2019 Rocky Mountain Region Aerial Survey Results

In 2019, aerial surveys were conducted over 44.5 million acres within the Rocky Mountain Region.

Above: Aircraft used in aerial detection surveys. Right: Lodgepole pine mortality caused by mountain pine beetle in the Taylor Canyon area of the Gunnison National Forest, Colorado. Photo credits: Justin Backsen, U.S. Forest Service

Aerial surveys provide an annual snapshot of forest health conditions over large areas more efficiently and economically than other methods. The US Forest Service partners with State Cooperating Agencies to conduct the annual survey.

To conduct the survey, observers in small aircraft record areas of activity using a digital aerial sketchmapping system that incorporates a tablet computer, geographic information systems and global positioning system technology. Aircraft used for these flights in the Rocky Mountain Region are typically small, high-wing planes such as the Quest Kodiak 100 and Cessna T206. Aircraft fly in either a grid pattern over relatively flat terrain or following the contours of the terrain in mountainous or deeply dissected landscapes.

For more information, please contact
Region 2 Forest Health Protection

2019 Rocky Mountain Region Aerial Survey Results

Fix issues in your story × | Edit × | A Story Map

Introduction | 2019 All Damage Types | Spruce Beetle | Western Spruce Budworm | Douglas-fir Beetle | Western Balsam Bark Beetle | Roundheaded Beetle Complex | Aspen Discoloration and Defoliation

Bark Beetles

Region-wide, the total acreage of new tree mortality attributed to bark beetles declined; however, large epidemics of spruce beetle and roundheaded/western pine beetles in Colorado continue to expand.

