



A Guide to Managing Douglas-fir Beetles on Private Property in B.C.'s Coastal Region

FACTS ABOUT THE DOUGLAS-FIR BEETLE

The Douglas-fir beetle (*Dendroctonus pseudotsugae*) is one of several native bark beetles that attack susceptible conifer hosts throughout British Columbia. This beetle can infest and kill Douglas-fir trees throughout its range and normally attacks small groups of susceptible trees. Periodically, local beetle populations can rise to epidemic levels and as a result, large numbers of trees can be attacked simultaneously over a large area during significant outbreaks. Douglas-fir beetle populations are currently at low levels in the province's coastal region.

Douglas-fir beetles prefer to attack trees that:

- » are mature or have a large diameter (i.e., veterans)
- » have recently fallen or been blown down in storms (blowdown trees)
- » have been injured (e.g. by fire or by machine damage)
- » are stressed (e.g. by defoliation, root disease or drought)

Douglas-fir beetles usually prefer to attack trees with a diameter over 20 cm, but they will attack smaller trees when beetle populations are high. They are also attracted to fresh stumps and slash piles.

Learn more about Douglas-fir trees and how to identify them at: <http://ow.ly/JYg030n2qkR>



Figure 1: Adult Douglas-fir beetles are dark brown and black, and are 4.5 mm to 7 mm long.



Figure 2: Douglas-fir beetle larvae

IDENTIFYING A “CURRENT” DOUGLAS-FIR BEETLE ATTACK

Douglas-fir beetles tend to attack trees early in the spring, often starting soon after snow melt. The period for attack varies, but it usually continues into mid-summer on the coast. Several months after Douglas-fir beetles infest a tree (referred to as “current” attack), the tree’s foliage becomes discoloured (Figure 3).

On the coast, the needles typically turn red and then a dark rust colour, beginning as early as June or July and continuing through the summer. A pale green or yellow colour may indicate that a tree is currently under attack, whereas red to dark brown foliage indicates that the attack is one to two years old. A grey colour indicates that the attack is older than two years and beetles are no longer attacking the tree.

The time of year when foliage discolouration becomes noticeable varies with the tree’s location, the date of the initial attack, the intensity of the infestation, elevation and seasonal weather.

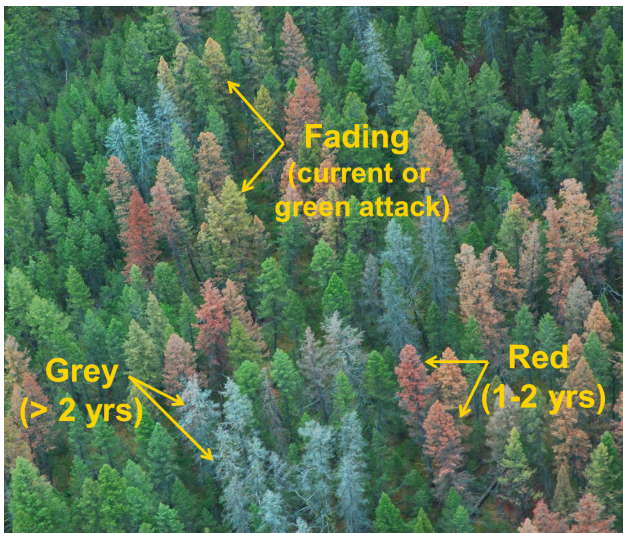


Figure 3: When Douglas-fir beetles attack, the needles of affected trees change colour in stages.

A Douglas-fir tree that is experiencing a current attack may maintain a green, healthy-looking crown for many months, but it’s important to understand that beetles may be continuing their life cycle under the bark and may emerge the following year to infest nearby trees.

If you see a pale green, yellow, red, brown or grey Douglas-fir tree on or near your property, check the surrounding trees to determine if they have also been infested with Douglas-fir beetles. Attacks frequently occur well above eye level, so you must examine the tree trunks carefully to determine if beetles are present. It is important to note that not all beetle attacks are successful, especially in living trees.

EXTERNAL SIGNS AND SYMPTOMS OF A DOUGLAS-FIR BEETLE ATTACK

Signs and symptoms to look for to determine whether Douglas-fir beetles have attacked a tree include:

- » The tree has red foliage or a thinning, pale green crown (Figure 3).
- » Red-orange “frass” (fine sawdust) appears on the tree’s bark (Figure 4). Note that wind or rain may displace some of the frass, which can make it harder to spot on the bark’s surface. Look for frass all around the tree trunk at eye level and above.
- » An excessive amount of fresh sap is running down the tree trunk (Figure 5).
- » Woodpeckers have been recently feeding up and down the tree trunk (Figure 6).



