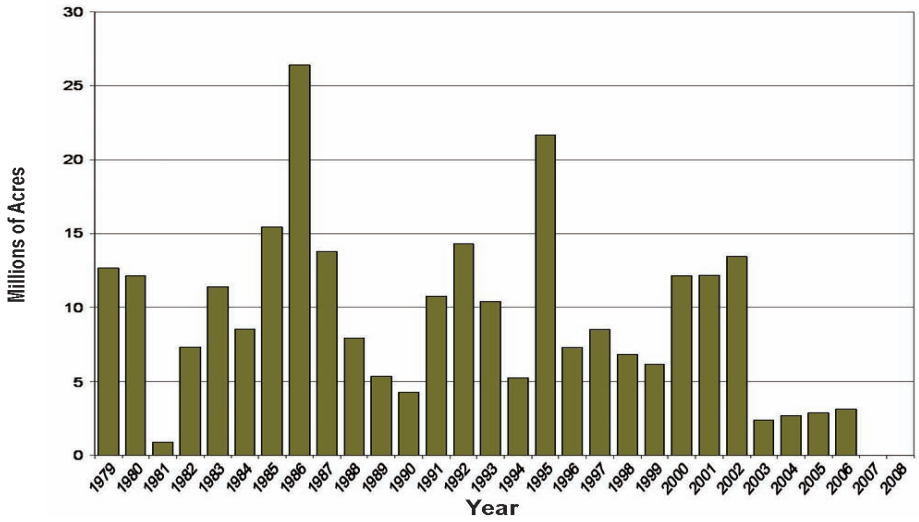


Table 1.—*Southern pine beetle activity by State in 2008.*

State	Acres Infested 2008	Number of Spots 2008[1]
Alabama	26	222
Arkansas	0	0
Florida	213	22
Georgia	115	115
Kentucky	0	0
Louisiana	8	1
Mississippi	3	31
New Jersey[2]	3,868	—
North Carolina	374	131
Oklahoma	0	0
South Carolina	166	1,000
Tennessee	0	1
Texas	0	0
Virginia	188	33
Total	**4,961**	**1,556**

[1] *Spot size and density vary, so number of spots does not directly correlate to acres infested.*

[2] *No spot information for New Jersey.*

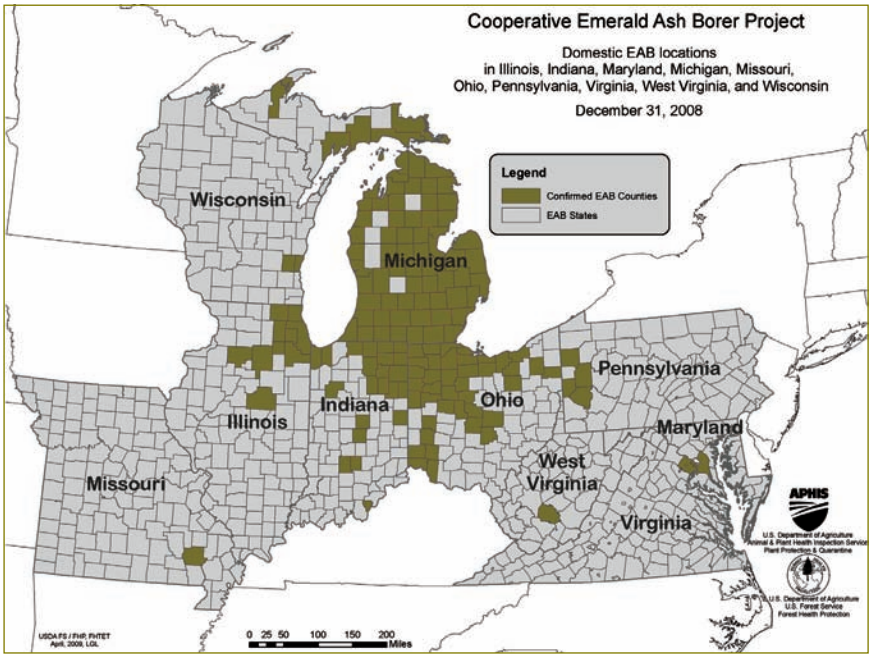
Emerald Ash Borer

Agrilus planipennis Fairmaire

New emerald ash borer infestations for 2008 have been verified in Missouri, Virginia, and Wisconsin (fig. 1). It is not clear if the current infestation in Virginia is from a new source or a previous introduction that was thought to have been eradicated in 2004. The borer continues to spread in previously infested States. Federal and State quarantines have been established in all or parts of all infested States (fig. 2).