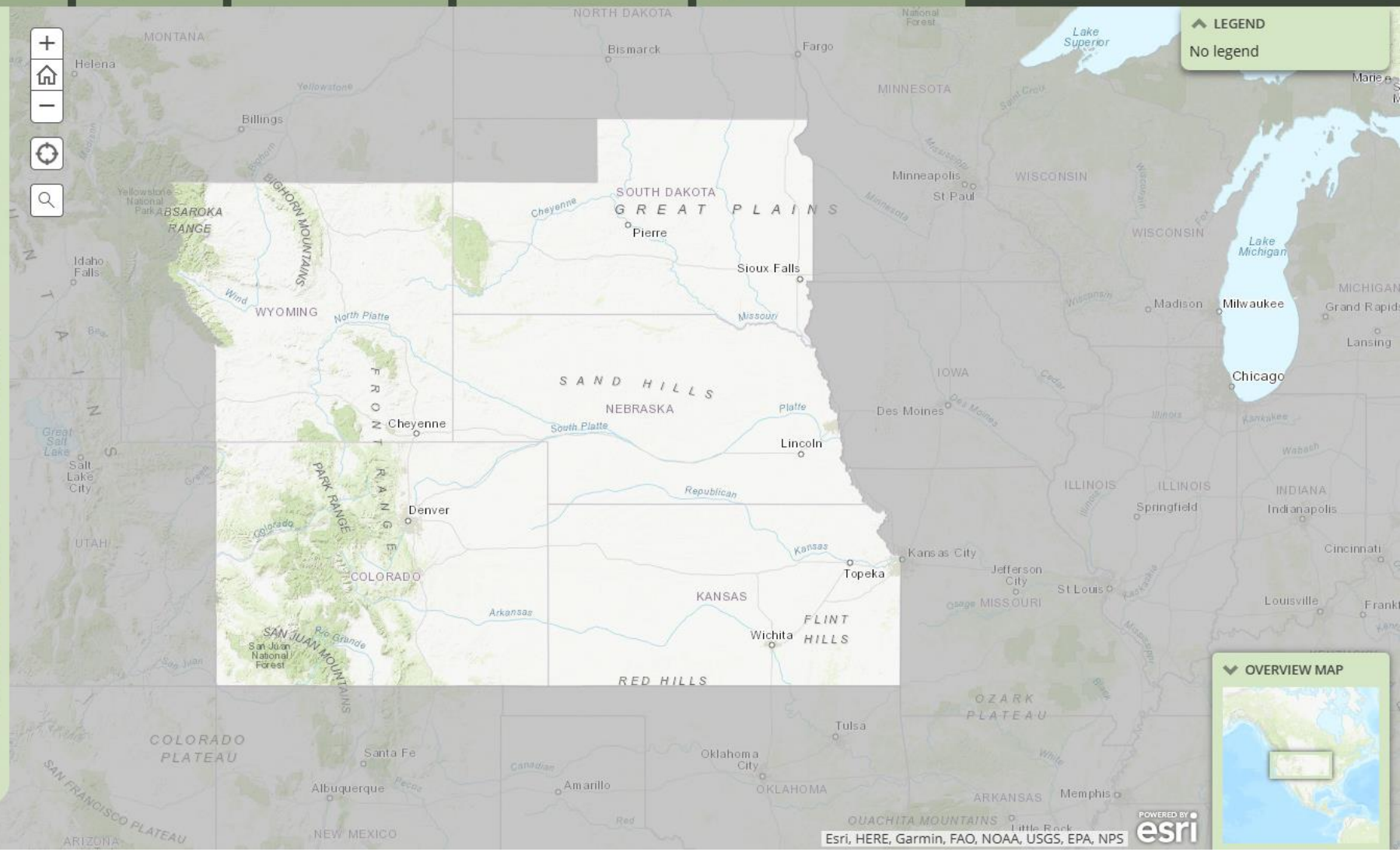
Defoliation and Abiotic Injury Summary

Defoliation from insects generally decreased across the region. However, tree damage and mortality as a result of defoliation is significant. Cool, wet spring and early summer conditions in 2019 were widespread and gave way to leaf and needle diseases that can be difficult to distinguish from insect defoliation while in the air.

One notable windthrow event was noted on the Bighorn National Forest.

Avalanches were abundant in 2019 and may warrant additional monitoring for bark beetle activity depending on the species and size of trees taken down and in adjacent stands.

Avalanche damage near Gulley Creek on the White River National Forest, Colorado. Photo credit: Justin Backsen U.S. Forest Service.



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Spruce Beetle (Fact Sheet)

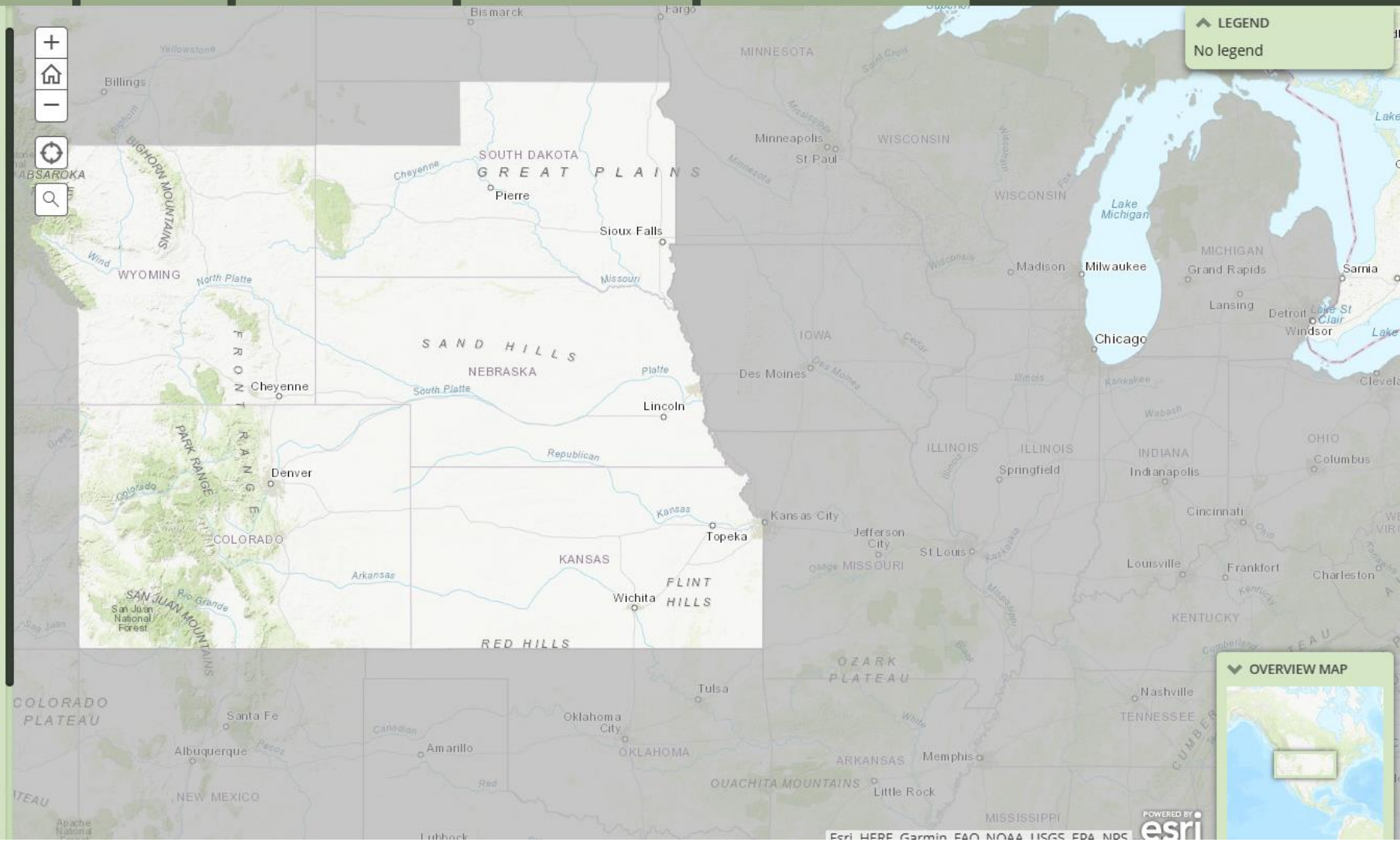
Spruce beetle epidemics continue to expand in Colorado and western Wyoming. Separate spruce beetle epidemics that began in the early 2000s have moved through mixed spruce forest types on 2,437,000 acres.

