

Spruce Engraver Beetles

Colonizes upper surface of windthrown and weakened trees

Name and Description—*Ips pilifrons* (Swaine), *I. borealis* (Swaine), *I. hunteri* (Swaine), and *I. tridens* (Mannerheim) [Coleoptera: Curculionidae: Scolytinae]

All of the four most common adult spruce engraver beetles are four-spined and have a distinct declivity at the rear of their abdomen with varying numbers of spines along the margins (fig. 1). Adult beetles are shiny, reddish brown to black, and up to approximately $\frac{1}{6}$ inch (4 mm) long, depending on the species.

Ips pilifrons has been reported as the most abundant species of spruce engraver beetles in Colorado.

Hosts—Engelmann and blue and white spruces, depending on the *Ips* species

Life Cycle—Life cycles vary by species, from one to multiple generations per year. Most overwinter beneath the bark or in forest litter as adults. In spring or summer, male beetles fly and initiate attacks on new hosts. They construct a nuptial chamber beneath the bark and attract multiple females. Mated females construct egg galleries and place their eggs along them. Egg galleries radiate away from the nuptial chamber, commonly forming a Y-shaped pattern (exception: *I. hunteri* typically has only two egg galleries, which often radiate away from the nuptial chamber in opposite directions). Adult beetles keep the galleries free of frass/boring dust, a characteristic that distinguishes them from galleries of *Dendroctonus* species, which are tightly packed with frass. Bark beetles in the genus *Ips* are referred to as engravers as their gallery patterns are lightly or sometimes deeply “engraved” into the face of the tree’s sapwood (fig. 2). Larvae feed away from the egg galleries.

Damage—These bark beetles are not known as aggressive tree killers. Their preferred habitat is downed trees and broken branches and tops. However, they do cause some tree mortality among stressed trees but, more commonly, only kill the tops of such trees. Outbreaks in standing, healthy trees are uncommon and short-lived.

Spruce engraver beetles are usually found colonizing the upper surfaces of windthrown trees and broken tops. They are much more tolerant of sun-exposed surfaces than are spruce beetles. Fresh piles of boring dust are key indicators of recent infestation. Pitch tubes may be found on green, standing trees, but they are not always present. If external signs of infestation are present, removing a small section of bark will likely reveal the Y-shaped, frass-free galleries in the inner bark; the same pattern engraved on the face of the sapwood; and possibly various life stages (larvae, pupae, or adults) of the beetles. Once beetles have developed and flown, the outer surface of the bark is peppered with many small, round exit holes.

Engraver beetles are often found in downed spruce in combination with other bark beetles, including spruce beetle, *D. rufipennis*. Spruce engraver beetles often occupy habitat beneath the bark of fallen spruce that might otherwise be used by the more aggressive spruce beetle. This can be significant, as the availability of suitable breeding habitat is the major factor contributing to substantial bark beetle population increase.

Management—Management of spruce engraver beetles in spruce is typically not necessary in general forest settings, although prudent and timely slash management directed at spruce beetle prevention might also serve to

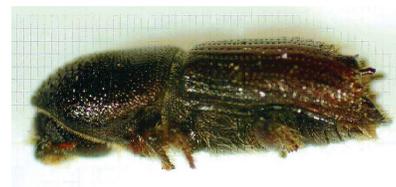


Figure 1. Adult *Ips* beetle. Note the declivity at the rear of the abdomen with spines along each side. These are two characteristics that distinguish members of this genus from those of the genus *Dendroctonus*. Photo: Darren Blackford, USDA Forest Service, Bugwood.org.



Figure 2. *Ips* galleries beneath the bark of spruce. Egg galleries are free of frass. These beetles are called engravers because their galleries are “engraved” into the face of the host’s sapwood. Photo: Whitney Cranshaw, Colorado State University, Bugwood.org.

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reduce spruce engraver beetle populations. Spruce engraver beetle activity can be a periodic problem in high-use recreation areas where spruce are stressed from soil compaction, wounded by human activity, etc. In such settings, timely removal of infested trees (sanitation) is usually sufficient to prevent/avoid other substantial tree mortality. In urban settings, preventive sprays can be used to protect ornamentals from ips attack (e.g., *Ips hunteri* [blue spruce engraver] often colonizes and kills the tops of blue spruce).

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1. Furniss, R.L.; Carolin, V.M. 1977. Western forest insects. Misc. Publ. 1339. Washington, DC: U.S. Department of Agriculture, Forest Service. 654 p.
 2. U.S. Department of Agriculture, Forest Service. January 2000. Ips bark beetle management guide. [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Region. Online: <http://www.fs.fed.us/r2/fhm/bugcrud/silvips.htm>.