Figure 1.—*Dead and dying ash trees on the property where the emerald ash borer was first found in Wisconsin.*

Figure 2.—*By the end of 2008, the emerald ash borer had been detected in 132 counties across 7 States, including new infestations in Missouri, Virginia, and Wisconsin.*



Sudden Oak Death

Phytophthora ramorum Werres et al.

Phytophthora ramorum, the causal agent of sudden oak death, continues to kill trees (fig. 1), including tanoak (*Lithocarpus densiflorus*), California live oak (*Quercus agrifolia*), Shreve oak (*Q. parvula*), and California black oak (*Q. kelloggii*) throughout the same 15 counties in the central and northern coastal areas of California and the extreme southwestern corner of Oregon as in 2007. A new infestation was found outside the quarantine area in Curry County, OR, but still within the county. The quarantine boundaries have been adjusted accordingly. The disease has also been found on nursery stock outside the infested areas of California and Oregon but has not established itself beyond nursery environs to date.

Figure 1.—*Coast live oak dying from sudden oak death in a mixed-evergreen forest in Marin County, CA. Photo by P. Svihra, University of California Cooperative Extension, Marin County.*

Spruce Beetle

Dendroctonus rufipennis Kirby

Overall, spruce beetle activity declined to 277,500 acres in 2008 as compared with 359,000 acres of mortality in 2007 (fig. 1). Activity increased at locations in Colorado and Wyoming, especially in high-elevation Englemann spruce stands. The Cook Inlet in Alaska and portions of south-central Utah also continue to experience high mortality from the spruce beetle (fig. 2).

Figure 1.—*Maps of spruce beetle-caused tree mortality detected in 2008 by aerial detection surveys.*

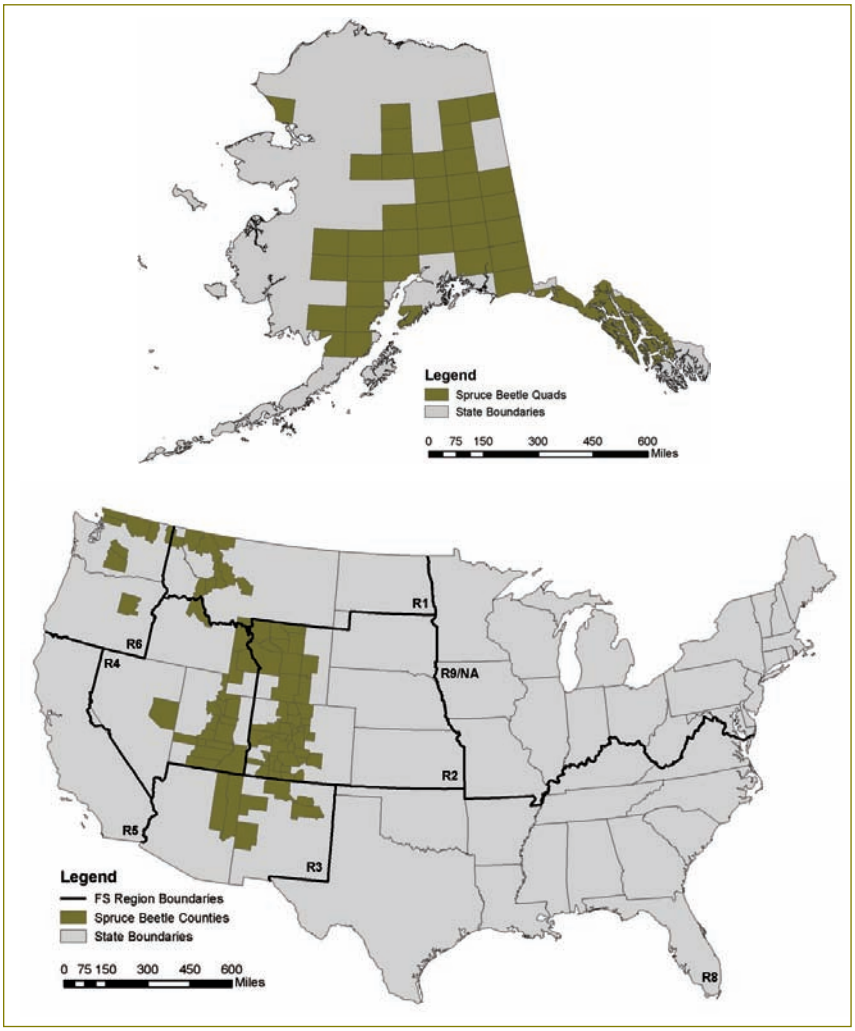


Figure 2.—*Spruce beetle infestation in Alaska. Photo by Forest Service.*

Western Bark Beetles

Numerous species

Over the past several years, widespread outbreaks of native bark beetles have occurred across the Western United States, from the low-elevation pinyon woodlands of the Southwest to the high-elevation spruce-fir forests (fig. 1). Of particular note is the effect of the mountain pine beetle. In 2008, tree mortality caused by the mountain pine beetle was observed on approximately 6.2 million acres of the total 7.97 million acres affected by all bark beetle species combined. Figure 2 shows western bark beetle outbreaks from 1997 to 2008. Table 1 shows the 2008 status of selected bark beetles that have caused significant tree mortality to their respective hosts in recent years.