The epidemic is declining in many areas where most of the overstory spruce was depleted. Larger diameter trees are necessary for epidemics to grow. Aerial surveys detected new fading spruce killed by spruce beetle on 93,300 acres in Colorado and Wyoming in 2019. Of these, 25,000 acres are in newly mapped areas.

In Colorado, epidemics have slowed where host trees were depleted and increased where adjacent stands of uninfested green spruce exist. Notable areas of spruce beetle activity detected in 2019 aerial surveys include: areas in and adjacent to Rocky Mountain National Park in Northern Colorado and areas in and around the Buffalo Peaks Wilderness, the Collegiate Peaks, the Uncompahgre Wilderness, and portions of the southwestern Weminuche Wilderness in Southern Colorado.

In Wyoming, aerial surveyors detected spruce beetle activity on over 4,000 acres in areas south of Togwotee Pass where much of the overstory was depleted by the ongoing outbreak. On the Bighorn National Forest, where spruce forest types are still largely unaffected by spruce beetle, 60 acres with new spruce beetle killed trees were detected in Sheridan County.

The needles on spruce trees impacted by beetles fade slowly making it hard to detect from the air when lighting conditions are poor or when flights are done too early. The cold, late winter and spring and large, late snowpack across much of the region also delayed fading based on our ground observations. As a result, we may have underestimated spruce mortality throughout the region in 2019.



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Western Spruce Budworm (Fact Sheet)

Western spruce budworm activity was locally abundant in northern Wyoming and across the southwestern part of Colorado.

Aerial surveys detected 182,000 defoliated acres in the Rocky Mountain Region in 2019.

