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Diseases and Insect Pests in our Local Forests



Discolored foliage is a sign that these lodgepole pines have been attacked and killed by the mountain pine beetle.

Pine trees are dying by the thousands in the American West. Responsible for this devastation is a small insect known as the **mountain pine beetle**. This beetle burrows into tree phloem, the inner bark tissue, and lays its eggs. Larvae hatch from the eggs, and tunnel throughout the phloem, essentially girdling the tree and killing it. The vast majority of trees victimized by the mountain pine beetle are lodgepole pine trees, large stands of which cover the landscape here and in other parts of the West from mid to upper elevations, especially in old burn areas. Eastbound travelers cresting Sherman Pass and entering an area burned by the Dollar Mountain Fire in the 1920s will see many of these red, brown and grey dying and dead trees.

Do I Need to Worry about my Trees?

Should forest landowners be fearful that their trees are in danger of succumbing to the same epidemic affecting the lodgepole pine? For the most part, the answer is no. At lower elevations, where most private forests are found, stands of lodgepole are rare. The dominant conifer species in western Ferry County valleys are western larch, Douglas-fir and ponderosa pine. While not threatened with mass devastation as is the lodgepole, each of these trees does, however, have its own issues with disease and pests.

Ponderosa pine

Recently in our area, more ponderosa pine trees are dying, probably from damage caused by one of several bark beetles. The **mountain pine beetle**, the same insect killing lodgepole pines at higher elevation, may damage a stand of densely growing ponderosa. Larger, older and more stressed ponderosa pines are somewhat susceptible to infestation by another beetle, the **western pine beetle**. While both of these beetles may kill the ponderosa by girdling it, the devastation is unlikely to come close to the widespread damage wreaked on the lodgepole pine trees higher up.



Frass or boring dust (looks like sawdust) in bark and at base of tree is an indicator of bark beetle presence.



*Evidence of western pine beetle and pine engraver (*ips pini*) includes small entry holes in bark.*



Foliage (entire branch or entire tree) turning brown. Dead top of larger diameter pine indicates Ips beetle. Increased woodpecker activity may indicate beetle infestation

Another threat to local ponderosa pine is the **pine engraver** or **Ips beetle**, a bark beetle which infests small trees or the tops of larger ones. The Ips beetle is dependent on slash left behind from logging or winter storms. Slash over 4" in diameter created during the winter and spring provides an attractive home for the beetles which lay many eggs resulting in large population increases. This next generation matures within several months or weeks and can then infest nearby living trees, especially those stressed by drought or competition (dense stands). Like other bark beetles, the larvae feast on the phloem layer within the bark, girdling and killing the tree. At summer's end, the last generation of the year shelters



Fresh slash provides a home for Ips beetles in winter and spring. Don't leave storm and logging debris (greater than 4" diameter) on the ground between January 1 and July 15.

in the forest duff. Few survive the winter unless new slash becomes available to extend the cycle.

The best way for a landowner to avoid infestation by the Ips beetle is to make sure that slash (with diameter of more than 4") is not generated and left available to the beetles between January 1 and July 15. Slash generated before or after those dates will be too dry to appeal to the beetles by the time they are looking for places to lay their eggs.

Pine needle blight or needle cast is a fungal infestation which kills one-year-old needles on ponderosa pines. Though this may cause mild panic when a landowner sees pine trees turning brown in April, it will not kill the tree. When new needles appear on the branch tips in May, the tree will become green again.

Forest landowners may notice some brown needles on pines from needle blight (photo) in spring or normal annual needle loss in autumn. There is little cause for panic.



Ponderosas are evergreens, but this does not mean that the needles on the tree stay green throughout the tree's lifetime. Rather, it means that a tree is always mostly green. Needles are recycled periodically. In autumn, landowners may see some of the oldest needles on their pines, located closest to the trunk, turning brown. This is a natural process. More drop off in drought years. New needles sprout from buds on the branch tips each year.

Douglas fir

Currently, the most prevalent bark beetle issues occurring locally in Douglas firs are caused by the **Douglas fir engraver beetle** or the **Douglas fir pole beetle**. These beetles are usually secondary, occurring in association with other stresses. In our area, several years of drought have created the right

conditions for these beetles to flourish. Piles of logging slash can exacerbate the conditions for these two beetles. Look for mortality of smaller trees and top-kill or branch-kill in larger trees.