Figure 1.—*Douglas-fir beetle in eastern Idaho. Photo by Idaho Department of Lands.*

Figure 2.—*Western bark beetle outbreaks from 1997 to 2008.*

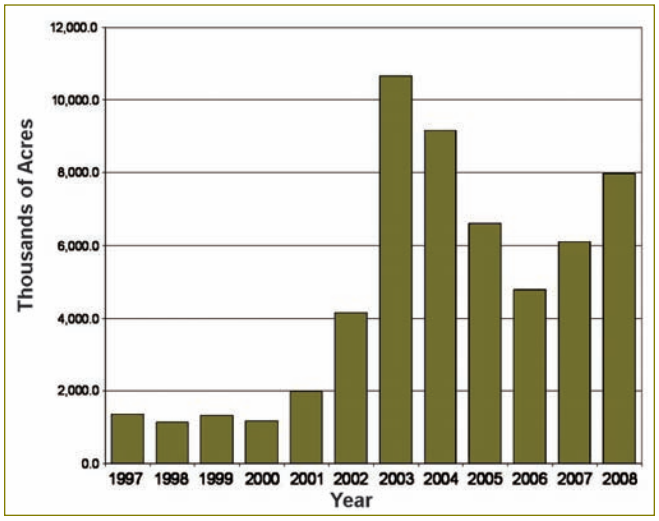


Table 1.—*Trends for selected western bark beetles and infested acres detected in aerial surveys during 2008.*

Bark Beetle(s)	Host(s)	Acres Detected With Bark Beetle Activity in 2008*	Trend
Mountain pine beetle, *Dendroctonus ponderosae* Hopkins	Ponderosa pine (*Pinus ponderosa* C. Lawson), lodgepole pine (*P. contorta* Douglas ex Louden), white pines and others (*Pinus* spp.)	6,199,709 acres	Increasing across the West in lodgepole and five-needle pines and locally in ponderosa pine forests. Some areas are seeing host depletion.
Spruce beetle, *Dendroctonus rufipennis* Kirby	Engelmann spruce (*Picea engelmannii* Parry ex Engelm.), white spruce (*P. glauca* [Moench] Voss), Sitka spruce (*P. sitchensis* [Bong.] Carr.)	210,310 acres (includes 69,474 acres in Alaska)	Alaska, Colorado, Utah, Washington, and Wyoming all report large active spruce beetle outbreaks. Some areas are seeing host depletion.
Douglas-fir beetle, *Dendroctonus pseudotsugae* Hopkins	Douglas-fir (*Pseudotsuga menziesii*)	199,736 acres	Trend is decreasing, especially in the Rockies. Slight increase in the Intermountain West.
Jeffrey pine beetle, *Dendroctonus jeffreyi* Hopkins	Jeffrey pine (*Pinus jeffreyi* Balf.)	8,565 acres	Increasing in CA on the east side of the Sierra Nevada from the Inyo National Forest north to the Lake Tahoe basin and up through the Modoc National Forest.
Western pine beetle, *Dendroctonus brevicomis* LeConte	Ponderosa pine, Coulter pine (*Pinus coulteri* D. Don)	103,535 acres	Considerable increases throughout the West from 2007, especially in the Pacific Northwest.
Western balsam bark beetle, *Dryocoetes confusus* Swaine	Subalpine fir (*Abies lasiocarpa* (Hook.) Nutt.)	532,629 acres	Ongoing, particularly in the Rocky Mountains.
Fir engraver beetle, *Scolytus ventralis* LeConte	True firs (*Abies* spp.)	492,549 acres	Significant increase in the Inland Northwest from 2007 and declines in the Southwest. Slight decline in the West. Acres affected have declined where moisture conditions have improved.
Pine engraver, *Ips pini* Say, Arizona five spined ips, *Ips lecontei* Swaine	Ponderosa pine	43,960 acres	Acres affected have declined dramatically since 2003 peak with improved moisture but are up from 2007.
Pinyon ips, *Ips confusus* LeConte	Pinyon pine (*Pinus edulis* Engelm.), singleleaf pinyon (*P. monophylla* Torr. and Fen.)	5,926 acres	Acres affected have declined dramatically since 2003 peak with improved moisture.

