

breaking up after 100-120 years. We compared attributes of stands with mortality and those without, and found no trends in site index or stand age. Any trends may be obscured by the fact that aspen stands usually start life with thousands of suckers, but as they mature mortality occurs constantly to reduce stand density to several hundred stems. Many of these stands are approaching the limits of stand density index maximum (SDI<sub>max</sub>), so mortality must occur if the stand is to continue to grow.

Similar to findings in pinyon pine, at specified latitudes, the average elevation of aspen plots with mortality was found to be several hundred feet lower than the average elevation of aspen plots without mortality. Pinyon pine, ponderosa pine, Engelmann spruce, and aspen are all experiencing mortality rates greater than the average from 1980-2000. However, since 1991, aspen mortality has exceeded the 20 year average only 6 times. We believe that this mortality is consistent with the effects of prolonged drought.

[\\*fred.baker@usu.edu](mailto:fred.baker@usu.edu)

### **Aspen forest health survey in Wyoming**

\*James T. Blodgett, Rocky Mountain Region, Forest Health Management, Rapid City, SD  
John E. Lundquist, Alaska Region, Forest Health Protection, Anchorage, AK

This study documents common diseases, insects, and damage agents associated with aspen stress and mortality in Wyoming. Observations were made from 2003 to 2006. Surveyed stands were systematically selected using a 3-mile grid, ownership, vegetation type, and accessibility layers in a geographic information system. The survey included state, federal, and tribal lands. Based on a recent state-level vegetation classification (Wyoming GAP data), all major forest cover types found in Wyoming were included. For each causal agent, significant impacts were recorded as present or absent. Significant impact was defined as “stressed” if > 25% of the trees had > 1/3 of the stem or crown affected and “mortality” if > 5% of the trees had recently died based on visual inspection. Thirty of the 300 stands surveyed were classified as aspen cover type. Results indicate that the most common causal agents of stress and mortality among aspen were cankers 67% (mainly *Cytospora chrysosperma*, *Encomia pruinosa*, and *Cryptosphaeria lignyota*), Ganoderma root disease 47% (*Ganoderma applanatum*), Armillaria root disease 13% (*Armillaria* spp.), animal damaged 10%, foliage rust 3% (*Melampsora* spp.), and poplar borer 3% (*Saperda calcarata*). The *Armillaria* fungus was detected in 27% of the stands, but was only confirmed to be causing root disease in 13% of the stands. Stands and trees were usually affected by multiple causal agents; root diseases and cankers often occurred in the same stand. The root pathogens, *G. applanatum* and *Armillaria* spp., and the canker pathogens, *C. chrysosperma*, *E. pruinosa*, and *C. lignyota*, are responsible for much of the observed aspen mortality in Wyoming. The widespread synchronized occurrence of these pathogens suggests at least one broad-scale predisposing factor. These results warrant more detailed studies of aspen using a denser sampling design.

[\\*jblodgett@fs.fed.us](mailto:jblodgett@fs.fed.us)