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Testimony

Forest Health Conditions and Forest Management Practices on the Black Hills National
Forest

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The Black Hills are a unique feature of South Dakota and state residents are justifiably proud of their prairie gem. It is the forested island in a sea of grass and contains more than 1000 different plants representing species common to both the eastern and western forests. It is a special place to South Dakotans.

There is also a concern expressed by some that we are losing that special part of the Black Hills; that the forest has been altered to the point it would be unrecognized by someone from a century ago. Some speak of a vast forest, certainly much larger than today's; that was covered with majestic pines thousands of years old and four feet or more in diameter.

But was this the condition of the forest? Has forest management changing the forest beyond recognition to a visitor from the 19th century? Are the trees becoming fewer in number and smaller in size? Regardless of your opinion on how the Black Hills should be managed; these are good questions to ask. Understanding the structure and composition of the past Black Hills forest can help us better manage the present and plan for the future. So how did the Black Hills appear during the 19th century? Communities were platted in the late 1870s and early 1880s and this marked the beginning of the commercial development of the Black Hills. But there were earlier expeditions that provided us with first-hand accounts of the forest before the timber harvests that built the mines and towns.

Obviously the Cheyenne, Lakota and others lived in this region far longer. Oral histories can be surprisingly accurate and I mean no disrespect by not including their history regarding the Black Hills. I used the records of early government expeditions for one reason; they used terms and measurements that are familiar to all and not open to much interpretation. They measured tree diameters in inches and height in feet. Trees were tallied by the acre.

So what did they see? Walter Jenney was on the 1875 expedition to the Black Hills, only a year after Custer's. His duties included surveying the natural resources, grazing, mineral and timber. It was not a vast, closed-canopy forest that Jenney saw, but scattered forests. Jenney noted, "Taking into consideration that the foothills are but sparsely wooded; that there are extensive parks and valley in the interior destitute of trees, or where there are scattered groves of pine; that over an aggregate are several hundred square miles the timber has been destroyed by fire, I estimate that *one-half* (Jenney's italics) the surface included within the timber line is covered by forests of more or less mature growth."

The mature growths mentioned by Jenney were not trees four or more feet in diameter. He wrote, "On the bottom-lands in the lower valley of French Creek specimens of this pine were seen that were fully 100 feet in height, and would measure 35 to 40 inches through at the ground. Trees of these large dimensions are, however, rare in the Hills. Timber of from 12 to 24 inch is common, while extensive tracts are covered by a dense forest of small slender pines from 50 to 60 feet high and rarely less than 8 or more than 12 inches through at the ground." The number and size of these trees did not overly impress the explorers (though the spectacular scenery did). Another expedition member, Richard Dodge, wrote, "...it [the Black Hills] will not furnish any very large quantity [of timber] for exportation."

The Black Hills were described as a paradise but a “stockman’s paradise.” James Calhoun, a first lieutenant with Custer during the 1874 expedition noted; “fine open country covered with excellent grazing.” He went on to describe, “The open and timbered spaces are so divided that a partly prepared farm of almost any dimension, from one acre upward, can be found here.”

What kept the forest so open? Fire and beetles. A July 17, 1874 diary entry by Calhoun mentions, “two extensive fires from the direction of the Black Hills, at midnight the very heavens seem on fire.” Jenney described the scenery around the center portion of the Black Hills as “...scarcely a living tree is to be seen for miles. The timber, deadened by fire and the trees left standing, their decaying trunks stripped of bark by weather or prostrated by the wind, cover the ground, crossing each other at all angles, forming an impassable barrier.” Fires are a common disturbance throughout the western coniferous forests of North America and have occurred in the Black Hill for centuries. The large fires of recent years such as the 2000 Jasper fire have certainly focused attention on the power of this disturbance and later fires such as the Grizzly Gulch has made people aware of the potential threat these fires can be to homes and communities.