* *The number of dead trees per acre varies.*

Western Spruce Budworm

Choristoneura occidentalis Freeman

Since the early 1990s, budworm-caused defoliation has generally remained at relatively low levels until recent years. In 2008, more than 1.9 million acres were defoliated by the western spruce budworm, slightly less than the 2.2 million acres of defoliation in 2007 (fig. 1 and table 1). In general, most States experienced a decline of western spruce budworm defoliation, with the exception of Arizona, Idaho, Montana, and Washington (fig. 2). Colorado and New Mexico saw sharp declines, although heavy defoliation was detected in localized areas in all States. In southern Colorado, the Douglas-fir tussock moth was also reported in the same stands defoliated by the western spruce budworm.

Figure 1.—*Acres of western spruce budworm defoliation.*

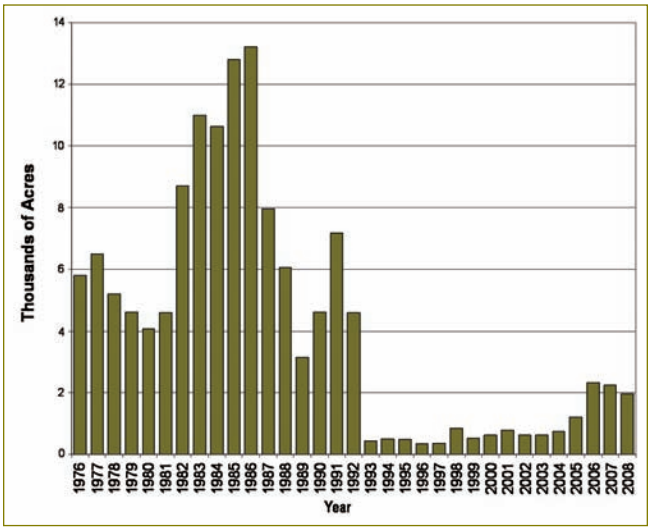


Figure 2.—*Western spruce budworm larvae weave needles together to make silken nests in which they feed. Photo by Forest Service.*

Table 1.—*Acres (in thousands) with western spruce budworm defoliation by State, 2002 to 2008.*

State	2002	2003	2004	2005	2006	2007	2008
Arizona	11.3	24.0	10.7	11.2	2.5	4.8	1.7
California	0.0	0.0	0.0	0.0	0.0	0.0	
Colorado	131.1	20.0	20.0	71.4	93.7	390.2	153.4
Idaho	22.6	204.1	64.1	75.3	254.3	360.5	366.2
Montana	52.4	66.0	177.3	453.7	1,142.2	497.2	577.8
Nevada						0.7	
New Mexico	198.8	143.2	238.2	183.8	142.5	452.2	360.4
Oregon	1.9	5.5	6.6	0.3	38.0	98.1	10.0
Utah	7.0	14.7	20.0	40.5	88.6	51.4	7.7
Washington	57.5	139.9	193.2	363.1	555.7	355.8	455.1
Wyoming	134.6	13.3	4.5	6.4	4.4	29.0	34.9
Total	**617.2**	**630.7**	**734.6**	**1,205.7**	**2,321.9**	**2,239.9**	**1,967.2**

Hemlock Woolly Adelgid

Adelges tsugae Annand

The hemlock woolly adelgid is currently found in 17 Eastern States, from southern Maine to northeastern Georgia and west to eastern Kentucky and Tennessee (fig. 1). New infestations within these States continue, with some counties reporting significant increases in defoliation (fig. 2). In Pennsylvania, defoliation caused by the adelgid increased by 78 percent in 2008 compared with 2007.

Figure 1.—*Current distribution of hemlock wooly adelgid.*

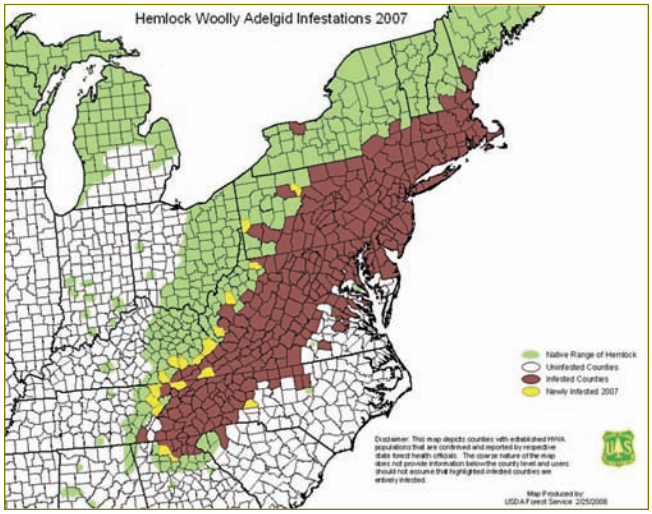


Figure 2.—*Egg masses produced by overwintering adults. Photo by Forest Service.*

Laurel Wilt Disease/Redbay Ambrosia Beetle

Raffaelea lauricols T.C. Harr., Fraedrich and Aghayeva • *Xyleborus glabratus* Eichhoff

As of 2008, nearly 45 counties in coastal Florida, Georgia, and South Carolina were infested with laurel wilt disease and redbay ambrosia beetle, causing widespread and nearly total mortality of redbay (fig. 1). Detection/evaluation surveys and research in affected areas continue (fig. 2). Florida added four new counties to the infested list in 2008: Columbia, Okeechobee, Osceola, and Volusia. Georgia added three: Clinch, Toombs, and Ware. South Carolina added one: Dorchester.

