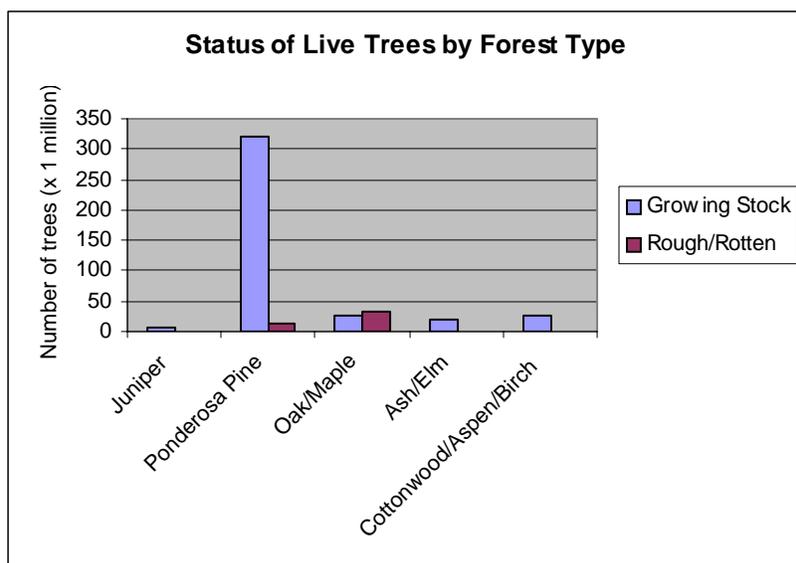


2003 Forest Health Highlights – South Dakota

The Resource

For information about Forest Types and Ownerships of forest lands in South Dakota, please see the 2002 Forest Health Highlights report on this website.

Continued data analysis of the Forest Inventory Data from South Dakota indicated some interesting observations about the “Status” of the living trees in South Dakota forest types. Status was evaluated for all living plot trees; “Growing Stock” trees were generally healthy trees with very few damages, while “Rough/Rotten” trees were often declining due to one or more major damages. Forest types of Juniper, Ash/Elm, and Cottonwood/Aspen/Birch had so few trees categorized as “Rough/Rotten” that these numbers were not indicated on the chart below. Surprisingly though, the Ponderosa Pine type should have a larger number of Rough/Rotten trees since many of the forest stands contain large outbreaks of mountain pine beetle. Also of interest was the high amount of Rough/Rotten Oak/Maple trees in the state; there were more of these oaks and maples declining than healthy and growing well.



Special Issues - Insect, disease, and drought conditions of concern in South Dakota

Mountain pine beetle, *Dendroctonus ponderosae*

Mountain pine beetle has caused intense and extensive ponderosa pine mortality throughout the Black Hills of South Dakota over the last 5 years. Results from annual aerial surveys estimate that over 1 million pines have been killed in South Dakota since 1998. The large and expanding mountain pine beetle infestation in the Beaver Park area of the northern Black Hills resulted in many stands becoming depleted of suitable host trees, while beetle populations spread to nearby areas such as Vanocker Canyon, Park Creek, and Kirk Hill. This area was the hardest hit by this beetle epidemic with more than 100,000 trees killed. Ground surveys found an overall average of 20 trees per acre killed in the Beaver Park area since 2001, nearly half being currently infested. As available host trees are killed in the Beaver Park area, then the large beetle populations expand to surrounding forest sites. The majority of the infestations were confined to national forest lands, but more private and state lands are now becoming infested.

The area around Deerfield Lake also had a large, expanding mountain pine beetle infestation. Since 2001, an average of 26 trees per acre have been killed there, with almost 70% of the trees currently infested. Additional locations where beetle populations were increasing include areas near Custer Peak, Nemo, and Bear Mountain. Continued evaluation of these outbreak areas indicates that beetle populations were still increasing and will cause dramatic levels of future tree mortality.

As available host trees were killed in these areas, the large beetle populations expanded to surrounding forest stands. The majority of the infestations were confined to National Forest Lands, but more private lands were becoming infested as the epidemic expands. Forest Landowners are being encouraged to thin their forests to reduce stand susceptibility.

Aerial survey estimates indicated that 189,700 acres in South Dakota contained more than 270,000 trees killed by mountain pine beetle.

Pine engraver beetle, *Ips* spp.

Ips pini, caused significant amounts of ponderosa pine mortality in the Black Hills and the Pine Ridge Indian Reservation of South Dakota. Pine engraver beetles are typically found in dead and dying trees, as well as slash piles, but the populations were expanding and becoming a major cause of tree mortality. The population increased exponentially around the Black Hills the last four years. This recent, unprecedented level of pine engraver beetle activity is a consequence of wildfires, mountain pine beetle and weather events; weather damages by hail and snow-breakage resulted in a tremendous build up of dead, weakened, damaged tree material. With a nearly unlimited supply of food, the beetle populations increased significantly. Now that this food supply is becoming less suitable, pine engraver beetles are attracted to healthy trees and are causing significant tree mortality. Many of the areas getting hit hardest by *Ips* in the Black Hills were in the wildland-urban interface. More than 120,700 thousand ponderosa pines in 45,200 acres died from pine engraver beetles.

The state conducted several baiting programs to monitor and manage pine engraver populations. Two of the major mills in the state placed lures around their log piles to trap beetles emerging from infested logs. A golf course experiencing a high population of engraver beetles, and subsequent tree mortality, reduced the beetle populations dramatically by removal of infested trees, slash disposal and mass trapping.

Zimmerman pine tip moth, *Dioryctria* spp.

