



South Dakota 2012 Forest Health Highlights

South Dakota's Forest



Coniferous forests make up more than three-fourths of the state's forest. These forests are situated primarily in the Black Hills, extending north into Harding County and east to Todd County. The dominant species is ponderosa pine. These forests contribute to the state's economy through a vibrant forest products industry, tourism, and agriculture, and provide valuable wildlife habitat. Two-thirds of the coniferous forests in the state are on federal land. The most serious threats to these forests are mountain pine beetles and fires.

Bottomland forests make up only 3 percent of the forested land in the state. These forests consist primarily of cottonwood, willow, green ash, and elm. The forests provide tremendous value in improving water quality and flood control. Approximately 70 percent of bottomland forests in South Dakota are privately owned. The biggest threat to riparian forests is the lack of regeneration of cottonwood trees. Other problems include banded elm bark beetles, Dutch elm disease, and poplar cankers.



Upland hardwood forests of oak, ash, aspen and elm, comprise approximately 20 percent of South Dakota forest land and are scattered primarily in the northeast and southeast corners of the state though aspen, birch, ash, ironwood, and bur oak occur in the Black Hills. The greatest threats to these forests are declining regeneration, disease, invasive species, and land-use changes. The most valuable asset of hardwood forests are the recreational opportunities they provide. About two-thirds of the upland hardwood forests are privately owned; the rest are mostly on federal lands.

Urban or community tree lands occupy approximately 103,000 acres in the state. There is a large number of species present within community forests with ash being the most common followed by elm, crabapples, and maple. Community forests provide energy conservation, improved water quality, and aesthetic appeal, among other values. Common threats include diseases, development, and weather events. There are two Tree Campus USA universities and 34 Tree City USA communities in South Dakota.



Windbreaks cover about 200,000 acres across the state. Although not typically thought of as forest land, they serve many valuable functions. Windbreaks protect roads, fields, livestock, and structures from wind and snow, and help prevent soil erosion. They provide habitat for pheasants and other birds. Windbreaks face the same threats as other forests types. The most common species used as a shelterbelt tree is green ash, and with the looming threat of emerald ash borer, efforts are being taken to expand the diversity of plantings. There is no ownership data for windbreaks, although most are considered to be privately owned.

South Dakota Forest Insect and Disease Highlights

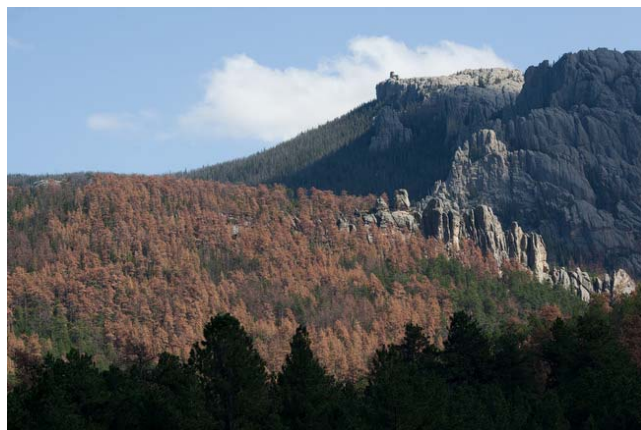
Forest Insects

Ash/lilac borer (*Podosesia syringae*). This phloem/wood-boring insect has caused loss of green ash in windbreak and urban plantings, particularly among young trees.. Tree mortality has increased in 2012 probably due to an increase in host susceptibility because of the drought.

Banded elm bark beetle (*Scolytus schevyrewi*). This bark beetle has been found in declining Siberian elms throughout the state. The infestations are particularly heavy in western South Dakota, beginning in Pierre and extending north in to Harding County and south to Fall River County. The beetle can also be found in declining Siberian elms in the eastern portion of the state but the populations do not appear as high. The insect has also been found in some declining American elms along streams and rivers in south-central South Dakota.