Figure 1.—*Counties where laurel wilt disease has been detected, as of 2008.*

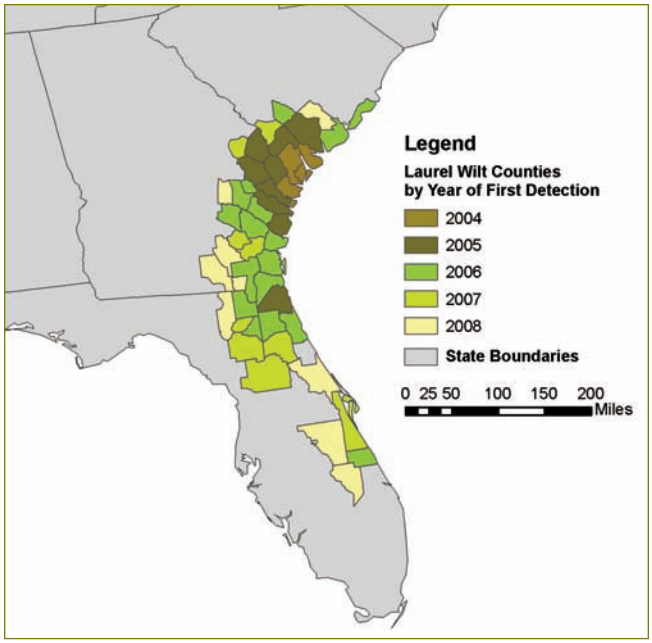


Figure 2.—*Redbay with partially wilted crown. Photo by A. Mayfield, Florida Department of Agriculture and Consumer Services, Division of Forestry.*

Spruce Budworm

Choristoneura fumiferana Clemens

In 2008, spruce budworm populations remained low in Maine, with low trap catches and no larval activity or defoliation observed. The Alaska outbreak reported around the hills of Fairbanks in 2002, and which peaked in 2004, continues to decline to preoutbreak levels (figs. 1 through 3).

Figure 1.—*Moderately defoliated white spruce in Alaska. Photo by Forest Service.*