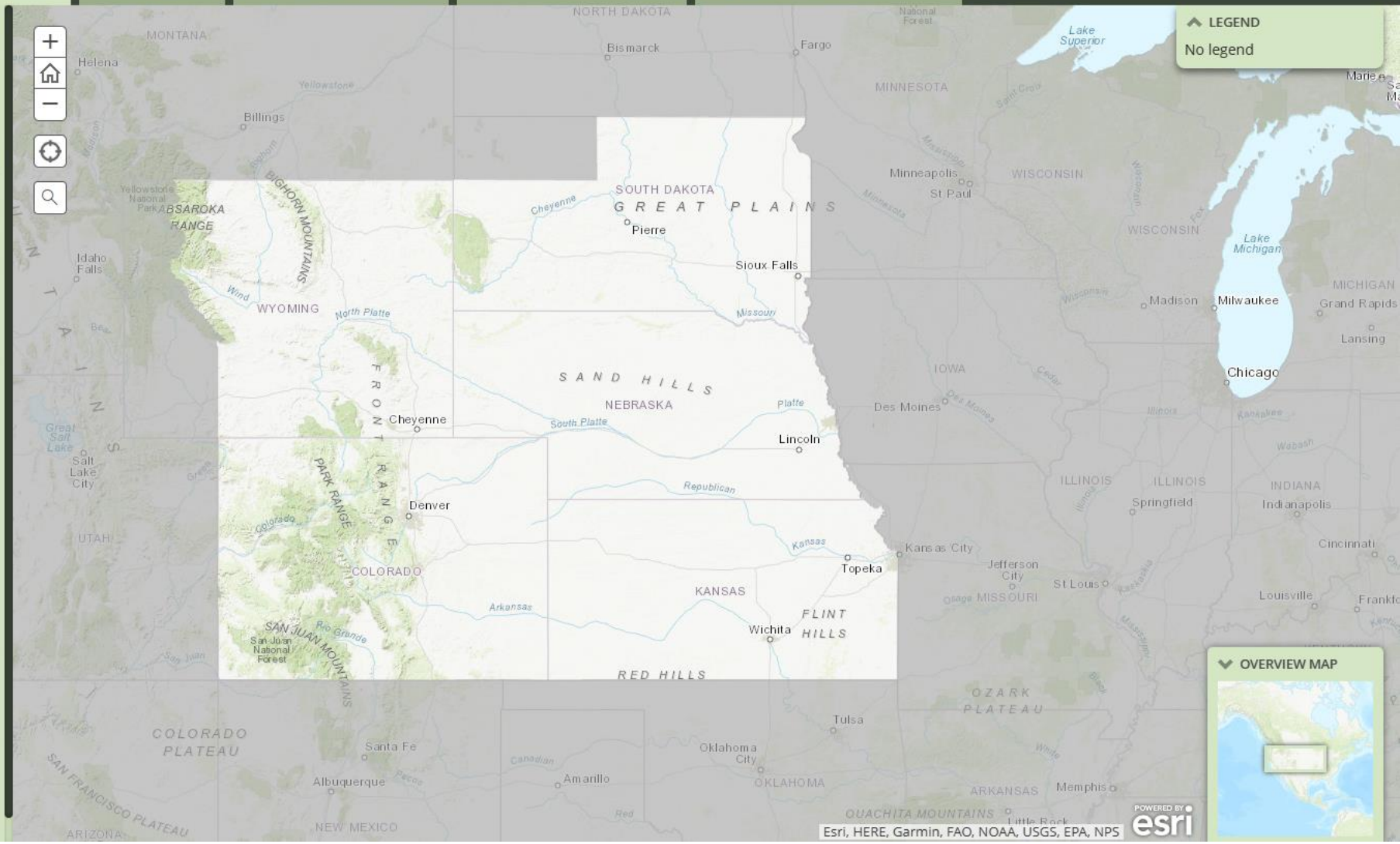
This insect feeds on the new needles of white fir, Douglas-fir and less notably on spruce and subalpine fir. Drying needles webbed to twigs impart a brown cast to infested trees.

Areas on the north zone of the Shoshone National Forest and on the Rio Grande National Forest have had consecutive years of heavy defoliation that continues to kill trees. Activity was also notable on the Bighorn, Pike, San Isabel, Gunnison, San Juan, and Uncompahgre National Forests and adjoining lands.

The Shoshone National Forest is thinning Douglas-fir stands and salvaging timber in response to the heavy defoliation.

The Wyoming State Forestry Division, Bureau of Land Management and private landowners are cooperatively managing western spruce budworm south of the Bighorn National Forest. Click here to learn more about this project.

