

# Spruce Bark Beetles

## A Guide to Tree Management Options for Home and Woodlot Owners for Southcentral and Interior Alaska

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by Bob Wheeler, Extension Forestry Specialist

*This guide provides a quick reference for commonly asked questions regarding the spruce bark beetle, what you can do to protect healthy unattacked spruce trees, and determining what your options are if your tree is under attack.*

The spruce bark beetle (SBB) has become a very serious cause of tree mortality in the spruce forests of Southcentral Alaska. Although they are present in the Interior, they are less of a threat there. Even though SBB forest mortality declined during 1998 on the Kenai Peninsula, the spruce bark beetle continues to be a threat especially to trees of high value in yards or community settings.

### Does it matter what species of spruce I have on my property?

The spruce bark beetle prefers to feed on white, Lutz spruce (the hybrid cross - Sitka x white) and Sitka spruce but rarely attacks black spruce. The SBB can also attack ornamental blue spruce trees but are not a preferred host. The SBB does not attack any other tree species (hardwoods or conifers) than spruce.

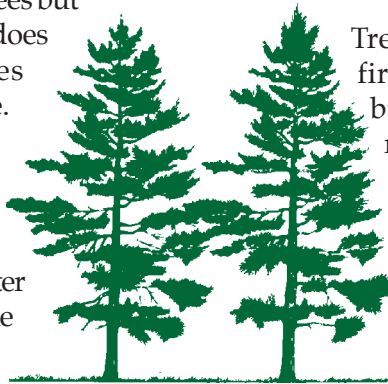
### Does it matter how big my trees are?

The beetles are attracted to trees with diameters above 8 inches but can kill trees down to 4 inches. Large diameter older trees are particularly susceptible especially if they have been stressed by lack of water or mechanical damage to the bark or roots. Overstocked stand trees can be stressed due to competition with other trees for water and nutrients which can result in making them more susceptible to attack.

### How do I determine if my trees have been attacked?

The winged adult SBB emerge from their host tree during early summer usually around the end of May through June. Once they emerge they will attack

other trees in the surrounding area. The beetles prefer to attack the upper roots and lower trunk. Attacked trees will exhibit reddish-brown dust produced by the beetles as they chew entrance holes into the bark. The dust will accumulate on the bark and ground at the base of the tree. Live attacked trees will usually exhibit globules of resin at the site of a SBB entrance hole as the tree attempts to "pitch-out" the attacking beetle. The tree is killed by the beetles as a result of the adults and larvae feeding on the phloem of the tree, a layer of cells just inside the bark. When the phloem layer inside the bark of the tree is effectively girdled, the tree will die.



Trees will typically be killed within the first few weeks of being fatally attacked, but it may take a year or more for the needles to begin turning reddish and fall off. Down trees with bark on them can serve as a host site for the SBB and could lead to further infestation of healthy trees on your property.

Trees that have been killed by the SBB are subject to advancing stem and root rot infection and are subject to being blown over or falling down. The length of time these dead trees have until they fall varies from site to site depending on factors such as ground moisture and wind patterns. Dead trees become an increasing hazard to structures and people, and it is recommended that concerned landowners have their trees examined by a forester or tree care specialist.

## • • • • • Is there anything I can do to protect my trees? • • • • •

*Your control options depend upon whether or not the tree has been attacked.*

First examine your tree(s) to determine if there appears to be any SBB activity as previously described.

### **Does the tree appear to be unattacked?**

The tree has green needles. There is no rust-colored boring dust present on the bark or in the crevices especially at eye-level and below or on the ground at the base of the tree. There are also no rust-colored opaque globules of pitch mixed with the boring dust on the bark especially at eye level or below.