Figure 2.—*Alaska 1:250 K quads where spruce budworm was reported, 2008.*

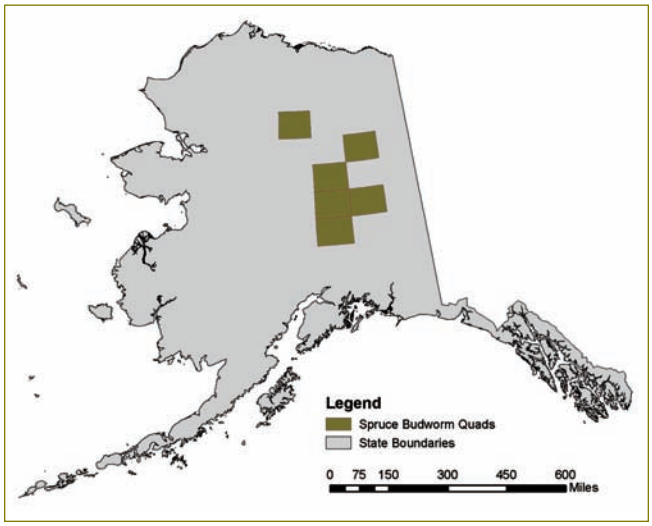
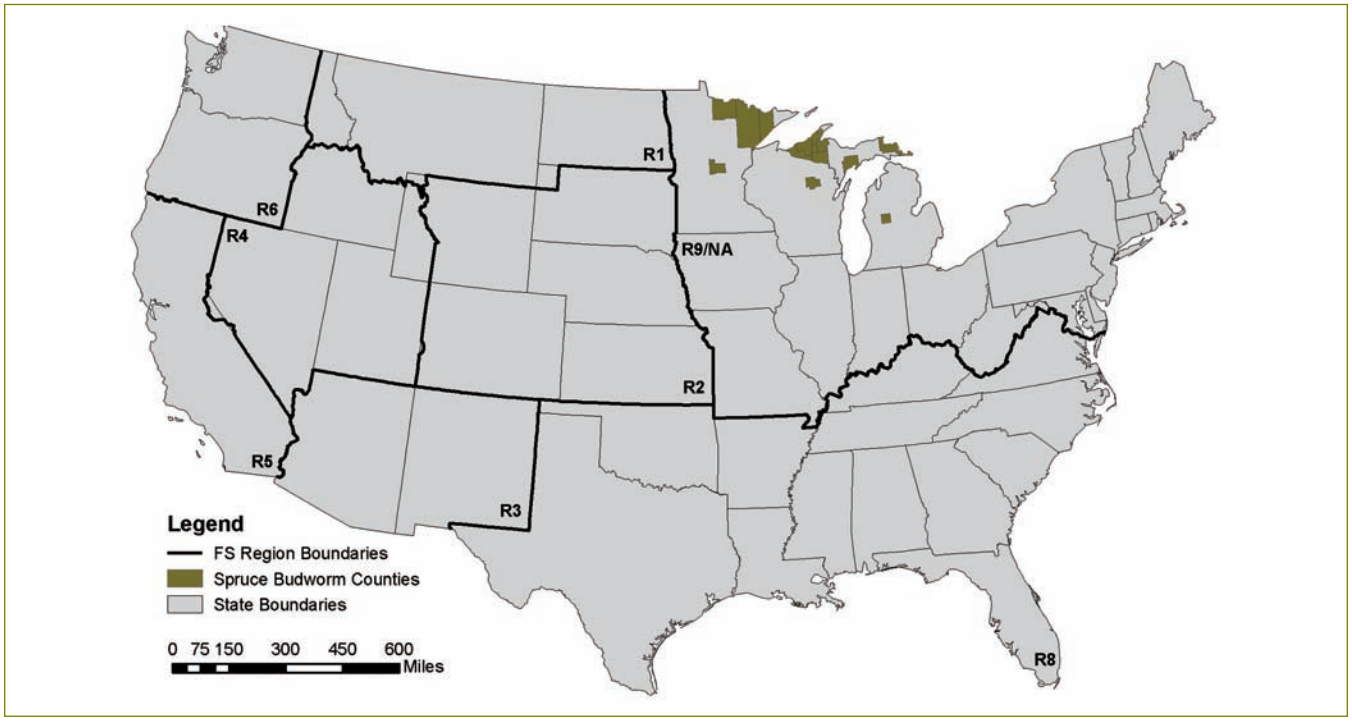


Figure 3.—*Lower 48 counties where spruce budworm was reported, 2008.*



Sirex Woodwasp

Sirex noctilio Fabricius

The sirex woodwasp (Hymenoptera: Siricidae) has been found in Michigan, New York, Pennsylvania, and Vermont. Trap surveys were conducted in these and surrounding States, including Delaware, New Jersey, Ohio, Pennsylvania, and West Virginia in 2008. Only one female sirex woodwasp was trapped in Potter County, PA (fig. 1).

Figure 1.—*Lindgren funnel trap. Photo by Pennsylvania Department of Conservation and Natural Resources.*

Dwarf Mistletoes

Arceuthobium spp.

Although this disease continues to cause tree growth loss and some mortality, no comprehensive dwarf mistletoe surveys have been conducted for more than 25 years, in part due to the slow spread of this pest. Recent analysis from Forest Inventory and Analysis (FIA) data suggests that larch dwarf mistletoe in Montana occurs at much lower levels than previously thought. In Alaska, FIA surveys indicate that approximately 12 percent of the forest land in southeast Alaska is infested with hemlock dwarf mistletoe (*A. tsugense*), equating to more than 1 million acres. In some areas, dwarf mistletoe infections are significant. On the Klamath National Forest and in El Dorado and Shasta Counties in California, lodgepole pine and red fir dwarf mistletoes were reported on the rise (fig. 1).

Figure 1.—*Western hemlock tree mortality from severe infection with hemlock dwarf mistletoe. Photo by Forest Service.*

Asian Longhorned Beetle

Anoplophora glabripennis Motschulsky

In early August 2008, the Asian longhorned beetle was detected in Massachusetts for the first time. The discovery was made by a private citizen in Worcester, in the central part of the State. A joint task force was formed consisting of personnel from the U.S. Department of Agriculture's Forest Service and Animal and Plant Health Inspection Service (APHIS), Massachusetts Department of Conservation and Recreation, Massachusetts Department of Agricultural Resources, and the city of Worcester. Surveys to delimit the infestation were conducted and, as of December 1, 2008, 4,420 infested trees had been identified and a quarantine area of 63.5 square miles established by APHIS and affected States (fig. 1).

