Montana Forest Health Highlights 2021

Montana's diverse landscape includes approximately 26 million acres of forested land, most of which is located west of the continental divide. Forests are primarily composed of Douglas-fir, ponderosa pine, and lodgepole pine with smaller components of western larch, true fir species, and spruce. Forest health issues commonly ebb and flow as populations of pests outbreak in response to triggering events such as weather events, wildfire, and climate. Multiple decades of drought conditions have had a cumulative impact on Montana trees, leaving forests less resilient to insect and disease issues.

2022 Aerial Detection Survey

The USDA Forest Service conducts an annual Aerial Detection Survey (ADS) which provide valuable information about the location and severity of forest health issues across the state. In 2021, approximately 14 million acres were surveyed in Montana, which is approximately half the number of acres surveyed in the recent past. This decrease is largely attributable to reduced capacity due to the COVID-19 pandemic and low visibility resulting from wildfire smoke. Although 13-14 million acres were surveyed each year in 2020 and 2021, only 8.9 million of these acres were surveyed during both years. Surveys are generally prioritized around the more forested western part of the state, although insects and disease are an equally important driver of forest conditions in the east.

Foliar Diseases

Pine shoot and foliage diseases were notable throughout western Montana in 2021 with an approximate 75% increase compared to 2020. Branch flagging was readily apparent in ponderosa pines and caused by a combination of western gall rust, Diplodia shoot blight, and Elytroderma needle cast.

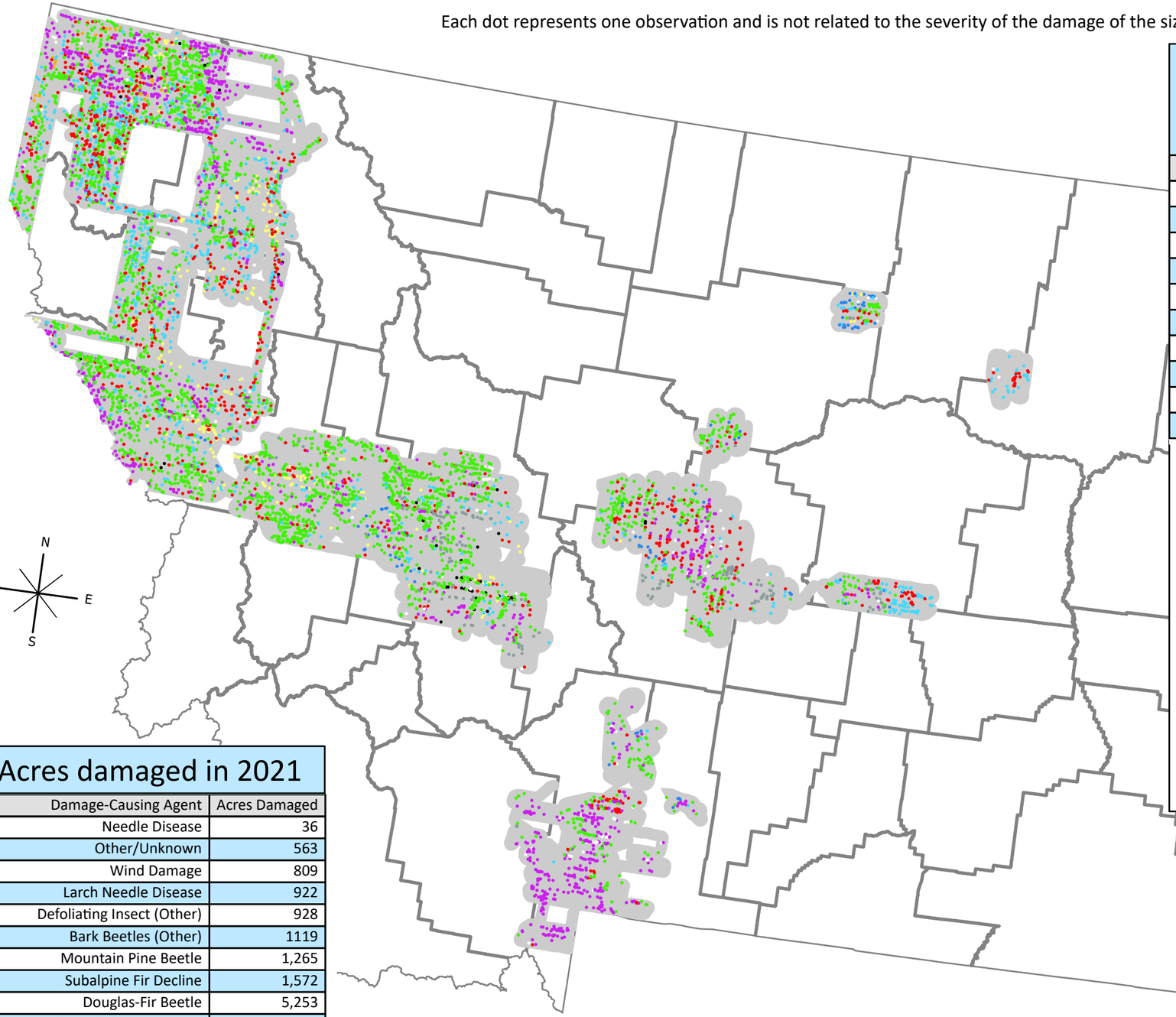
Western gall rust on ponderosa pine.