Cedar bark beetles (*Phloeosinus*). These bark beetles were found in the branches and trunks of declining junipers in the central part of the state, most likely because the trees were stressed by the drought.

Mountain pine beetle (*Dendroctonus ponderosae*). The Black Elk Wilderness Area bordering Custer State Park has experienced near 100 percent mortality by 2011 due to mountain pine beetle attacks. The adjacent land in Custer State Park has resulted in much lower pine mortality due to a multitude of tactics such as thinning stands to reduce susceptibility and sanitation measures including removal of infested trees to cutting the infested trees into short bolts and leaving in place. While the epidemic has been held in check in the Sylvan Lake Unit of Custer State Park, there have been a number of spot infestations that have occurred in the western portion of the main body of Custer State



Mountain pine beetle killed ponderosa pine, Black Elk Wilderness, Black Hills National Forest

Park. The mountain pine beetle epidemic in the Black Hills is still concentrated on Federal land, but has spread to private lands, primarily in the central Hills area though infestations are now becoming more common in the northern Hills as well. Landowners adjacent to Rapid City are also seeing mortality of their pines due to the beetle. The state, in cooperation with the local conservation districts, has been marking infested trees on private property at the request of landowners. There is also cost-share available to assist landowners in removal and treating the infested trees.

Limber pine is also a host to mountain pine beetle. There are some relic stands of this species in the Cathedral Spires of Custer State Park. There has been concern that the expanding beetle population from the adjacent Wilderness Area might spread into these stands and eliminate the species from the area. The trees are already stressed by white pine blister rust and encroachment by white spruce and the additional stress of beetle attacks, even unsuccessful ones, could result in significant tree mortality. Anti-aggregation pheromone, verbenone, has been used as part of the management of this relic stand of trees. The efforts have been very successful with the loss of less than 1 percent of the trees lost to colonization by mountain pine beetle, despite a high infestation of the beetles in the immediate vicinity.



Verbenone pouch on limber pine

Pine engraver beetle (*Ips*). Pine engraver beetle populations have been very low during the past several years. However, they are beginning to increase dramatically and are causing some ponderosa pine mortality in the southern and central Black Hills. Pine engraver beetles are typically found in dead and dying trees, as well as slash piles, but the populations are expanding and are now becoming a major cause of tree mortality. The population is increasing again perhaps due to the number of trees killed by the mountain pine beetle. The increase in chipping, as a means of treating pines infested with mountain pine beetle, has attracted engraver beetles to these treated stands.

Red turpentine beetle (*Dendroctonus valens*). Populations of red turpentine beetle have appeared to increase recently. The number of infested trees may not be increasing as much as being reported however, as infested trees are probably being identified more often due to the intensive inspections for mountain pine beetle. However, the increase in chipping, as a means of treating

pines infested with mountain pine beetle, is attracting turpentine beetles.

Sawyer beetles (*Monochamus*). Sawyer beetle populations have increased in the past year or two in mountain pine beetle infested trees. Previously, the sawyer beetles were not typically found in mountain pine beetle attacked trees until the following spring. Now it is common to find sawyer beetle larvae in “green” infested trees, often within weeks of the trees being colonized by mountain pine beetle.

Pine Sawflies (*Neodiprion*). There were several small pockets of sawfly defoliation in ponderosa pine stands across the southern Black Hills, though less than has been experienced during the past few years.



Pine Sawflies (*Neodiprion*)

Zimmerman pine moth (*Dioryctria*). Zimmerman pine moth continues to be a problem in windbreaks and ornamental plantings across South Dakota. Austrian pine is the primary species affected, though ponderosa pine windbreaks are also experiencing significant branch injury. The injury is also being confused with mountain pine beetle attacks on some of the infested trees in the Rapid City area.