Figure 1.—*Tree heavily infested by Asian longhorned beetle in Worcester, MA. Photo by Mike Bohne, Forest Service.*

White Pine Blister Rust

Cronartium ribicola J.C. Fisch. ex Rabenh

The pathogen continues to slowly spread to 38 States across the country, causing substantial damage and mortality to eight of the nine native white pine species. Great ecological concern remains for the high-elevation whitebark pine and bristlecone pines as the disease begins to infect those species (fig. 1).

Although the disease has generally remained static, significant cankering and mortality are occurring locally. A significant increase in damage from white pine blister rust infections was reported in Oxford County, ME, in part due to an increase in ribes populations.

Figure 1.—*Rust on limber pine. Photo by Anna Schoettle, Forest Service.*

Oak Wilt

Ceratocystis fagacearum Bretz

Oak wilt is present in the Eastern United States, and its range extends southwest into central Texas (fig. 1). The disease is prevalent in rural and urban environments but has probably caused the greatest economic damage in urban areas, where oaks are valuable and favored shade trees. Central Texas continues to experience significant cases of oak wilt. A total of 65 counties in central Texas reported the disease, with Potter County first reporting it in 2008. Missouri reported oak wilt in 6 new counties—Chariton, Cole, Ralls, St. Clair, Stone, and Taney—bringing the total to 40 counties confirmed to have the disease in the State. Oak wilt was reported for the first time in New York. The full extent of the disease in the United States is largely unknown. In many locations, oak decline has been mistaken for oak wilt and vice versa.

Figure 1.—*Oak wilt symptoms on northern red oak. Photo by Joseph O'Brien, Forest Service.*

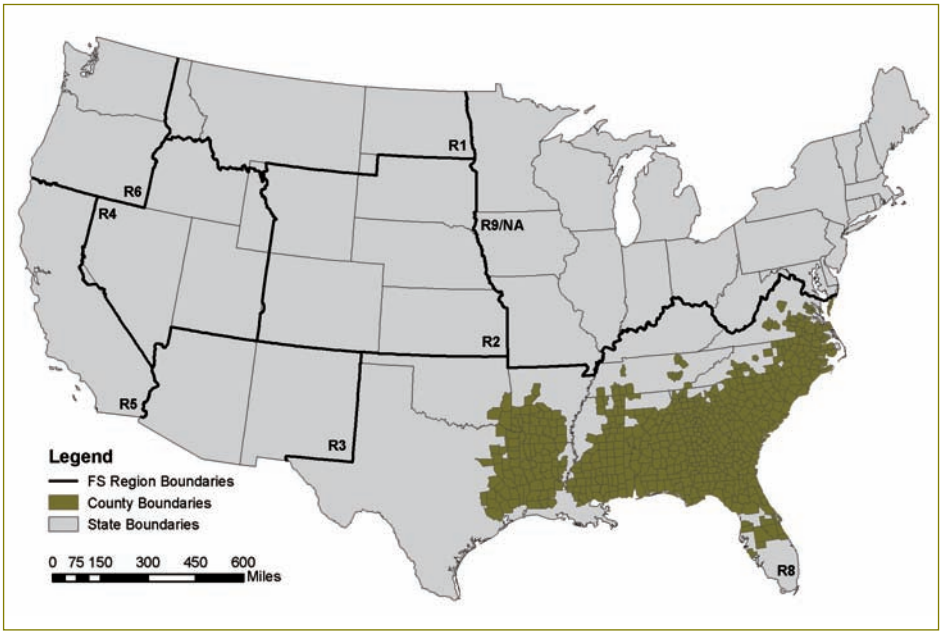
Fusiform Rust

Cronartium quercuum f. sp. *fusiforme* Hedg. and Hunt ex Cumm.

Fusiform rust (fig. 1) is sometimes a significant disease problem in loblolly and slash pine plantings across the Southern United States (fig. 2), primarily in stands less than 5 to 7 years old. Rust infection varies in severity from year to year with weather patterns and local site conditions and also with susceptibility of host genetic sources. Several instances of high rust infection have been documented recently in Florida in longleaf pine plantings, posing questions about the generally assumed resistance of longleaf pine to rust.

Figure 1.—*Fruiting bodies of* Cronartium quercuum *on loblolly pine stem. Photo by Robert L. Anderson, Forest Service.*

Figure 2.—*Counties in Southern States where more than 10 percent rust infection was reported in 2008.*



Dogwood Anthracnose

Discula destructiva Redlin

Dogwood anthracnose (fig. 1) is still present in much of the dogwood range, especially in cool, mountainous environments, although damage appears to have stabilized overall. Mortality continues at higher rates in the Piedmont and Coastal Plains of the South.