The other prominent natural disturbance agent in the Black Hills is the mountain pine beetle. Hopkins in 1902 reported the “Black Hills beetle [mountain pine beetle] has killed most of the trees from Deadwood to the Wyoming border.” The mountain pine beetle, as with wildfires, has been in the news during the past several years. Presently 200,000 acres of the Black Hills National Forest has been affected by bark beetles, about one-sixth of the Forest. In addition to the mountain pine beetle, a closely related species, the pine engraver beetle, often referred to as simply *Ips*, is at unprecedented high levels. Bark beetles epidemics are not new phenomena to the Black Hills, or any coniferous forest in western North America. There is evidence that these epidemics have occurred periodically during the past thousand years and probably as long as there has been beetles and pines. The largest recorded epidemic of mountain pine beetle occurred in the late 1890s, and in the Black Hills, where an estimated 10 million trees were killed. During the past century another four have appeared, each lasting approximately six to 13 years, and we are now in the midst of a fifth. The current outbreak, which began in the late 1990s, has already resulted in the loss of more than 1.5 million trees and shows no sign of ending. The concern is just not with the loss of trees but the potential fire risk that these dead trees present. Once the dead infested trees dry and fall they provide a fuel source for wildfires.

Bark beetles prefer large diameter trees – those more than 7 inches at 4.5 feet above the ground and high density stands, those more than 120 square feet basal area per acre. These dense stands provide the environmental conditions that allow the bark beetles to expand. There are more than 400,000 acres of dense forest that is susceptible to mountain pine beetle and wildfires. The means to reduce the threat to bark beetle epidemics are the same as for fire, thinning the forest.

The ponderosa pine forest reproduction is prolific in the Black Hills. Planting after timber harvest is not necessary as the seeds come in very quickly. Ponderosa pine stands quickly grow and dense, overstocked stands become the result. Currently the forest is growing biomass faster than mortality and harvest can remove it. If this situation persists, the risk of mountain pine beetle attack and wildfires will also remain high. There are three means of reducing the density of the forest, fire, bark beetles and logging.

While each can reduce stand density, they differ in fundamentally important ways. Fire can thin, and in some instances eliminate, a forest stand. Bark beetles can do the same. Only timber harvest can be regulated to a finer degree to reduce stand densities to a target level and not beyond. Forest management decisions are often implemented by harvesting trees.

We are fortunate in the Black Hills to still have a viable timber industry. In many areas of the West it is difficult to find someone to physically do the work of forest management, their forest product industry having dwindled and disappeared during the 1990s as reduced harvests from National Forests resulted in volumes too low to sustain an industry. The Black Hills National Forest has also experienced a significant reduction in harvest, and the local forest product industry has shrunk, but survived by making up the National Forest volume with that from private lands within the Black Hills and the surrounding states. However these stands are limited and without an increase in harvest from the Black Hills National Forest, we will lose a significant portion of the state's forest products industry and with that the tools to implement forest management decisions. I might add too that while we referred to it as the forest product industry, it has a human face. Logging is more related to family farms than most people realize. Loggers work for themselves or small companies. The average logger in the Black Hills has logged more than 15 years, is a second or third generation logger who depends upon logging to provide more than 90 percent of their income. The loss of this skilled workforce will limit the management options available to create and sustain a healthy forest.

The Black Hills National Forest was converted from primarily an old-growth forest in the late 1800s. Almost every acre of the Black Hills has been cut at least once during the past 125 years. The 5th billion board foot of timber was harvested in 1997. The current estimate is there is approximately 5 billion board feet on the forest; in 1899 there was an estimated 1.5 billion. There has been a substantial increase.

So what other changes would someone from the 1800s notice? There are more trees, not fewer, though not all species have expanded their numbers equally. Fire suppression efforts during the 1900s have allowed fire-sensitive species such as Black Hills spruce, to increase in numbers. Other species, such as aspen and birch, that depend in part for fires to reduce competition, have become less numerous. Ponderosa pine was and still is the dominant tree species though early logging and fire has altered the number and sizes.

Ecosystems are complicated and their health is measured by far more than tree numbers and sizes. I limited this viewpoint to these parameters to make this final point. There are many critical issues surrounding the management of the Black Hills' resources, from fire policies to urban sprawl, and all benefit from involved public discussion. Facts, rather than myths, however, are the best foundation for our arguments.