

# Introduction to Wood Borers

## Bore holes and tunnels into the wood

In general, wood-boring insects (figs. 1-5) feed on a wide variety of stressed, dying, or dead trees. Exceptions include some hardwood borers that attack apparently healthy, live trees and non-native wood borers for which natural enemies or host resistance are missing or absent. Adult wood borers lay eggs in or on a suitable tree, and the eggs hatch into larvae that mine under the bark. Some species will tunnel into the wood of the tree. Once larvae have completed development, new adults will chew an exit hole through the bark and emerge. Wood borers serve an important ecological role in facilitating tree decomposition by the holes and channels they produce in the woody tissue, phloem, and bark and by the decay fungi they bring with them.

### General Features—General features of wood borers:

- Most only attack trees under stress or in decline or those that are dying or dead.
- They develop under the bark and the life cycle is usually 1-3 years; adults occur outside the bark; larvae are found in stems, branches, or major roots.
- Larvae create meandering galleries that are packed with coarse to fine frass and that often obscure galleries made by other insects.
- Cerambycidae form an oval-shaped exit hole, Buprestidae form a D-shaped exit hole, and Siricidae form a round exit hole.
- Some species are very large (wood wasps look like very large wasps) and some have long antennae (longhorned beetles can have antennae longer than their body).
- Holes in the wood caused by wood borers can be a weak point in the tree, leaving the tree prone to wind damage and can reduce the timber value.

**Conifer Borers**—In the Rocky Mountain Region, wood borers found in conifers only attack recently felled trees, dead or dying trees, trees severely stressed by drought, or trees attacked by bark beetles. For this reason, they are not considered a primary cause of tree mortality. Wood borers are often very active after large disturbances such as a fire. Where wood borer populations are high, larvae can be heard chewing under the bark. Some species only mine in the outer layers of the tree, and others mine into the sapwood and heartwood of a tree. The types of hole that wood borers create distinguishes this group from other insects. Different insect families create differently shaped exit holes (see “General Features” above). Most wood borers in conifers are either beetles or wasps (table 1).

**Hardwood Borers**—Wood borers found in hardwoods in this region usually attack trees that are experiencing some form of stress, with the exception of clear-wing moths (Sesiidae), which attack apparently healthy trees. Borers found in hardwoods are problematic because they can be one of the factors leading to tree decline or death. Wood borers may attack hardwoods year after year, and attacks may eventually cause branch death or create a weak point in the tree that is prone to wind breakage. Some hardwood borers like the cottonwood borer develop in roots and can cause severe damage to young trees. Wood borers found in hardwoods can be beetles, moths, or a single wasp species (table 1).



Figure 1. Adult striped ambrosia beetle. Photo: Maja Jurc, University of Ljubljana, Slovenia, Bugwood.org.



Figure 2. Adult cottonwood borer. Photo: Charles T. Bryson, USDA Agricultural Research Service, Bugwood.org.



Figure 3. Adult green flatheaded pine borer. Photo: Sheryl Costello, USDA Forest Service.



Figure 4. Adult clear-wing moth. Photo: James Solomon, USDA Forest Service, Bugwood.org.



Figure 5. Adult wood wasp, pigeon tremex. Photo: Kenneth R. Law, USDA APHIS PPQ, Bugwood.org.

# Introduction to Wood Borers - page 2

Table 1. Common wood-boring insects in the Rocky Mountain Region.

Insect	Family	Host	Signs
<i>Agrilus quercicola</i>	Buprestidae	Oak species, specifically Gambel oak	Wide, meandering galleries under the bark; D-shaped holes in the wood
Alder borer* ( <i>Saperda obliqua</i> )	Cerambycidae	Alder and birch	Oval-shaped holes in the wood
Ambrosia beetles (fig. 1)	Scolytidae, Platypodidae	Most conifers	Fine, white sawdust at base of dead/dying trees
Bronze poplar borer ( <i>Agrilus liragus</i> )	Buprestidae	Aspen	Meandering or zig-zag galleries under bark; D-shaped exit holes
Carpenterworm ( <i>Prionoxystus robiniae</i> )	Cossidae	Certain hardwoods, depending on the region	Sap spots and fine frass mixed with sap
Cottonwood borer (fig. 2) ( <i>Plectrodera scalator</i> )	Cerambycidae	Cottonwood, poplars, and occasionally willows	Found in roots; small seedlings can snap at root collar
Elm borer ( <i>Saperda tridentate</i> )	Cerambycidae	American elm and other elms	Meandering galleries; oval-shaped exit hole
Flatheaded borers (fig. 3)	Buprestidae	Most conifers and hardwoods	Meandering galleries; D-shaped exit hole
Juniper borers	Cerambycidae, Buprestidae	Juniper	Meandering galleries; oval-shaped exit hole
Lilac (Ash) borer (fig. 4) ( <i>Podocesia syringae</i> )	Sesiidae	Ash and lilac	Rough, gouging wounds under bark of large branches and trunk; old pupal skin attached to the tree
Poplar borer ( <i>Saperda calcarata</i> )	Cerambycidae	Aspen; occasionally cottonwood and poplar	Oozing wounds on bark, often associated with some frass; chronic infestations
Roundheaded borers	Cerambycidae	Most conifers and hardwoods	Meandering galleries; oval-shaped exit hole
Pitch moths (discussed in Bud, Shoot, Branch, and Terminal Insects section)	Pyralidae	Pinyon, ponderosa, and other pines, occasionally	Large gouges that ooze light pinkish pitch on trunk and large branches
Wood wasps (fig. 5)	Siricidae	Most conifers and some hardwoods	Meandering galleries; round exit hole

\* Not discussed in this guide.

1. Costello, S.L. 2005. Wood borers in fire-damaged ponderosa pine forests of the Black Hills, South Dakota. Fort Collins, CO: Colorado State University. 71 p. Thesis.
2. Cranshaw, W.S.; Leatherman, D.A.; Jacobi, W.R.; Mannix L. 2000. Insects and diseases of woody plants of the central Rockies. Bulletin 506A. Fort Collins, CO: Colorado State University, Cooperative Extension. 284 p.
3. Furniss, R.L.; Carolin, V.M. 1977. Western forest insects. Misc. Publ. 1339. Washington, DC: U.S. Department of Agriculture, Forest Service. 654 p.