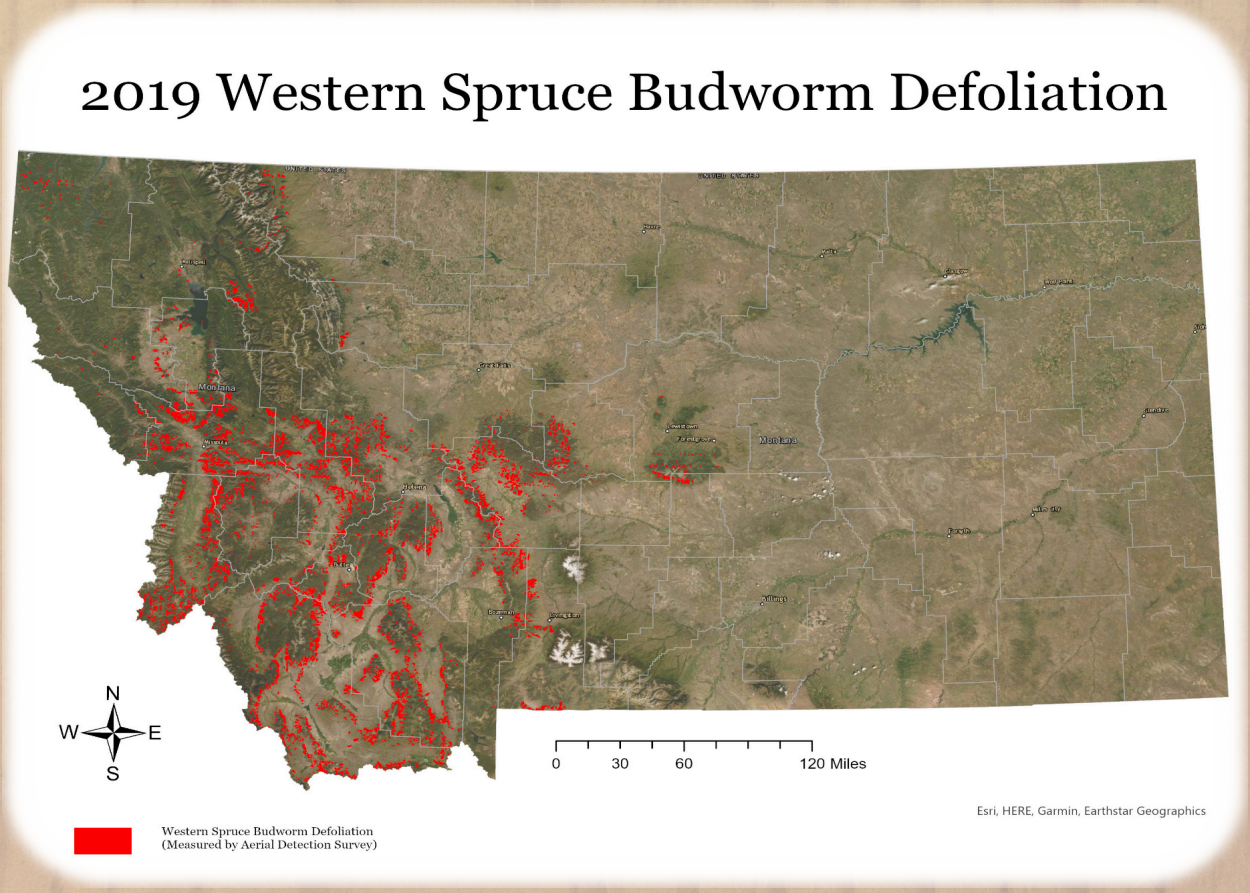
Montana Forest Health Highlights 2019

Montana's 23 million acres of forested land include a diversity of tree species including pine (lodgepole, ponderosa, whitebark, limber and western white), Douglas-fir, true firs (grand and subalpine), spruce and larch. Each of these trees hosts its own suite of insects and diseases, many of which go largely unnoticed until an outbreak occurs that causes notable damage on a landscape scale. This report highlights current conditions of the more common forest insects and diseases in Montana along with special pest surveys.