### **Control options: unattacked trees**

#### **1. Maintain health and vigor of trees.**

The spruce bark beetle prefers to attack weaker trees or ones that have fallen down so maintaining the health and vigor of your trees is important. Tree culturing activities such as watering and fertilizing trees early in the growing season will help develop and maintain healthy trees. To help enhance root development and reduce moisture stress, a high phosphorous (8-32-16) fertilizer is recommended at one pound of fertilizer per inch of tree diameter. The fertilizer should be incorporated into the tree root zone and be well watered. Removal of weakened trees and downed trees with bark on them may need to be considered. Downed trees should be split and debarked when they fall if possible and definitely before the mid-May to June flight of the SBB.

#### **2. Be careful about accidentally importing the beetles to your home or lot.**

Bringing firewood or logs to your property may be a source of future infestation. Beetle larvae that are developing under the bark will emerge in the early summer around the end of May and will attack other trees in the immediate area. Removal of the bark and burning it will help ensure limited impact from imported beetles.

#### **3. Do not damage the trees.**

Be careful not to damage the trees on your lot during any construction, landscaping, or tree

management activities since damaged trees are more susceptible to infestation.

#### **4. Thinning may reduce competition for water and nutrients by your desired residual trees.**

Optimum stocking for tree vigor is dependent upon tree species, age and size, and growing site conditions. Select trees for removal based on evidence of physical damage, insect damage, and tree form. Contact the Alaska Division of Forestry or Alaska Cooperative Extension for more information.

#### **5. Prune lower branches for fully crowned trees.**

Pruning should be done in the fall and the branches removed from the site. Research has shown that pruning the lower branches of the tree can reduce the risk of infestation as a result of changing the environmental conditions in this portion of the tree.

#### **6. Spray the tree with an insecticide registered for use on spruce trees to prevent spruce beetle attacks.**

Spray the tree with an insecticide registered for use on spruce trees to prevent SBB attacks. This should be done in spring by early May in order to protect the tree prior to the beetle's emergence and dispersal flight. Currently four pesticides are registered for preventative use against spruce beetles. These pesticides listed as active ingredients on the EPA approved label include carbaryl, permethrin, chlorpyrifos and lindane. These active ingredients may be sold under several trade names for different uses. **Be sure the pesticide you purchase and apply is registered to control spruce bark beetles in conifer trees.**

The spray should be applied to the lower trunk of the tree up to at least 25 feet if possible. Due to the cost of spraying equipment and protective gear, it may be best to consider hiring a qualified pest control operator. Follow all label directions when using any insecticide. Trees may be attacked above the spray line.

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### **Does the tree appear to be attacked?**

See the varying descriptions below.

### **Control options: attacked trees**

#### **Tree has green needles.**

The tree was attacked within the past year, and the severity of the attack will determine whether the tree will live or die. One or a few beetle attack sites on the bark doesn't mean that the tree will die, but an initial attack may mean that the tree will be susceptible to a larger attack the following year. An attacked tree may also serve as an incubation site for further infestation of the area the following year, and a careful assessment of the existing damage and treatment alternatives by a qualified person may be needed. Surviving attacked trees should be cared for to increase their vigor by practices such as watering during the growing season and fertilizing.

If the tree has been heavily attacked it should be removed before the following May in order to prevent further infestation of your surrounding trees. Once the tree is felled, the bark needs to be removed to destroy beetles and larvae in the tree.

After the bark is removed and the beetles and larvae killed, the tree can be used for firewood or may be stored for later use. Firewood with remaining bark should be burned before the following spring. Stumps should not extend above the ground and should be debarked down to 2 inches below the ground.

#### **Tree has faded yellow or bright red needles.**

The tree was attacked last season and will have evidence of SBB adults and larvae under the bark and may exhibit woodpecker activity. These trees are the source of new infestations for the present season and possibly the next since beetles can exhibit either one or 2-year life cycles. Remove a strip of bark from the lower trunk of the tree and determine if beetles and white larvae are present. If larvae are present it will be necessary to remove such trees before May and debark the trees immediately upon felling.