Defoliators

Most of the defoliation captured by the 2021 ADS data was caused by western spruce budworm, causing 11,640 acres of damage. Black leaf pine scale continued to expand in the Woods Gulch area near Missoula while Douglas-fir tussock moth appeared to have subsided throughout its previous outbreak area in western Montana. Ash draws near Baker recovered following the fall cankerworm outbreak of the previous year. Although there was limited coverage in the eastern portion of the state, field reports noted the presence of pine tussock moth on ponderosa pine in southeastern Montana.

Montana 2021 Aerial Detection Survey

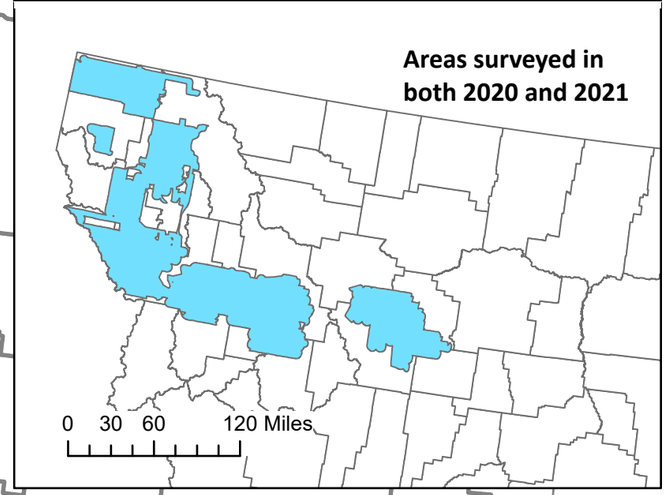
Each dot represents one observation and is not related to the severity of the damage of the size of the damaged patch.



Comparing 2020 and 2021

Comparisons between years are calculated using only the areas surveyed during both 2020 and 2021.

Damage-Causing Agent	2020	2021	Percent Change
Bark Beetle (Other)	1,562	485	-69%
Defoliating Insect	47,565	694	-99%
Douglas-Fir Beetle	5,071	4,652	-8%
Larch Needle Disease	3,692	794	-79%
Mountain Pine Beetle	1,559	555	-64%
Other/Unknown	548	464	-15%
Pine Foliar Disease	45,66	8,039	+75%
Subalpine Fir Decline	1,600	1,261	-21%
Western Spruce Budworm	53,795	10,162	-81%
Wind Damage	125	768	+517%



Acres damaged in 2021

Damage-Causing Agent	Acres Damaged
Needle Disease	36
Other/Unknown	563
Wind Damage	809
Larch Needle Disease	922
Defoliating Insect (Other)	928
Bark Beetles (Other)	1119
Mountain Pine Beetle	1,265
Subalpine Fir Decline	1,572
Douglas-Fir Beetle	5,253
Pine Needle and Shoot Diseases	8,409
Western Spruce Budworm	11,640

- Area Surveyed in 2021
- County Outlines
- Subalpine Fir Decline
- Wind Damage
- Other/Unknown
- Bark Beetles (Other)
- Douglas-Fir Beetle
- Mountain Pine Beetle
- Pine Needle and Shoot Diseases
- Larch Needle Disease
- Western Spruce Budworm
- Defoliating Insect (Other)

Bark Beetles

Bark beetles caused damage on approximately 6,500 acres with Douglas-fir beetle contributing to 5,249 of these acres, primarily in northwestern Montana. Douglas-fir beetle was ubiquitous throughout the host range of Douglas-fir with blowdown, wildfire, and drought contributing to its increase.

Boring dust caused by Douglas-fir beetle on downed Douglas-fir tree.

Root Disease

Root disease is an important cause of tree decline and mortality in Montana but the symptoms are too subtle to be sensed with the Aerial Detection Survey. As a result, the true extent of root disease in Montana is not known exactly but, based on field observations and site conditions, is presumed to be extensive. Various root diseases present in Montana include Armillaria, Heterobasidion, Schweinitzii, and Tomentosus root diseases.

Invasive Species

Spongy moth (*Lymantria dispar*, formerly known as gypsy moth) has caused severe damage to forests in the eastern United States since the late 19th century. Despite occasional introductions into Montana, it has not yet become established in the state. Pheromone-baited traps are set annually throughout the state to assist in early detection and rapid response of the pest. In 2021, a male spongy moth was found in a trap near Lewistown. Surveys of suitable spongy moth habitat in the Lewistown area were conducted in the early part of 2022 and no egg masses were found.

Pine roots rotted by Heterobasidion root disease.

As of 2021, emerald ash borer has not been detected in the state of Montana. Destructive branch sampling workshops were held in Missoula, Helena, Bozeman, and Billings to demonstrate ash inspection methods and to search for signs of emerald ash borer infestation. No beetles were detected, yet 40 tree care specialists were trained in survey methods. Ash does not occur in Montana's western forests but it is an important feature of riparian habitats in eastern Montana. Furthermore, it is a commonly planted ornamental and shade tree comprising up to 60% of the canopy cover in some communities.

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