Montana forests are also altered by drought and fire. Over the last 60 years there has been an overall decrease in annual precipitation and increase in summer temperature across much of Montana*. In 2012 the state experienced the driest July to September period in the historical record, and recent trends have continued through 2019. Extended dry periods increase susceptibility to insects and diseases in addition to raising the risk of wildfire, and in 2019 64,835 acres of forest were burned.

Western Spruce Budworm

Western spruce budworm (*Choristoneura freemani*) continued to be ubiquitous in 2019, causing defoliation on 555,818 acres of Douglas-fir, true fir, spruce and western larch. Defoliation occurred primarily in the western half of the state, with severe defoliation occurring around Missoula, Ovando, and in the Swan and Little Belt Mountain Ranges.



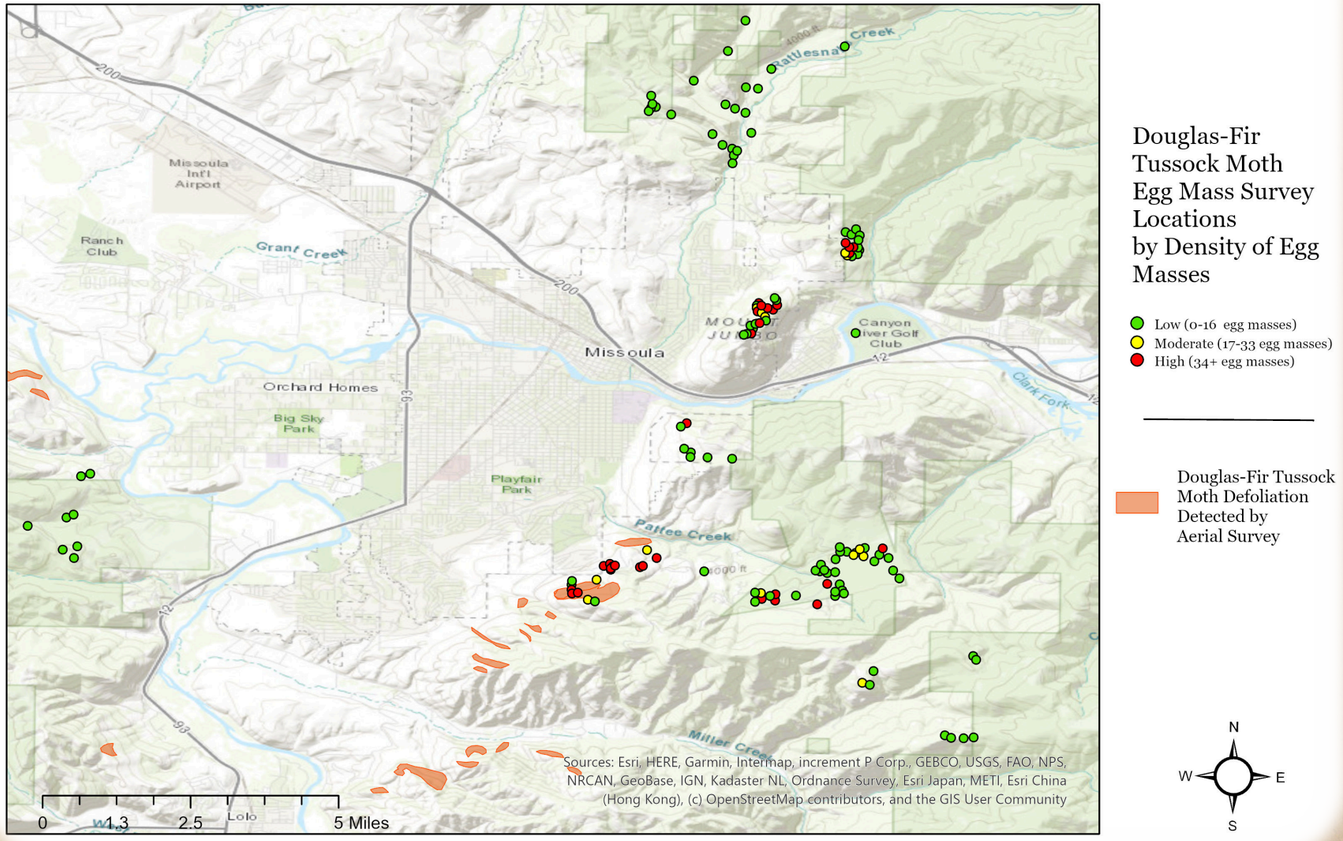
*Source: https://statesummaries.ncics.org/chapter/mt/