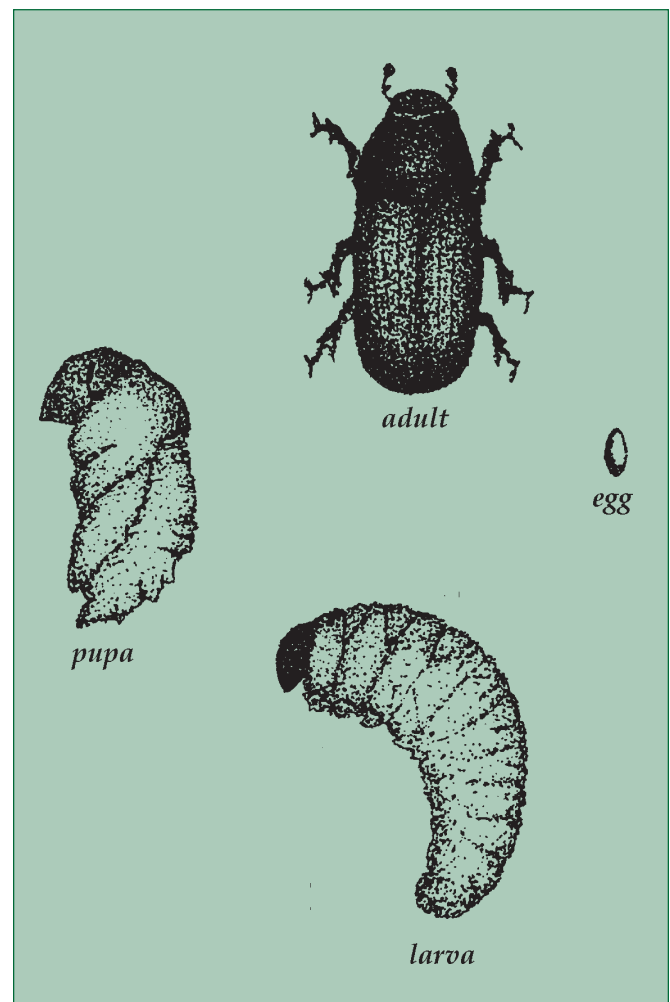
#### **Tree has no needles remaining on twigs.**

The tree was attacked last season or before and exhibits evidence of prior beetle attack and emergence holes. Beetle larvae may not be present although there may be some adults. Large portions of the bark may be removed by woodpecker activity. These trees can serve as host sites for future

infestation when the beetles emerge in mid-May to early June. Remove a section of the bark to determine if the beetles are present. If there are beetles present, fell the tree prior to mid-May and debark the tree immediately upon felling. The wood can then be used for firewood.

#### **Tree has no needles and no twigs remaining/tree color appears silver-gray.**

These trees have been attacked at least three or more seasons ago. They will generally have loose bark with evidence of SBB activity on the undersides of the bark. These trees will have no bark beetles remaining under the bark although other insects and wood decomposers may be present. The landowner may choose to fell the tree for firewood or leave the tree standing for wildlife habitat. Depending on soil moisture, the presence of root rot, and wind patterns these trees may have only five or more years before they will be at risk of falling down. If they may endanger people or property they should be removed.



*Life cycle of the spruce bark beetle.*

• • • • • Is there anything I can do to prevent future • • • • •  
outbreaks of bark beetles on my property?

Landowners should consider that a mixture of native tree species is your best approach to providing a healthy and insect resistant forest area. Numerous larger diameter spruce trees provide an ideal habitat for the spruce bark beetle. Landowners should be cautious about leaving fresh spruce firewood on their property. Spruce firewood with bark can serve to either bring beetles onto your property if the wood is infested or can serve as a

host site for further infestation and increase the SBB population on your property.

For more information, contact your your local Alaska Cooperative Extension District Office or Dr. Bob Wheeler, Forestry Specialist, Alaska Cooperative Extension, P.O. Box 756180, University of Alaska Fairbanks, Fairbanks, AK 99775-6180.

Visit the Alaska Cooperative Extension Web site at  
[www.uaf.edu/coop-ext](http://www.uaf.edu/coop-ext)

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