Western spruce budworm activity in Douglas-fir near Boulder Ridge, Wyoming as observed from the 2019 aerial detection survey. Photo credit: Justin Backsen, USDA Forest Service



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Douglas-fir Beetle (Fact Sheet)

In 2019, aerial surveyors detected Douglas-fir beetle activity on 7,400 acres and expanded onto 6,000 new acres in Colorado.

In recent years, Douglas-fir tree mortality rates varied widely from scattered mortality in some stands to almost total loss of mature Douglas-fir in others.

The mortality is geographically widespread and affects Douglas-fir in almost all locales throughout Colorado. Notable areas affected include portions of the Gunnison, Rio Grande, Uncompahgre, San Juan and White River National Forests.

In Wyoming, Douglas-fir beetles have been at low levels following large outbreaks in the early 2000s. Areas on the north zone of the Shoshone National Forest and south of the Bighorn National Forest are at increased risk due to years of heavy western spruce budworm defoliation.

Douglas-fir beetle activity in Douglas-fir on the Pike National Forest as observed from the 2019 aerial detection survey. Photo credit: Justin Backsen, USDA Forest Service

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Western Balsam Bark Beetle (Fact Sheet)

Aerial surveyors detected western balsam bark beetle activity on 23,000 acres in subalpine fir across Colorado and on 5,700 acres in the Rocky Mountain Region portions of Wyoming.

These infestations are generally widespread; however, they kill fewer trees per acre than other bark beetles currently active in Colorado and Wyoming.

This tree mortality is often associated with root disease in high-elevation forests.

Where western balsam bark beetle occurs in spruce beetle-affected stands, overall stand mortality is increased.

Western balsam bark beetle activity in subalpine fir in northern Colorado as observed from the 2019 aerial detection survey. Photo credit: Justin Backsen, USDA Forest Service

2019 Rocky Mountain Region Aerial Survey Results

Roundheaded Pine Beetle (Fact Sheet) and Western Bark Beetle (Fact Sheet) Complex in Ponderosa Pine

The northern range of the roundheaded pine beetle, *Dendroctonus adjunctis*, extends into southern Colorado where it occurs with western pine beetle, *D. brevicomis* and mountain pine beetle in ponderosa pine.