Austrian pine, ponderosa pine, Scotch pine, Colorado blue spruce
Zimmerman pine tip moth infestations were increasing across the state. Austrian and ponderosa pines were the two tree species most affected. Many Austrian pine windbreaks in the southeastern part of the state showed almost 100 percent of the trees infested. In addition, a number of blue spruce became infested with a *Dioryctria* insect.

Pine wilt and Pinewood nematode, *Bursaphelenchus xylophilus*

Austrian pine, ponderosa pine, Scotch pine
Numerous Scotch and Austrian pines in the southern portion of South Dakota were showing symptoms of rapid needle discoloration and decline. These symptoms are often associated with pine wilt and pinewood nematode. A survey during 2002 and 2003 found that dying Scotch pines and Austrian pines in the southwestern portion of the state were infested with the nematode. In 2003, approximately 20 acres of trees in several windbreaks and communities were identified as having died from this disease.

Sphaeropsis blight (Diplodia blight), *Sphaeropsis sapinea*

Ponderosa pine, Austrian pine, Scotch pine
In 2003, trees on 300 acres of forest, urban and agro-forestry lands had serious infections of Diplodia tip blight. The disease was common throughout Nebraska and South Dakota, particularly on Austrian pine; there was an increase in the incidence of the disease in the Black Hills due to spring hailstorms. The disease continued to be a serious problem in pine windbreaks and landscape plantings in eastern Nebraska.

Dutch elm disease, *Ophiostoma novo-ulmi*

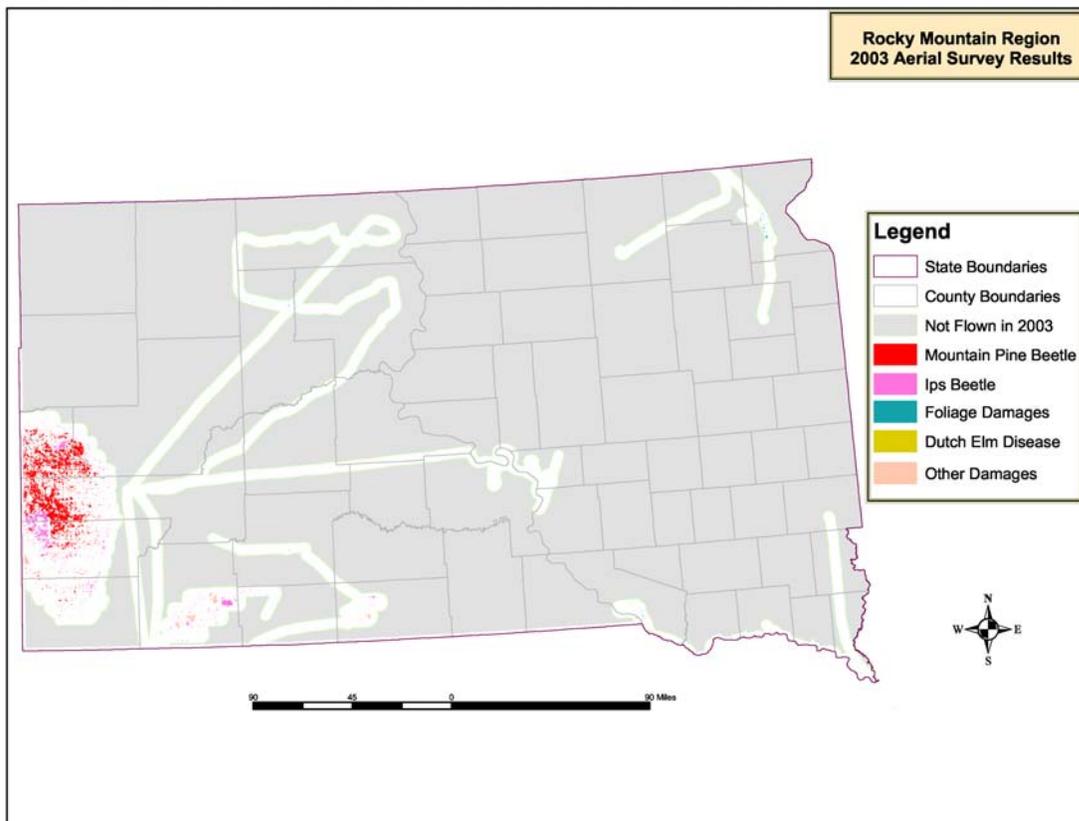
In 2003, the incidence of Dutch elm disease increased in several South Dakota communities that still have American elms as a dominant street tree. Losses were not as high an increase as the previous two years, but still above that experienced in the mid-1990s with some communities experiencing losses higher than four or five percent. This increase may be due to the inability of communities to conduct prompt removals of the infected trees.

Drought

Colorado spruce, cottonwood, green ash, and a number of other species were affected by drought in 2003. While some of the western portions of South Dakota began experiencing drought in 2001, this condition became statewide by 2003. In addition to agro-forestry plantings, urban forests were also impacted by drought conditions. The increased environmental stress resulted in tree mortality attributed in part by colonization of borers such as ash bark beetles (*Hylesinus spp*), cottonwood borer (*Plectrodera scalator*) and Zimmerman pine moth (*Dioryctria spp*).

2003 Aerial Survey of South Dakota

Much of the Black Hills forests, the Pine Ridge Indian Reservation, and several riparian areas in South Dakota were flown in 2003. Below are a map of the areas flown and a table of the main damaging agents.



Damage Agent	Number of Trees Damaged (x 1000)	Number of Acres Affected (x 1000)
Mountain Pine Beetle	270.2	189.7
Pine Engraver Beetle	120.7	45.2
Foliage Damage	---	0.2
Dutch Elm Disease	---	0.2
Other Damages	---	2.0

Forest Health Information and Assistance in South Dakota

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