

2017 Wyoming Forest Health Highlights



Figure 1. Photo of High elevation forests and lakes of the Wind River Range in western Wyoming. Photo: Ryan DeSantis 2017

Wyoming has a land area of over 62.6 million acres, and elevations range from a low of 3,099 feet on the Belle Fourche River in Crook County in the northeastern corner of the state, to 13,804 feet on Gannett Peak in Fremont County. Approximately 19 percent of Wyoming, or about 11.8 million acres, is forested. Wyoming's forests provide clean water and air, wood products, habitat for wildlife and other biota, forage for livestock, the foundation of a profitable travel and tourism economy, and places for recreation and spiritual reflection.

Wyoming's forests are facing significant challenges. Bark beetle infestations, drought, highly destructive wildfires, introduction of invasive non-native species, and increased residential development are happening at a level not seen in recent history. Such challenges may inhibit the ability of our forests to provide the full range of multiple uses and values people enjoy and rely on.

Most of Wyoming’s forests are located at higher elevations on federal land. Lodgepole pine is the most dominant forest type, followed in order of prevalence by spruce-fir, ponderosa pine, Douglas-fir, juniper, aspen, whitebark pine, and limber pine. More than half of Wyoming’s forest land is administered by the U.S. Forest Service, 17 percent is privately-owned (including Indian Trust Land), 15 percent is administered by the National Park Service, 11 percent is administered by the Bureau of Land Management, and 4 percent is owned by state, county, and various other federal agencies.

(Excerpt from Governor’s Task Force Final Report, January, 2015)

Mountain pine beetle (MPB) activity declined from 34,000 acres in 2015 to 6,300 acres in 2016 to 3,300 acres in 2017. The most recent epidemic has ended across Wyoming.

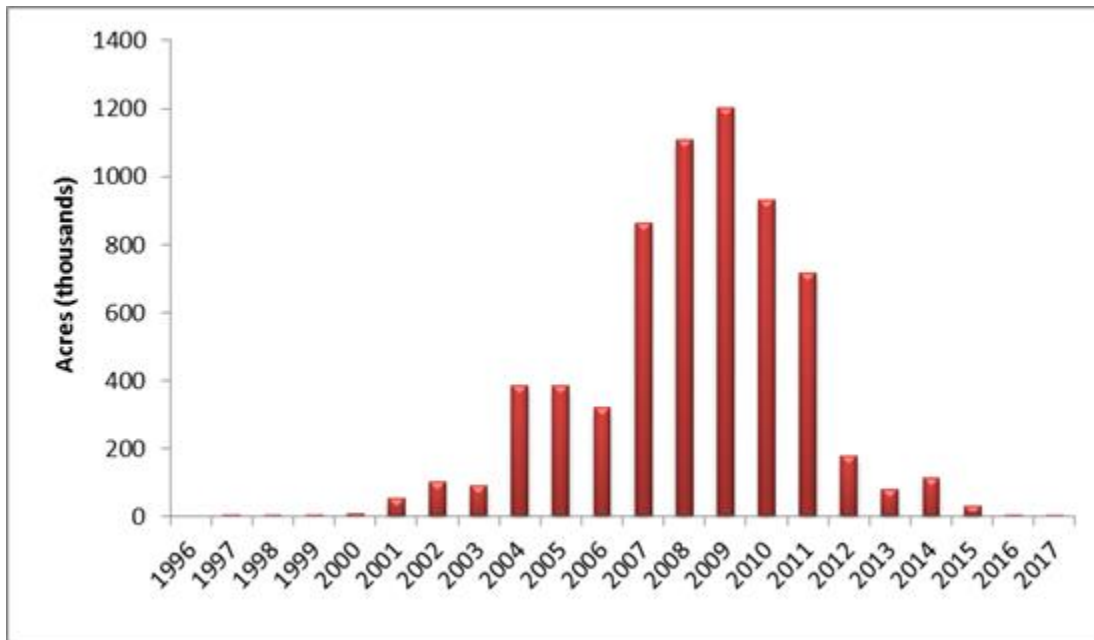


Figure 2. Annual acres of observed mountain pine beetle activity in Wyoming. Not all areas are surveyed every year. Figure courtesy U.S. Forest Service

The majority of MPB activity occurred in Crook and Weston counties. 1,800 acres were affected by MPB and ips engraver beetles. However, Black Hills brood surveys indicate low MPB activity and the end of the most recent epidemic, with populations returning to endemic levels. This area was recently monitored by finer-scale aerial photo interpretation in cooperation with Wyoming State Forestry Division and neighboring forestry agencies and industries in South Dakota. Beginning in 2017, this area returned to aerial surveying rather than aerial photo interpretation. Forests were examined by Wyoming State Forestry Division to detect MPB activity. There has been a noticeable decline of MPB observed over the past few years. Infrequent single-tree hits were remotely scattered and no large mortality pockets or beetle outbreaks were observed (Figure 3).



