

Montana Forest Health Highlights 2017

Produced by the Forest Pest Management Program of
the Montana Department of Natural Resources and Conservation (DNRC)



Heterobasidion root disease fruiting structure.

Root Disease Hazard Map Updates

Root disease is consistently the most damaging disease in western Montana, with estimates of more than 5 million acres impacted. Root disease fungi are long-lived and reside in standing trees and old stumps. Spread via root contacts from infested to healthy trees allows isolated root disease pockets to steadily expand into large tracts of forest. A collaborative project between the USDA Forest Service, University of Montana, and Montana Department of Natural Resources and Conservation is employing fine resolution climate and topography data to create maps where habitat is suitable for root disease fungi. Further additions of tree species layers and root disease detections from Forest Inventory & Analysis (FIA) plots will expand maps to predict potential timber losses.



Root disease in Douglas-fir.

Heterobasidion Root Disease Surveys on State Land

Heterobasidion root disease is caused by two separate species of the Heterobasidion fungus, one of which infects pine. Freshly-cut pine stumps serve as a suitable substrate for the spore development. The infection spreads into the root system of the stump and then moves into adjacent healthy trees through underground root grafting. To reduce spore colonization, stump surfaces are treated with borate-based salt compounds immediately following harvest. This treatment can be labor intensive and costly, leading to overall reductions in timber profit. Surveys are being conducted on State Lands to determine occurrence and impact of Heterobasidion and whether treatment is warranted after harvest in pine.



Grand fir mortality.

Grand Fir Mortality

Mortality in grand fir of all ages and size classes has been observed throughout its range in western Montana. Fir engraver and other bark beetle species have been identified on dead and dying trees. These beetles are typically regarded as opportunistic pests that attack weakened trees rather than acting as primary mortality agents. Evidence of root disease can be found stressing trees in some cases, but summer drought cycles may be playing an important role in predisposing grand fir to these otherwise minor pests.

Bark Beetles

Douglas-fir beetle (DFB) continues to attack Douglas-fir throughout the host range and primarily attacks mature trees that are stressed from fire, root disease, drought, and overstocking. 16,569 acres of DFB activity were recorded in 2017. DFB doesn't emerge and attack trees until approximately mid-May, thus potentially susceptible Douglas-fir that were scorched in the wildfires of late summer 2017 have not yet been attacked.

Only 7,972 acres of mountain pine beetle (MPB) were recorded, indicating that the widespread outbreak of the mid-2000's has waned. MPB persists at endemic levels throughout the host range with continued mortality in high elevation whitebark pine stands.



Bark beetle galleries in grand fir.

Black Pineleaf Scale

Black pineleaf scale continues to damage ponderosa pine in forests surrounding Missoula with pine engraver beetles attacking and killing some affected trees as well. No reports have been made from other geographic regions in the state thus far, nor has it been detected from aerial survey. Black pineleaf scale generally affects trees that are otherwise stressed by drought, overstocking, or other factors. While black pineleaf scale may not immediately kill trees outright, it can severely impede normal needle development and stunt growth, and ultimately kill trees if severe infestations are prolonged.

Black pineleaf scale as seen through a microscope.

Western Spruce Budworm

Western spruce budworm (WSBW) commonly defoliates Douglas-fir, grand fir, spruce and larch throughout the host range in the Montana. Mature trees typically survive WSBW infestations but may experience reduced growth or branch dieback, whereas smaller trees in the understory can be killed outright. WSBW was detected on 380,312 acres in Montana.



Western spruce budworm damage in Douglas fir in the Sapphires.

Gypsy Moth

Gypsy moth is a non-native invasive insect that aggressively defoliates a wide variety of trees species, including conifers, and can travel great distances as egg masses attached to RV's, trailers, and other recreational and outdoor equipment. A cooperative detection survey is conducted throughout the state by partnering agencies each year with no gypsy moths trapped in 2017.



Montana Counties Surveyed for Balsam Woolly Adelgid (BWA)