Figure 4: Frass (fine sawdust) on a tree trunk, an indication that beetles have bored into the tree

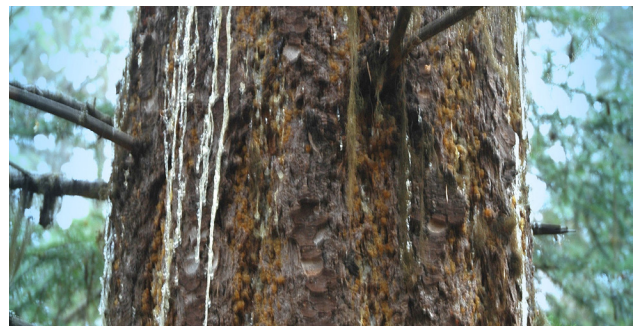


Figure 5: Sap streaming on the mid-bole or upper bole of a Douglas-fir tree that has been attacked



Figure 6: Damage caused by woodpeckers feeding on beetles in a fire-damaged Douglas-fir tree

INTERNAL SIGNS AND SYMPTOMS OF A DOUGLAS-FIR BEETLE ATTACK

- » Beetle galleries (the shallow tunnels that beetles create while feeding) are etched into the underside of the bark (*Figure 7*).
- » Live beetles or larvae are present (*Figure 1 and Figure 2*). If it's cold out and you're not sure if an adult beetle is alive, warm it up in your palm to see if it starts wriggling. You could also try the "squish test". A dead beetle will be dry and crumbly.
- » The cambium (the layer of tissue between the bark and the wood) may be brown and crumbly (*Figure 8*). The cambium of a tree that has only been partially attacked will be pink (i.e., where the flow of the tree's sap successfully dislodged the beetles). Carefully use an axe to peel back a small section of bark to determine if the cambium is alive or dead.



Figure 7: Douglas-fir beetle gallery under the bark



Figure 8: Brown cambium on a tree that's been attacked (left) and pink cambium on a healthy tree (right)

REMOVING DOUGLAS-FIR TREES THAT ARE UNDER CURRENT ATTACK

If you confirm that infested Douglas-fir trees are on your property, the best way to stop the beetles from spreading is to remove the infested trees before the beetles emerge in the spring. At lower elevations, this usually means no later than the first week of April. After the attacked trees have been identified and marked for removal, please follow the guidelines below:

- » Cut down the trees in a way that does not allow them to fall against or damage nearby healthy trees, since the resulting injuries could attract beetles the following year.
- » To avoid damage to healthy trees, hire experienced fallers and only use small, easily maneuverable equipment to extract the cut trees.
- » Keep the height of stumps as low as possible (ideally, less than 30 cm above ground level).
- » Remove or destroy all infested trees (felled and blowdown trees) from the property **before** the annual beetle flight occurs in the spring (typically in early to mid-April).
- » Burn or chip all debris piles completely **before** the annual beetle flight occurs in the spring (typically in early to mid-April).
- » Remove, peel or burn all pieces of wood debris with a diameter greater than 20 cm or a length greater than one metre. When the bark is peeled off logs, the adult beetles, larvae and pupae are exposed to the weather and predators, which usually kill or eat them.
- » Before lighting any open fire, visit the BC Wildfire Service website for information about open burning, burn categories and current fire bans: <http://ow.ly/PLzG30n1IHQ>
- » Burn piles should be located in clearings to ensure that any nearby trees are not scorched or scarred. The bark of young trees is not as thick as that of mature trees, so younger trees can be easily damaged. Fire injury to any tree significantly increases the risk of attack by bark beetles.
- » If you want to use the infested trees for firewood, peel off all the bark and leave the cut wood exposed to kill the beetles. Douglas-fir beetles can survive in wood that has been sheltered from the elements and they could emerge to attack nearby trees the following spring.
- » Remove the bark from any stumps higher than 30 cm.
- » Nearby healthy trees should be monitored the following spring and summer. Any newly infested trees should be removed.

REMEDIAL MEASURES

Anti-aggregation pheromones can successfully repel Douglas-fir beetles from vulnerable areas and can be used to help protect small, high-value stands of trees in or near parks, protected areas, campgrounds, residential properties or old growth management areas.

The anti-aggregative pheromone MCH (*methylcyclohexenone*) is used to disrupt or prevent beetle attacks. Through the application of this pheromone, Douglas-fir beetle attacks have been reduced by over 90% in some cases.

This pheromone is most effective when the number of infested trees or susceptible trees is low and it's applied before the annual beetle flight occurs (typically in early to mid-April) on: blowdown trees; large, susceptible trees (veterans); and damaged or severely stressed trees (e.g. with thin foliage in the tree's crown due to other pests or drought).

To find out if MCH is an appropriate tool to use on your property and to learn how to use it correctly, please contact one of our specialists in your area.

FOR MORE INFORMATION

For additional details, please contact one of the following:

- » FrontCounter BC
Ph: [250 398-4574](tel:2503984574)
Toll-free: [1 877 855-3222](tel:18778553222)
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