Figure 3. Pockets of mountain pine beetle and ips engraver beetle caused mortality in northeastern Wyoming. Photo: Justin Backsen 2017

The majority of the approximately 1,000 acres in western Wyoming affected by MPB were areas where MPB affects high elevation five needle pines. In many areas, most of the mature five needle pines have been killed (Figure 4).

The picture above shows high elevation whitebark pine killed by mountain pine beetle in Absaroka Range, northwestern Wyoming

The white bushy trees near the center and bottom of this photo are whitebark pine trees denuded of foliage following mountain pine beetle-caused mortality.

Many of the areas east of the Continental Divide located outside of National Forest lands are either recovering from past bark beetle activity or were not attacked by MPB.



Figure 4. High elevation whitebark pine killed by mountain pine beetle in the Absaroka Range of northwestern Wyoming. White bushy trees near center and bottom of photo are whitebark pines denuded of foliage following MPB-caused mortality. Photo: Ryan DeSantis 2017

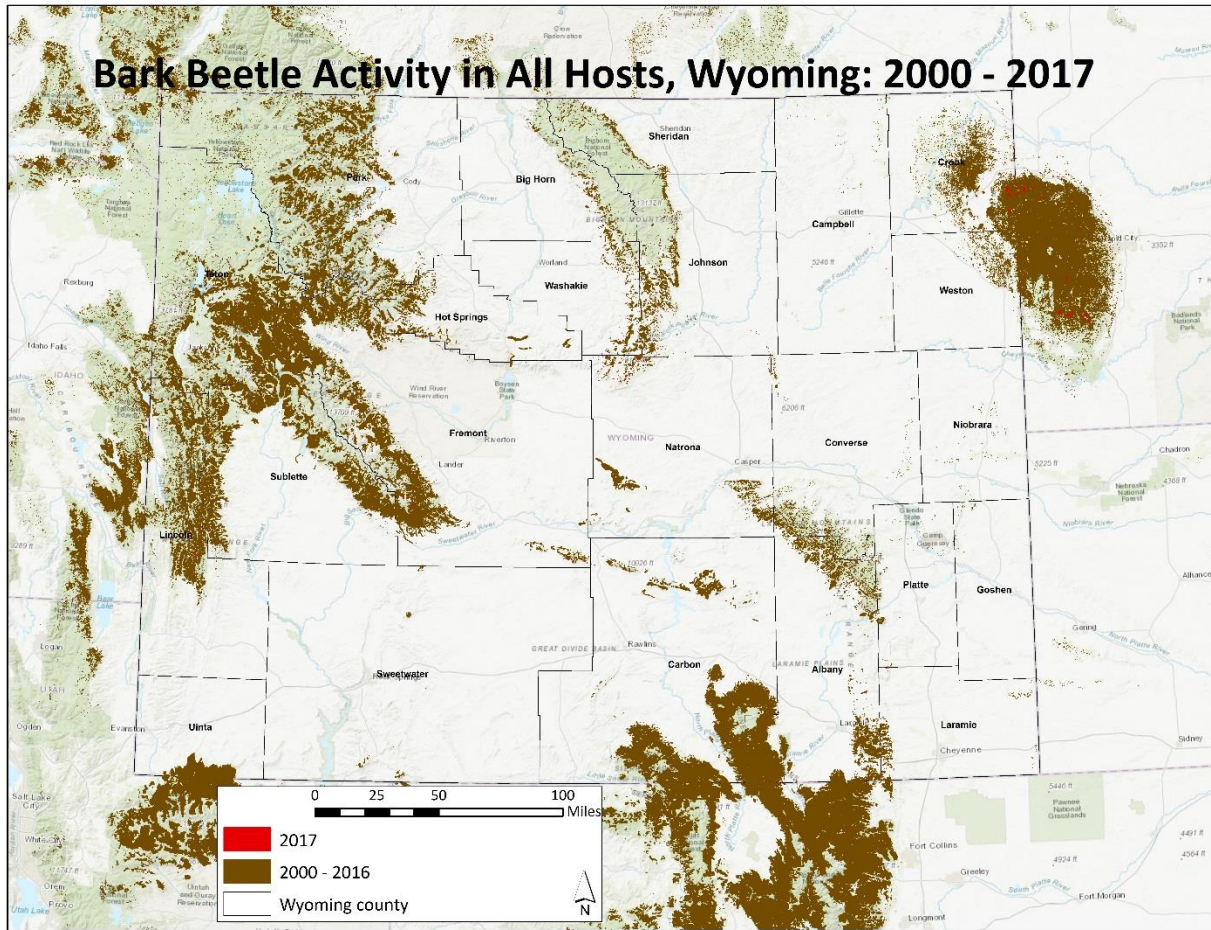


Figure 5. Map of Bark beetle activity in all conifer host trees in Wyoming. While most affected areas in western Wyoming shown here depict mountain pine beetle damage, northeastern Wyoming has had substantial engraver beetle activity. Not all areas are surveyed every year. Due to the nature of aerial surveys, this data will only provide rough estimates of location, intensity and the resulting trend information for agents detectable from the air. Many of the most destructive diseases are not represented in the data because these agents are not detectable from aerial surveys. The data presented should only be used as a partial indicator of insect and disease activity, and should be validated on the ground for actual location and causal agent. The insect and disease data is available digitally from the U.S. Forest Service, Region Two Forest Health Management group. The cooperators reserve the right to correct, update, modify or replace GIS products. Using this data for purposes other than those for which it was intended may yield inaccurate or misleading results. Map courtesy U.S. Forest Service & Wyoming State Forestry Division

In southern and southeastern Wyoming, including the Medicine Bow National Forest and adjacent lands in Carbon, Albany, Laramie, Platte, Converse and Natrona counties, approximately 400 acres of limber pine were affected by MPB in 2017. No new MPB activity was observed in lodgepole or ponderosa pines, but dead standing trees are common, as indicated by brown polygons in Figure 5.



Figure 6. In this aerial photo, mountain pine beetle (MPB)-killed lodgepole pine in the Medicine Bow National Forest appears as gray shapes amongst the darker green of young lodgepole pine regeneration and the pale yellow of recent harvests. Smoke from the 2016 Beaver Creek Fire, which burned in areas of dead standing MPB-killed lodgepole pine, is visible near top-left. Photo: Ryan DeSantis 2016

Spruce beetle activity declined from 68,000 acres in 2015 to 34,000 acres in 2016 to 28,000 acres in 2017.

The vast majority of spruce beetle activity was confined to western Wyoming (Figure 8).

The chart below shows the annual acres of observed spruce beetle activity in Wyoming from 1996 to 2017. Unlike mountain pine beetle activity which peaked in 2009, spruce beetle activity has been up and down. Not all areas are surveyed every year.