as of 2017

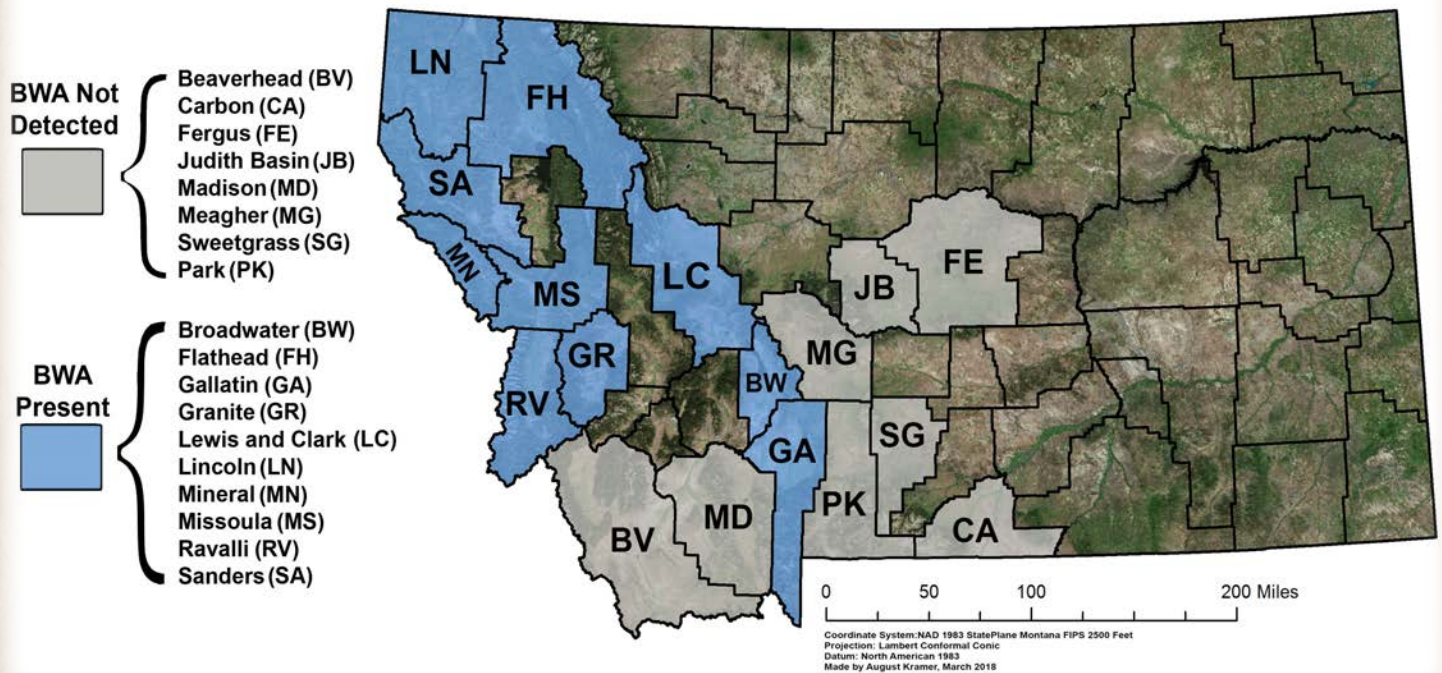
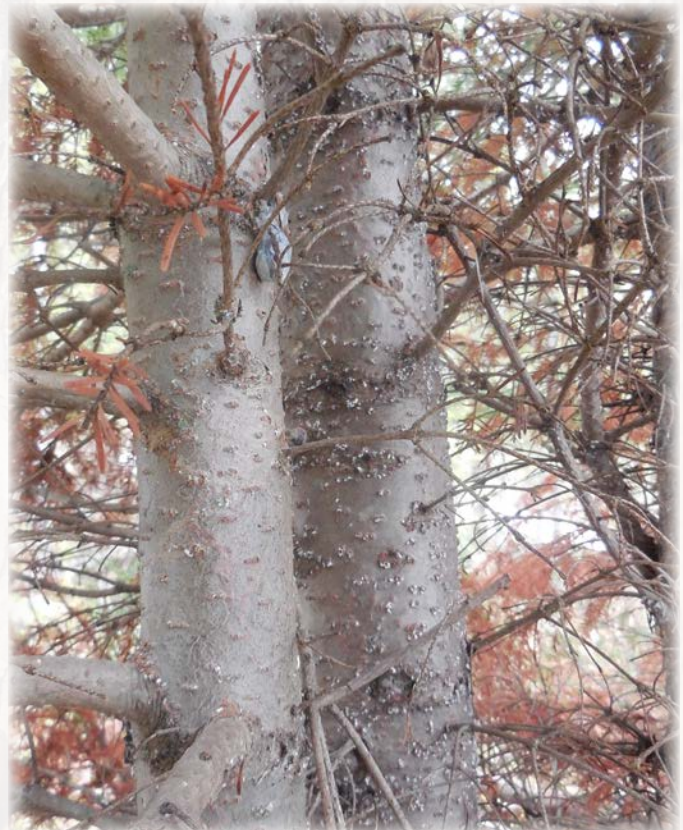


Figure 1. Distribution of Balsam Woolly Adelgid, 2017

Balsam Woolly Adelgid

Balsam woolly adelgid (BWA) is a non-native sap-sucking insect that was introduced into the western US in 1929 and has been a destructive pest of true fir forests, including subalpine and grand fir. Ongoing surveys throughout Montana have detected BWA in the following counties: Broadwater, Flathead, Gallatin, Granite, Lewis and Clark, Lincoln, Mineral, Missoula, Ravalli, Sanders.

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Woolly exterior of the Balsam Woolly Adelgid on subalpine fir.