Figure 1.—*Leaf blotch symptoms. Photo by Robert L. Anderson, Forest Service.*

Beech Bark Disease

Cryptococcus fagisuga Lindinger • *Neonectria ditissima* Tul. & C. Tul. Samuels & Rossman • *N. faginata* Lohman

Beech bark disease, which extends from Maine to West Virginia and west to Ohio, with discrete outlier areas in Michigan, North Carolina, and Tennessee, continues to infect trees (fig. 1). In most States, the disease remains static, but significant decline and mortality are being experienced in localized areas. Berkshire and Franklin Counties in Massachusetts and Summit and Trumbull Counties in Ohio reported continued and moderate scale populations and mortality.

Figure 1.—*Cankered stem of beech following attack by beech scale and infection by* Neonectria *(beech bark disease complex) in Ontario. Photo by Linda Haugen, Forest Service.*

Butternut Canker

Sirococcus clavigignenti-juglandacearum Nair, V.M.G: Chuck Kostichka and J.E. Kuntz

Butternut canker is present throughout the range of butternut in North America. General observations indicate that the disease continues to cause mortality, but accurate estimates are difficult to obtain due to the scattered nature of the host, butternut (fig. 1).

Figure 1.—*Butternut* (Juglans cinerea) *trees killed by butternut canker (Wisconsin, 1975). Photo by Forest Service.*

New Pests To Watch

Phytophthora alni

Phytophthora alni subsp., *Uniformis* Brasier et al.

Due to the growing concern of a possible introduction by the pathogen *P. alni*, a disease that is known to devastate alder in Europe, surveys were conducted in Alaska in 2007 and 2008. A total of 80 sites were sampled across south-central and interior Alaska using baited traps around alder roots and soil and through water baiting using rhododendron leaves (*Azalea* spp.), bearberry leaves (*Arctostaphlos uva-ursi*), and alder twigs (*Alnus incana* subsp. *Tenuifolia*).

As of December 2008, eight isolates of *P. alni* subsp. *Uniformis* have been found across five locations in south-central and interior Alaska. All positive samples were obtained from baited soil samples. The Alaskan findings are the first to confirm this disease in North America. Many unanswered questions still remain, particularly about the origin of this organism and its ability to cause disease, but the potential for significant mortality is high. To date, there has been no field evidence that this *Phytophthora* species is causing root disease or is involved in the dieback and mortality of alder in Alaska. Monitoring and further testing for *P. alni* in Alaska will continue in the future (fig. 1).

For further information on the findings, visit the Forest Health Protection Web site in Alaska at http://www.fs.fed.us/r10/spf/fhp/phytophthora/uniformis.html.

Figure 1.—*An exposed canker caused by* Phytophthora alni *on the stem of alder. Photo by J. Juzwik, Forest Service.*

Goldspotted Oak Borer

Agrilus coxalis Waterhouse

Aerial mapping of oak mortality over the past 6 years has revealed consistent patterns of dying trees in and around the Cleveland National Forest in San Diego County, CA. About 17,000 coast live oaks (*Quercus agrifolia*), California black oaks (*Q. kelloggii*), and canyon live oaks (*Q. chrysolepis*) have died in a 1,200-km^2 area on Federal, State, tribal, and private lands. In June 2008, the goldspotted oak borer (GSOB), *Agrilus coxalis* Waterhouse, was identified as the primary cause of this oak mortality (fig. 1). The goldspotted oak borer was first collected in southern California in 2004. It has been collected previously in Guatemala and southern Mexico since the late 1880s and then later in the early 1900s in southeastern Arizona, suggesting that GSOB is native to these areas. GSOB, however, has rarely been collected in its native range (approximately 50 specimens total in North American and British museum collections) and has never been linked with injury or mortality to oak species. We hypothesize that GSOB is nonnative to California.

Symptoms of GSOB infestation can be recognized by dark-colored staining on the main stem of oaks, D-shaped adult exit holes, thinning crowns, and foraging by woodpeckers. Larval galleries of GSOB are typically black in color and have no distinctive pattern of feeding. Feeding galleries are abundant on the wood surface, patches of cambium are killed, branches die back, and eventually trees die after several years of continuous infestation. Infestation in California and Arizona appears to be limited to oaks in the red oak group of the genus (subgenus *Erythrobalanus*).

The presence of GSOB in California is a significant forest health concern because native oaks have not evolved with this type of herbivore and natural enemies for GSOB may be lacking. Both reasons may be attributing to the continuing oak mortality (fig. 2). The native distributions of the three California hosts of GSOB extend north through most of the State along the coastal foothills and along the Sierra Nevada. Future work will attempt to more clearly define the distribution of GSOB in southern California, evaluate adult emergence, and assess the impact to southern oak woodlands.

Figure 1.—*Two goldspotted oak borers.*

Figure 2.—*Oak trees infested by the goldspotted oak borer.*