Douglas-Fir Tussock Moth

Douglas-fir tussock moth (*Orgyia pseudotsugae*) commonly damages the tops of ornamental Colorado blue spruce in the year prior to a larger scale outbreak in surrounding forest lands. This pattern held true with damage documented in ornamental Colorado blue spruce in 2018 and widespread damage to Douglas-fir in forests around Missoula, Flathead Lake, Plains, Kalispell and Columbia Falls in 2019. Aerial survey detected defoliation attributed to Douglas-fir tussock moth on 12,184 acres. Some areas of defoliation had been observed in previous outbreaks, most recently in 2012. Other areas, notably around Missoula, had not been widely observed in past outbreaks. In the Missoula area, Douglas-fir tussock moth caused noticeable defoliation in Pattee Canyon, Rattlesnake Recreation Area, Mount Jumbo and Mount Dean Stone, Blue Mountain, Black Mountain and the Frenchtown face.

Douglas-fir tussock moth larvae

2019 Douglas-Fir Tussock Moth Egg Mass Surveys



Douglas-fir tussock moth egg mass on a Douglas-fir branch

Defoliation of Colorado blue spruce in northwest Montana

Douglas-fir tussock moth usually feeds on Douglas-fir, but can occasionally attack ponderosa pine in heavily infested areas. Damage can range from light chewing in tree tops to complete defoliation of entire trees. Mature, vigorous trees can often overcome a single year of defoliation while subsequent years of heavy feeding can lead to mortality. Understory trees oftentimes do not have adequate nutrient reserves and are killed by a single year of heavy defoliation.

Outbreaks of Douglas-fir tussock moth typically last for approximately 2-3 years and are then controlled by a buildup of a lethal virus in the population. To assess whether or not the virus can be expected to control the outbreak in 2020, state and federal agency personnel conducted 187 egg mass surveys throughout the affected region. Density and viability of egg masses were used to identify areas that may have ongoing Douglas-fir tussock moth activity.

Defoliation of Douglas-fir in Missoula

Bark Beetles

Bark beetle activity was relatively low throughout the state. Overall, mountain pine beetle (*Dendroctonus ponderosae*) damage continued at low levels and was detected on 24,848 acres, the majority of these acres were categorized as “low severity”. Western pine beetle (*Dendroctonus brevicomis*) was active in western Montana, particularly in mature ponderosa pines that were damaged or stressed, but only detected on 68 acres. Douglas-fir beetle (*Dendroctonus pseudotsugae*) continued to be active throughout the state, with mortality detected on 24,060 acres. Fir engraver (*Scolytus ventralis*) caused mortality on 32,348 acres throughout the range of subalpine and grand fir, particularly in diseased or drought-stressed trees in northwestern Montana.

Galleries created by fir engraver in grand fir

Drought Effects

Moisture deficit during critical summer periods may have contributed to the decline of mature trees in the northwest part of Montana. Trees that appeared to be otherwise healthy rapidly declined and were infested by secondary bark beetles that are known to typically attack dead and dying trees. Primarily grand fir and Douglas-fir were affected although other tree species have been noted with similar decline patterns.

Effects of drought on grand fir in northwest Montana

Monitoring Projects

State forestry agencies in Washington, Idaho and Montana conducted surveys to determine the distribution of northern spruce engraver (*Ips perturbatus*) and European spruce bark beetle (*Ips typographus*). Pheromone-baited traps were set in three sites in Montana in the Stillwater State Forest, Swan State Forest, and on State Trust Lands near Anaconda. Collections were made from late June through the end of September. Beetles have been sorted and prepared for identification.

Traps were also set for gypsy goth (*Lymantria dispar*) by state and federal agencies, with one positive detection (European) from Wayfarer's State Park in Flathead County. Montana Department of Agriculture has made plans to further survey the area in the summer of 2020 to determine the extent of European gypsy moth occurrence and what management, if any, is warranted.

A state employee checks a Lindgren funnel trap in the Stillwater State Forest

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