Limber Pine Monitoring Plots Along the Rocky Mountain Front

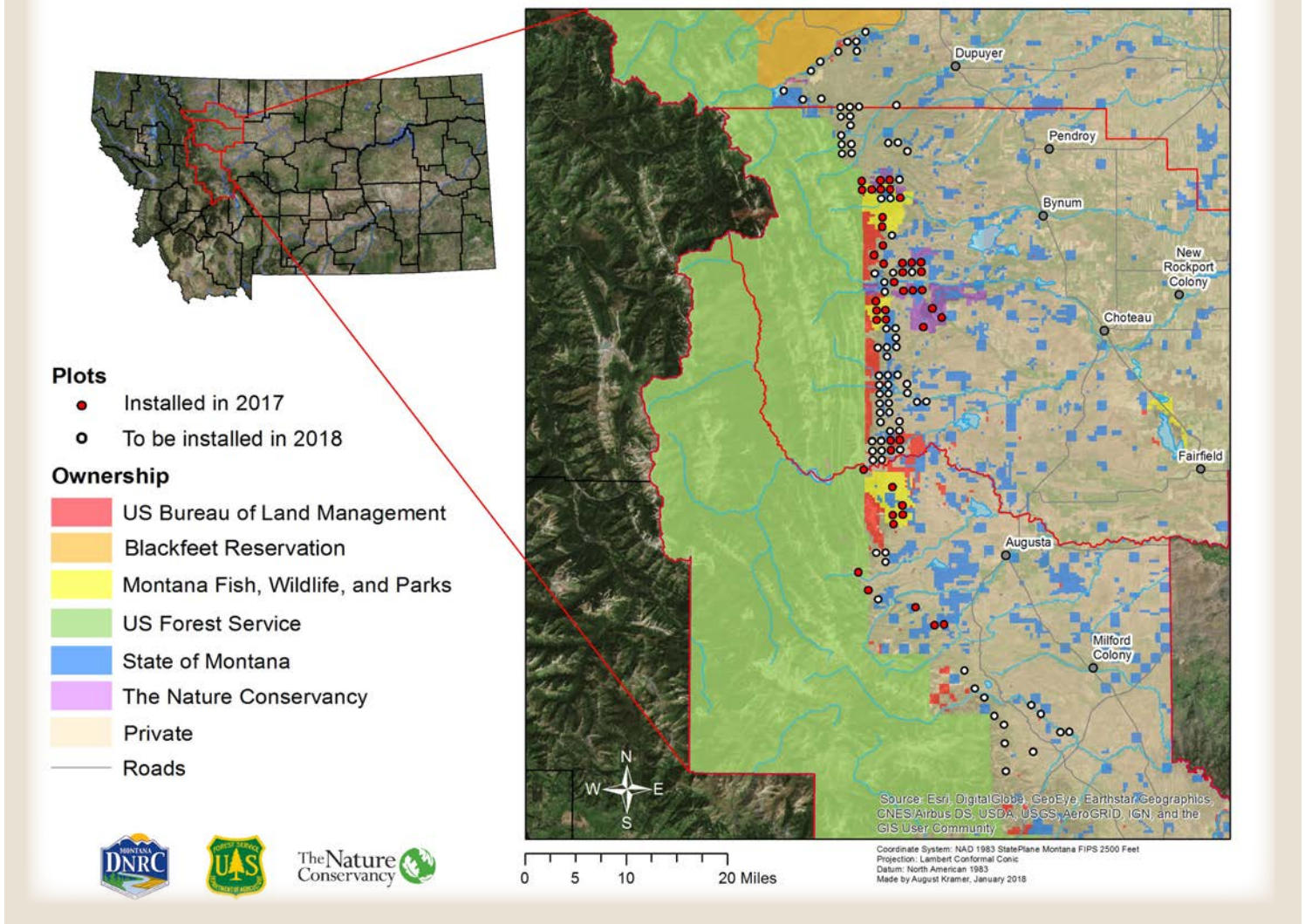


Figure 2. Distribution of Limber Pine Monitoring Sites in Lewis and Clark, Teton, and Pondera Counties, 2017

Limber Pine Monitoring on the Rocky Mountain Front

White pine blister rust (WPBR) is a non-native invasive fungus that was first detected on eastside limber pine near Glacier National Park in the mid-1930's (Riley 1944) in the northern region of the Rocky Mountain Front. The combined impacts of WPBR, mountain pine beetle, and changing climate patterns are suspected to be altering limber pine stands throughout this region; however, the impacts and the full suite of pest organisms are unknown. The USFS Forest Health Monitoring Program has funded a study to determine the distribution and condition of limber pine in this region. Project partners include Montana Department of Natural Resources and Conservation, USDA Forest Service, and The Nature Conservancy. Data gathered

from long-term monitoring plots will ultimately inform management decisions and determine the need for protection and/or restoration of this species in the Crown of the Continent ecosystem.

The Forest Health Highlights are a summary of the “Montana Forest Insect and Disease Conditions and Program Highlights 2017” which can be found at <http://dnrc.mt.gov/divisions/forestry/forestry-assistance/pest-management/montana-forest-pest-condition-reports>. The full report contains detailed narratives for each county surveyed, maps, and tables.

For paper copies or additional information, please contact the DNRC Forest Pest Management Program at 406-542-4300.