

# What's eating my trees and berries? Geometrid moths in South Central Alaska.



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An outbreak of defoliators has been occurring in South-central Alaska during the last two years. Hundreds of trees and berry plants have been completely or nearly completely defoliated at the upper reaches of Hiland and Arctic Valley Roads north of Anchorage; Summit Lake, Homer, and Seward on the northern Kenai Peninsula; and around Nanwalek on the southern Kenai.



Caterpillars fed on opening buds and expanding leaves in mid-May. Feeding ended by early July when larvae dropped to the ground to pupate. The adult moths began emerging in late August. Bruce spanworm and the autumnal moth fly late in the year. Re-foliation of affected trees has been monitored throughout the summer, and different tree species showed a variety of rates and patterns of recovery.



Similar outbreaks have been seen west of Cook Inlet on alders from Tuxedni Bay to Iniskin Peninsula and on dwarf birch and willow near Snipe Lake, Chilikadrotna River, and Mulchatna River. Little is known about these western infestations, except that the insects responsible vary with location.

## What is eating these trees and berries?

Several geometrid moth species have been associated with this event in these areas, but *Eulithis* spp., the autumnal moth, *Epirrita autumnata*, and Bruce spanworm, *Operophtera bruceata*, appear to be the primary agents.



*Eulithis* sp.    *Epirrita autumnata*    *Operophtera bruceata*

These moths are exceptional among many other insects because they appear so late in the season when the activity and behavior of most insects and many other animals are stifled by low temperatures.

The physiology and anatomy of the autumnal moth and Bruce spanworm are apparently well-suited for flying in cold temperatures. Bruce spanworm has even been seen flying during snow storms!

## Which tree species were most affected?

Willow, birch, salmonberry, blueberry, alder, cottonwood, and various high elevation shrubs have been affected. Defoliation could be found in elevation bands above 1400 ft in the Matsu Valley and northern Kenai Peninsula (primarily *Eulithis* spp.), and much lower on the southern Kenai and Anchorage bowl (*Epirrita* and *Operophtera*).

## What is the condition of infested trees?

When the defoliators had finished, they left a vast landscape of denuded trees of all shape, sizes, and ages. We have monitored the vegetation at these and many other locations to follow the subsequent impacts on forest health. Not all trees were impacted, nor did they respond to the same extent. Few trees died.

Different tree species varied in severity of defoliation. The moths seemed to have a preference for willow and scrub/dwarf birch followed in order by alder, paper birch and poplar. In addition, various berry crops were prime foods, including salmon berry and blueberry.



Recovering willow    Recovering dwarf birch

## How long does it take for infested trees to recover?

Since defoliation occurred so early, most affected trees have been in the process of recovery for most of the summer. The patterns and rates of recovery differ among various affected species and these growth patterns impact crown shape and crown density. These varying growth habits have resulted in a diverse landscape. This is part of the heterogeneous nature of forest landscapes and one reason that it is unusual for all trees to be lost during insect or disease outbreaks.



## Are the moths coming again?

Yes. The moths are here again this year as they were last year. The abundance of the moths makes us think that it is probable that another year of defoliation is coming.

**Aknowlegements.** The help of Jim Kruse and Dominique Collet in identifying moths is much appreciated.