



# Conifer Bark Beetles

## Biology, Symptoms And Management

### FOREST HEALTH FACT SHEET

Wisconsin Department of Natural Resources, Division of Forestry, Forest Health Program, Revised June 2023



**Left:** An adult spruce beetle, *Dendroctonus rufipennis*. **Photo:** Edward Holsten, USDA Forest Service, Bugwood.org. **Right:** An adult red turpentine beetle, *Dendroctonus valens*. **Photo:** Joseph Berger, Bugwood.org.



Red pine trees dying because of bark beetle feeding under the bark. **Photo:** Michael Hillstrom, Wisconsin DNR.



The gallery of an adult two-toothed pine beetle, *Pityogenes bidentatus*. **Photo:** Michael Hillstrom, Wisconsin DNR.

### Locations

Bark beetles are found throughout Wisconsin. Ranges vary with each beetle species and its preferred host tree(s). Common conifer bark beetle species include: pine engraver (*Ips pini*), red turpentine beetle (*Dendroctonus valens*), chestnut-brown bark beetle (*Pityogenes hopkinsi*), spruce beetle (*Dendroctonus rufipennis*), eastern larch beetle (*Dendroctonus simplex*), and balsam fir bark beetle (*Pityokteines sparsus*).

### Impact

Many species of bark beetles attack conifers in Wisconsin. Most prefer to attack only one or a few host species of conifers. Bark beetles can attack trees under stress; stress can be caused by overcrowding, drought, flood, damage from other insects, disease, changes in the water table,

wounds, fire, storm damage and thinning during a drought. Bark beetles may also attack trees that are dying, freshly cut trees and logging debris.

Stressed trees are more vulnerable to bark beetle attack because their defensive mechanisms are compromised. Healthy conifers produce large quantities of pitch that often prevent bark beetle attacks. Occasionally, extremely large populations of bark beetles mount a mass attack that can overwhelm the defenses of healthy trees.

### Biology

Adult beetles emerge in spring after spending the winter in the layer of needles and other debris on top of the soil or from an infested tree. Beetles bore into a tree, mate and lay eggs. Fungi that may impact tree health are sometimes introduced during colonization.



Two *Ips pini* bark beetles in a gallery. **Photo:** Linda Williams, Wisconsin DNR.



Numerous tiny bark beetle exit holes. **Photo:** Michael Hillstrom, Wisconsin DNR.



A pitch tube resulting from an attack by a red turpentine beetle, *Dendroctonus valens*. **Photo:** Michael Hillstrom, Wisconsin DNR.



Woodpeckers remove bark from beetle-infested trees to eat the larvae hiding beneath. **Photo:** Brian Schwingle, Minnesota DNR.



Between March and August, remove harvested pine logs within three weeks to prevent bark beetle infestations. **Photo:** Michael Hillstrom, Wisconsin DNR.

Larvae hatch and feed beneath the bark, creating galleries that disrupt the flow of water and nutrients in the tree.

Some beetle species, such as the pine engraver (*Ips pini*), complete development rapidly (in as little as 30 days) and go through multiple generations per year. Other species, including the spruce beetle (*Dendroctonus rufipennis*), take up to two years to complete their life cycle.

Warmer temperatures allow beetles to develop more quickly; cooler weather will lengthen the cycle. Populations of bark beetles can build up rapidly in hot, dry years.

## Signs And Symptoms

- Individual or groups of trees with light green, straw yellow, red or brown foliage. Brown, dead needles and tree mortality may occur abruptly.
- Small, round exit holes in the bark or pitch tubes near the base of the tree.
- Feeding galleries (tunnels) under the bark.
- Fine dust in bark crevices, at the base of the tree, or on understory plants.

## Prevention

Conduct sustainable forest management activities, such as thinning stands at the proper time to maintain healthy, vigorous trees.

Whenever possible, avoid stressing conifers in multiple ways, such as thinning during a drought. Remove harvested logs within three weeks of being cut during the months of March through August.

## Management

Management strategies will vary depending on the bark beetle species, host species and site conditions.

Recommendations for managing conifer bark beetles may include:

- If trees are stressed from drought, storm damage or disease, consider a pre-salvage harvest.
- Promptly salvage trees that are severely damaged by storms, fire, disease, insects or other destructive agents before bark beetles have a chance to infest them.
- Harvest conifers during winter, or when bark beetles are not active. Remove cut logs and tops down to 2 inches in diameter from the site by March if cut during the winter, or within three weeks of being cut from March through August.
- Logging debris remaining on the site should be left attached to the main stem, scattered into openings, or driven over to break it up and allow faster drying.
- Minimize damage to remaining trees during logging operations. Avoid large wounds, soil compaction and root injury which can stress trees and attract bark beetles.
- Plant site-appropriate conifer species, taking into consideration soil types and other factors that impact tree health and survival.



All photos: Wisconsin DNR unless noted

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