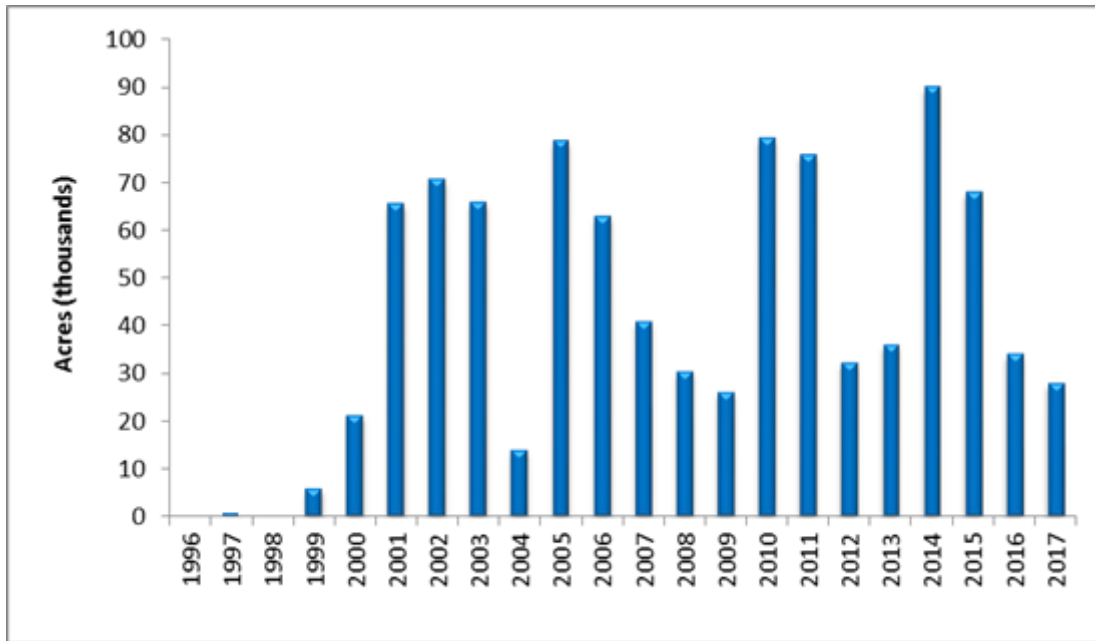


Figure 7. Annual acres of observed spruce beetle activity in Wyoming. Not all areas are surveyed every year. Figure courtesy U.S. Forest Service

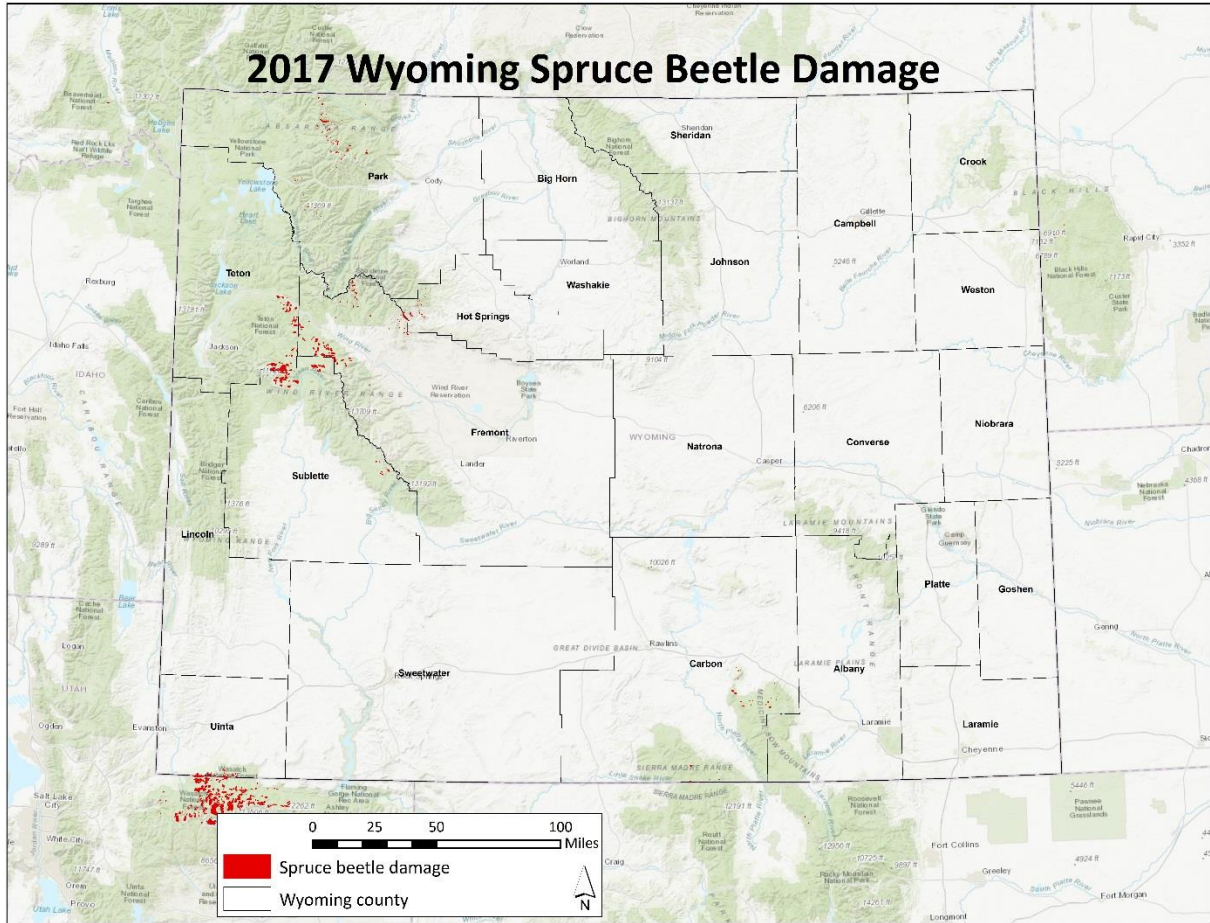


Figure 8. Spruce beetle activity in Wyoming. Due to the nature of aerial surveys, this data will only provide rough estimates of location, intensity and the resulting trend information for agents detectable from the air. Many of the most destructive diseases are not represented in the data because these agents are not detectable from aerial surveys. The data presented should only be used as a partial indicator of insect and disease activity, and should be validated on the ground for actual location and causal agent. The insect and disease data is available digitally from the U.S. Forest Service, Region Two Forest Health Management group. The cooperators reserve the right to correct, update, modify or replace GIS products. Using this data for purposes other than those for which it was intended may yield inaccurate or misleading results. Map courtesy U.S. Forest Service & Wyoming State Forestry Division

