

Wood Boring Insects in Alaska

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Forest Health Protection
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Wood boring insects are commonly associated with diseased, stressed, or dying spruce trees in Alaska. Commonly encountered woodborers are members of two insect orders; the Coleoptera, or the beetles, and the Hymenoptera, or the wasps. The wood boring beetles are members of two families; the long-horned beetles (also called roundheaded woodborers) (Cerambycidae) and the metallic woodborers (flatheaded woodborers) (Buprestidae). Adult long-horned beetles are characterized by antennae that are at least as long as their body (Figure 1). Their larvae have a rounded head, and they make galleries in the sapwood that are rounded when viewed in cross section. Metallic woodborers are wedge-shaped beetles and are often shiny in appearance (Figure 2). Their larvae have a flattened head, and they make oval-shaped galleries in the sapwood when viewed in cross section. Wood wasps are large, menacing looking yellow and black wasps about 2.5 cm long (cover photo). Their larvae are stout, legless grubs, about 1.5 cm long, with a darkened horny protuberance on the rear end (Figure 3). All three woodborers have similar life histories.



Figure 1. Adult long-horned beetle, *Monochamus scutellatus*.

Figure 2. Adult metallic woodborer, *Melanophila* sp.



Generally, woodborer larvae are elongate and whitish; they have a legged or legless body, depending on the species, and dark brown mandibles (Figure 4). Full-grown woodborer larvae measure about 5 cm in length.

Woodborers are commonly mistaken for bark beetles, particularly the spruce beetle (*Dendroctonus rufipennis*) and the engraver beetle (*Ips* sp.). However, woodborer adults and larvae are three to five times the size of bark beetles. In addition, bark beetles feed under the bark and do not penetrate the wood, as do most woodborers.

Life History

Adult woodborers fly in late spring through mid-summer, mate, and find a suitable host tree in which the female lays an egg (oviposit) under the tree bark. Eggs hatch into larvae that feed throughout the summer on phloem. In late summer, cerambycid, wood wasps, and some buprestid larvae bore into the sapwood where they overwinter, pupate and emerge in spring as adults, completing the life cycle (Figure 5). Some buprestid larvae spend their entire immature life in the phloem region.

The length of life cycle depends on the species and densities of woodborers and environmental factors such as temperature and moisture content of the sapwood. Some species in other parts of the country are said to have life cycles as long as seven years.

Some woodborers overwinter as larvae in the phloem of standing trees either below or above the snowline, depending on species. Others, such as the buprestid *Chrysobothris trinervia*, presumably overwinter as adults. Pupation usually occurs during a short period in the spring for those borers with one-year cycles.

Forest fires have a significant effect on wood-borer activity. Some species are attracted to fire, using infrared sensors located on their

Figure 3. Wood wasp larva.



Figure 4. Wood borer larvae:
A. Roundheaded borer (*Cerambycidae*);
B. Flatheaded borer (*Buprestidae*).

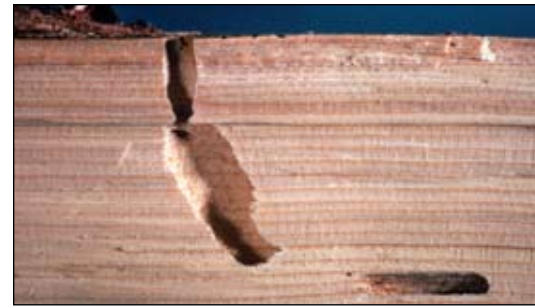
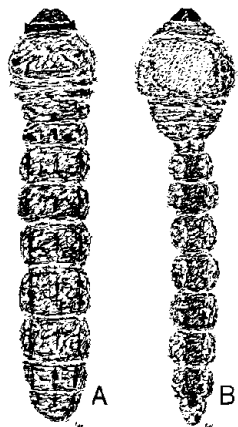


Figure 5. Roundheaded woodborer gallery, *Monochamus* sp.

bodies. *Melanophila* sp. (Figure 2) oviposits in large roots exposed by fire and around the base of burned trees, not higher than a meter above ground. High densities of a cerambycid, *Monochamus scutellatus* (Figure 1), were found ovipositing in burned trees from the bases to about 10 m aboveground.

Wood boring insects may be considered beneficial in the forest, where they aid in the breakdown and decomposition of dead woody material. Their larval galleries in the wood create entryways for pathogens to become established, which further break down the cellulose and fibers within the trees and replenish the soil with nutrients for new plant growth. Woodborers are detrimental when they cause economic losses in the form of wood degradation and volume loss.

Detection and Damage

Woodborers can be detected in trees in a number of ways, depending on the developmental stage of the beetle. In their early stages when the larvae are feeding in the phloem, a loud, squeaky noise may be heard. There may be

small amounts of dark, sliver-shaped sawdust being pushed from small holes in the bark. Larvae may be found by peeling the bark from this area. As the larvae enter the sapwood, sawdust being pushed from the hole in the bark may change to a mixed yellow and dark colored sawdust. Chewing sounds can be heard quite distinctly at this time. Bark peeled from the log may expose the irregularly shaped feeding gallery in the phloem and a hole leading into the sapwood.

The tunneling galleries in the sapwood may be as large as 1-inch in diameter and penetrate to the center of the tree, depending on the woodborer species.

Wood boring beetles usually are not a primary agent of tree mortality, but may cause a structural weakness or susceptibility to pathogens such as decay fungi. Lumber products manufactured from infested woodborer material may be structurally weaker than uninfested wood due to the nature of the winding larval galleries in the sapwood.

Control Measures

Mechanical control may be applied by peeling the bark off recently felled logs that are to be used for lumber products or house logs. This will prevent oviposition and remove young larvae under the bark; however, it will not kill larvae once they have entered the sapwood. Peeling of the logs should be done immediately after cutting the tree if the tree is felled in early spring through midsummer, which is the flight period of adult woodborers. Trees felled in late summer should be peeled before the next spring flight period.

Firewood gatherers often express concern about bringing infested firewood to their homes, fearing that the insects will infest building structures and urban or ornamental trees. The chewing noises of woodborers can be quite loud and sound potentially destructive. To oviposit, wood boring beetles need wood that has bark on it; therefore, they cannot infest structures or peeled logs. Once established in suitable habitat, the larvae will not move to other locations. If homeowners have spruce trees on their property that are stressed, weak, diseased, or dying, there may be a potential for borers that emerge in the spring from infested woodpiles to attack the weakened trees. This problem can be alleviated by burning the firewood before the beetles fly in the spring, by keeping yard trees healthy and vigorous through fertilization and watering, and by avoiding physical injury or damage to the tree.

There are contact insecticides that may be applied to the stems of trees to prevent woodborer infestation, but it will not kill woodborers once they have gained entry into the phloem. Check with you local Alaska Cooperative Extension office for insecticides that are currently labeled for prevention of woodborer attack.

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