Forest Diseases

Dutch elm disease (*Ophiostoma ulmi*). The incidence of Dutch elm disease has dramatically in-

creased in communities that still have American elms as a dominant street tree. The losses in 2012 were approximately three times the losses many communities experienced the previous year. Small communities are having increasing difficulties removing these infected trees in a timely manner and this is probably, in part, responsible for the continuing increase in tree losses to the disease.

Juniper blight is associated with three pathogens, *Cercospora sequoia* var. *juniperi*, *Kabatina juniperi* and *Phomopsis juniperovora* and these diseases can be found on both the eastern redcedar and Rocky Mountain juniper. *Cercospora* was found in several eastern redcedar windbreaks in eastern South Dakota. *Kabatina* and *phomopsis* were detected in scattered windbreaks throughout the state. *Phomopsis* was also associated with tip dieback in a number of ornamental plantings of Chinese junipers in Sioux Falls, S.D.



Juniper twig blight (*Phomopsis juniperovora*)

Pinewood nematode (*Bursaphelenchus xylophilus*). Scotch and Austrian pines in the southern part of the state, south of I-90, from Lake Andes to Hot Springs are dying from pine wilt. Sampling of pines that expressed symptoms associated with the disease have also contained populations of the pinewood nematode. The number of trees found infected with this disease has increased dramatically during the past year, perhaps related to the continuing drought and mild



Scots pine mortality due to pinewood nematode (*Bursaphelenchus xylophilus*)

winter.

Poplar cankers are associated with three pathogens *Dothichiza populea*, *Cytospora chrysosperma* and *Phomopsis macrospora*. The pathogens are common in declining cottonwoods, hybrid poplars and Lombardy poplars throughout the state. The incidence of these diseases appears to be increasing and it is most likely due to the weakened condition of the hosts from the drought.

Siberian elm canker (*Botryodiplodia hypodermia*). This disease is a common secondary stressor of Siberian elms throughout the state. The additional stresses of drought and the banded elm bark beetle has resulted in widespread mortality of this species throughout the state.

White pine blister rust (*Cronartium ribicola*). This disease is causing decline to the few relic stands of limber pine in the Cathedral Spires area of the Black Hills. Only a few of the approximately 200 trees has had the disease girdle the trunk but there has been perhaps a dozen or more trees that have branches killed by the disease. The disease is being pruned out of the trees.

Drought. Colorado spruce, cottonwood, green ash, and a number of other species were affected by drought during 2012. Much of the state began experiencing drought during late summer 2011 and the dry conditions persisted during the winter and throughout 2012. Young seedlings in wind-

break plantings were particularly impacted with losses more than 80% in some spring 2012 planting in southeastern South Dakota. Community and, urban forests were also impacted by the drought conditions. The increased environmental stress resulted in tree mortality attributed in part by colonization by borers such as ash bark beetles (*Hylesinus*), cottonwood borer (*Plectrodera scaltor*) and Zimmerman pine moth (*Dioryctria*).

Winter desiccation. The drought conditions last autumn and the warm, dry winter resulted in desiccation injury to birches and maples throughout the eastern half of the state. It is a common sight to see young (5 to 20 year old) birches and maples that had dieback to the upper half of the canopies. Some of these trees only experienced bud injury and recovered during the summer but the majority has not recovered and most tree owners have removed the trees.



South Dakota Dept. of Agriculture
Resource Conservation and Forestry Division
523 East Capitol
Pierre, SD 57501
<http://sdda.sd.gov/conservation-forestry/>
Program Administrator: Greg Josten
Greg.Josten@state.sd.us 605-394-2395
Forest Health Specialist: John Ball
John.Ball@sdstate.edu 605-688-4737
<http://sdda.sd.gov/conservation-forestry/tree-pest-alerts/>



USDA Forest Service - Rocky Mountain
Region, Forest Health Protection (FHP)
740 Simms St.
Golden, CO 80401
<http://www.fs.usda.gov/goto/r2/fh>
Forest Health Monitoring: J. L. Harris:
jharris@fs.fed.us 303-275-5155