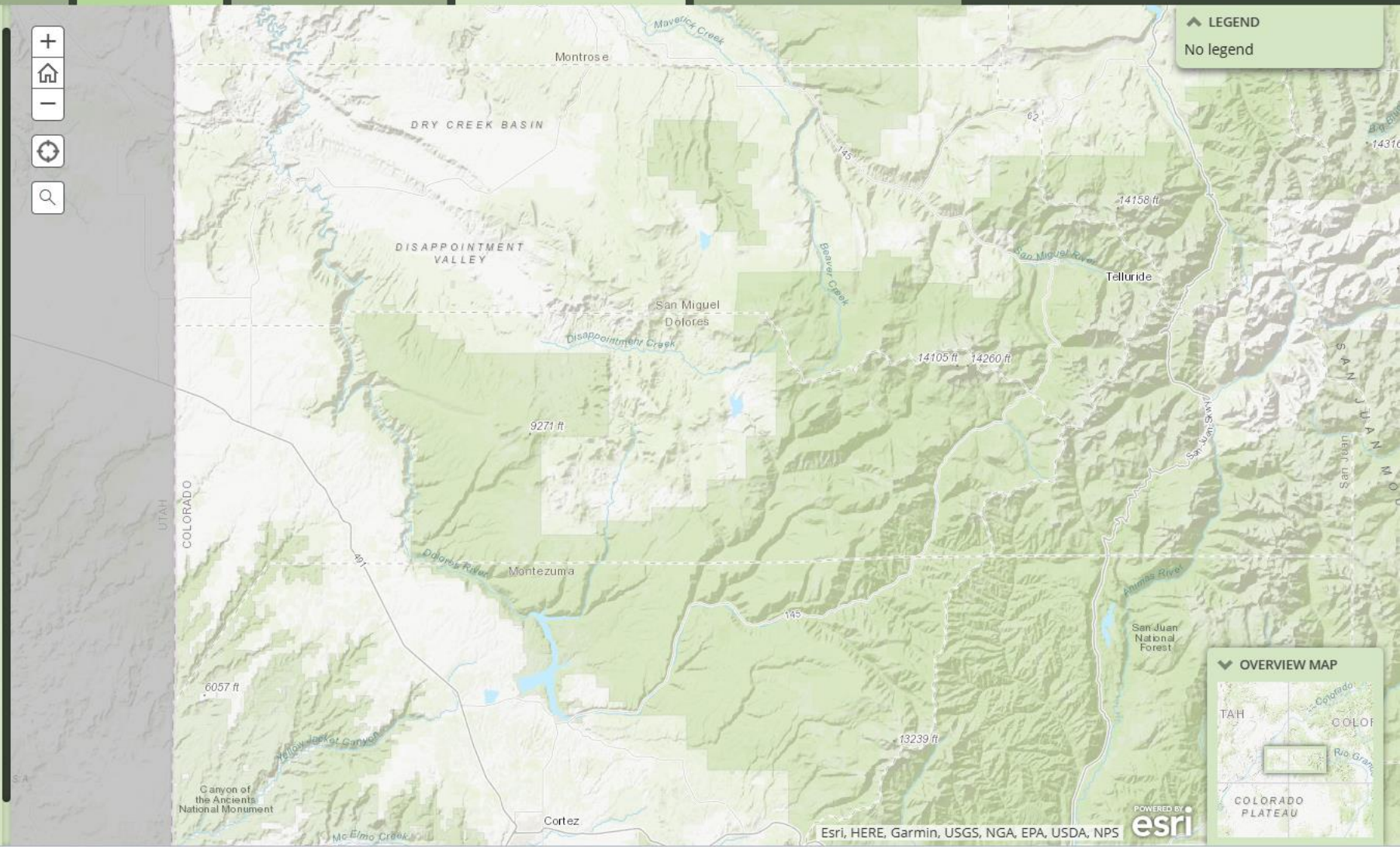
An outbreak of roundheaded pine beetle, and to a lesser extent western pine beetle, on the San Juan National Forest has continued to expand since 2011. While roundheaded pine beetle outbreaks typically have a shorter duration in southwestern forests, this outbreak has continued to increase in intensity within available pine hosts.

Aerial detection surveys recorded over 22,000 acres on the Dolores Ranger District in 2019 with varying intensity of beetle-caused tree mortality. The area affected is within the San Juan National Forest's suitable timber base and is a valuable resource for local mills.

USFS Forest Health Protection entomologists, in partnership with the Colorado State Forest Service, are tracking the extent/intensity of the outbreak, bark beetle flight times and determining bark beetle species killing trees.

Unlike other *Dendroctonus* species, flight times of adult roundheaded pine beetles occur primarily in the fall with a smaller percentage of beetles flying in spring. Forest health funding assisted San Juan National Forest with removing infested trees and thinning 628 acres in 2019.

Roundheaded and western pine beetle caused tree mortality in southwestern Colorado. Photo Credit: Dan West, Colorado State Forest Service.



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Fix issues in your story × | Edit × | A Story Map

Aspen Discoloration and Defoliation

Large Aspen Tortrix Fact Sheet
Western Tent Caterpillar Fact Sheet
Marssonina Leaf Blight Fact Sheet

In 2019, aerial surveyors observed aspen defoliation/foliar damage caused by a combination of defoliators and other biotic and abiotic causal agents on over 65,000 acres, primarily in Colorado.

Aspen defoliation and discoloration can be caused by the large aspen tortrix, western tent caterpillar, Marssonina leaf spot and abiotic damage caused by late spring frosts or high winds. These factors produce similar aerial signatures and must be ground-checked to verify what specifically caused the damage in a particular stand.

Much of the damage aerial surveyors observed in 2019 was caused by Marssonina leaf spot, which is common after a wet spring. Aspen typically survives defoliation events; however, repeated defoliation over several years can cause mortality.

Marssonina leaf blight leads to leaf discoloration and pre-mature defoliation. Photo credit: Jim Blodgett, USDA Forest Service