Western Wyoming spruce mortality caused by spruce beetle was identified on 27,000 acres previously uninfested by spruce beetle. Since 1996, over 700,000 acres have been affected by spruce beetle in Wyoming, leaving many dead standing spruce trees in higher elevations (Figure 9).



Figure 9. Dead standing spruce on the Shoshone National Forest in western Wyoming. Photo: Ryan DeSantis 2017

Douglas-fir beetle mortality has been detected on over 430,000 acres across Wyoming since the early 2000s. Recently it has returned to endemic levels. Only 230 acres were affected by Douglas-fir beetle in 2017.



Figure 10. Douglas-fir trees killed in the early 2000s by Douglas-fir beetle are falling in impacted areas most notably on the Bighorn and Shoshone National Forests. Photo: Kurt Allen 2017

Subalpine fir decline can be found throughout Wyoming's high elevation forests, although mortality of subalpine fir is often less intense than in associated spruce. Mortality often becomes more noticeable after successive years. In 2017, 15,000 acres of Wyoming's forests had varying levels of subalpine fir killed by western balsam bark beetle and fungi associated with subalpine fir decline.



Figure 11. Subalpine fir mortality is often detected at low levels across large areas. Photo: Kendra Schotzko 2016



Figure 12. Over time, low levels of subalpine fir mortality can accumulate into more significant levels of overstory mortality. Photo: Kurt Allen 2017

Western spruce budworm defoliation of Douglas-fir and Engelmann spruce was detected on over 68,000 acres in 2017, with large budworm-caused mortality polygons mapped primarily in western Wyoming. Western spruce budworm larvae feed on Douglas-fir, Engelmann spruce, and subalpine fir foliage in the spring. Larval feeding can decrease growth, kill the tops of trees, or kill trees outright if heavy defoliation occurs across multiple years. Defoliation of large areas can lead to a brownish cast to the forest.



Figure 13. Discolored Douglas-fir from western spruce budworm feeding on the Shoshone National Forest. Photo: Kurt Allen 2017



Figure 14. Heavy western spruce budworm caused defoliation in the Clarks Fork area on the Shoshone National Forest. Photo: Kurt Allen 2017

Many other insects and diseases that affect Wyoming’s forests are not visible during aerial surveys. White pine blister rust and dwarf mistletoes have substantial ecological and forest management impacts statewide.

White pine blister rust is a non-native disease affecting limber and whitebark pines across Wyoming (Figure 15). Recently, white pine blister rust detection has increased in Bridger-Teton National Forest recreation areas in western Wyoming. This part of Wyoming is notorious for periodic years of high white pine blister rust activity. Affected pines often occur at high elevation and are important to many wildlife species. The disease infects the needles and grows into the stem, forming cankers that eventually girdle branches or the main stem of the tree (Figure 16). Main stem cankers can be lethal to young trees which are especially important considering many mature whitebark and limber pines have been killed by mountain pine beetle epidemics and white pine blister rust. Naturally occurring genetic resistance to the disease has been identified. Genetic resistance is important for the future of these ecologically important Wyoming trees.

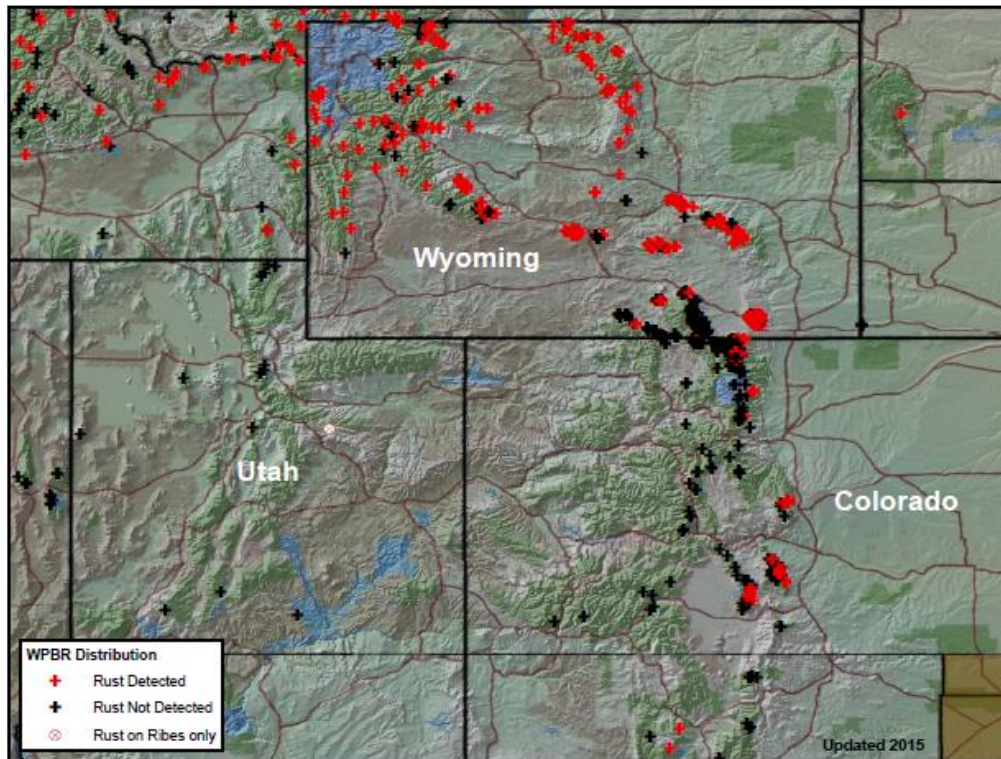


Figure 15. White pine blister rust distribution across Wyoming and neighboring states. Map courtesy U.S. Forest Service



Figure 16. White pine blister rust damage on limber pine at Vedauwoo Recreation Area, Medicine Bow National Forest. Photo: Kelly Burns 2016

Dwarf mistletoes are several species of native parasitic plants locally common in Wyoming's forests (Figure 17). The plants can slow growth, deform, and eventually kill pines and Douglas-firs in Wyoming. They are persistent and they spread slowly within and adjacent to trees by exploding berries that shoot sticky seeds. Impacts can be severe on young trees growing adjacent to infected trees (Figure 18). Clearcutting is an especially effective treatment for lodgepole pine, which regenerates well after disturbance (Figure 19).



Figure 17. Dwarf mistletoe plants on lodgepole pine. Photo: Kelly Burns 2017



Figure 18. Heavily dwarf mistletoe infected young lodgepole pine. Photo: Kelly Burns 2017



Figure 19. Dwarf mistletoe management on the Bighorn National Forest. Photo: Bob Cain 2016

Monitoring for non-native invasive insects continues. Balsam woolly adelgid has caused substantial subalpine fir mortality in the northwestern U.S. It has been positively identified nearby in northern Utah and southeastern Idaho, but not yet in Wyoming. No damage caused by gypsy moth was observed during the annual detection survey, although gypsy moths were found in traps in Lovell in 2015 and Casper in 2016. Subsequent delimiting trapping in Lovell and Casper did not detect any additional moths. Wyoming State Forestry Division assists USDA-

APHIS PPQ with gypsy moth trapping efforts. Emerald ash borer (EAB) has not been detected in Wyoming but USDA APHIS-PPQ and Wyoming State Forestry Division continue collaborating on EAB planning. This is critical considering there is an established EAB population in Boulder County, Colorado, which is 60 miles south of Wyoming's border. There are also established EAB populations in eastern Nebraska. EAB could inadvertently be transported to suitable ash tree hosts in Wyoming in infested firewood, lumber, or other wood products, so Wyoming State Forestry Division continues educational efforts to reduce the potential for accidental introduction of EAB to Wyoming. In 2017, additional educational efforts included a Don't Move Firewood billboard campaign focused on the August total solar eclipse event which is estimated to have brought an additional 261,000 visitors into the state of Wyoming solely for the event.

Wyoming State Forestry Division is committed to providing professional forestry service, information, and education to the citizens of Wyoming to achieve resilient forests and communities. In 2017, Wyoming State Forestry Division treated more than 6,000 acres in Wyoming, predominantly on private and state lands, as part of forest management, forest health and wildfire mitigation efforts.

For more information or for assistance, please contact:



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