Douglas-fir can also be threatened by the **Douglas fir bark beetle**. Like other bark beetles, the adults bore into the bark of the tree and the ravenous larvae girdle the tree and kill it. These insects often show a pulse in their population after a wind storm or a snow breakage event. Similar to *Ips* beetles, Douglas-fir beetles find the downed material to be perfect for infestation and raise a big population that can then move to nearby live, standing Doug firs in subsequent years when the fallen or broken material has been depleted or dried out. They primarily seek trees over 14" DBH. (Another lesser concern is that these beetles may move in to take advantage of weak trees injured by fire.)

Western larch

Western larch is probably the most disease and pest resistant of the three common conifers. Just the same, there are some foliage pests which may affect them. The **larch needle cast** is a fungus, which attacks and kills the early foliage. The host tree may take on a "fall color" in May or June, but most likely will produce a new flush of



Larch needle cast-infected needles remain attached after infected needles are shed on young larch.

replacement needles. The **larch casebearer** is a tiny moth whose larvae eat their way inside larch needles in early spring. After the feeding produces a



Adult Larch moth. When the larvae emerge from their eggs, they bore directly into the needles of the western larch.

similar fall appearance as the needle cast, the tree is normally able to produce a second flush of needles. In the unlikely event of five or more years of defoliation by either needle casts or casebearer insects, the tree may become weak and extremely vulnerable to other pests and disease.



Grand fir on the east side of the Kettle Crest infested with fir engraver will exhibit this distinctive transverse egg gallery pattern.

Grand fir

The fir engraver beetle (*Scolytus ventralis*) has been increasingly affecting Grand fir trees on the east side of Ferry County and in the Wedge in Stevens County (Grand fir is rarely found on the west side of the Kettle Crest). Unlike other bark

beetles, the fir engraver can reproduce without completely killing its host tree. Therefore, symptoms may include dead branches or top kill. Mortality is more likely to occur in combination with other stresses, such as drought, defoliation or root rot. While healthier trees may survive beetle infestation, damage may reduce market value of the timber. The fir engraver beetle produces a distinctive transverse (perpendicular to the grain) egg gallery pattern.

Root Disease



Large structural roots of downed trees may be partially or totally decayed leaving a "root ball."

Root disease is probably the most serious threat facing a small forest landowner. Of the three common conifers, Douglas-fir is the most susceptible to root disease.



In a tree with root rot decayed wood may separate at the annual rings like the pages of a book.

The most prevalent root disease in our area is **armillaria**, followed by **annosus** and then **laminated**. All are caused by pathogens in the

soil and can cause damage to an entire stand of trees. Though there is no easy way to get rid of these pathogens completely, the best strategy in the event of such an outbreak is to remove the susceptible trees and replace them with trees more resistant to the pathogen.

What can be done?

A century of fire suppression and past logging methods have tended to leave us with a predominance of crowded Douglas-fir trees, somewhat more susceptible to insects and disease. A good long-term forest management goal for our area would be to get back to stands with more Ponderosa pine and western larch.

What is the takeaway from all of this for forest landowners? While long-term management practices (including fire suppression) and drought have indeed put forests at a higher risk, it is important not to panic. With the exception of root rot, most of these pests and diseases are probably not going to inflict serious damage to stands of low elevation timber. Though there are not many effective treatments, preventative measures can be taken to protect trees. The most effective of these is to thin overstocked stands of young trees, decreasing competition for sunlight, nutrients and moisture, improving the overall health and vitality of trees and making the trees less susceptible to infestation by disease or insects and better prepared to face wildfire.

For more information on tree diseases and pests and the technical and cost-share assistance that is available to private landowners for forest treatment, visit the Washington Department of Natural Resources (DNR) website: <http://www.dnr.wa.gov/ForestHealth>. DNR's *Forest Health Highlights in Washington – 2018*, with more in-depth information about insect and disease activity and monitoring, can be found online at https://www.dnr.wa.gov/publications/rp_2018_forest_health_highlights.pdf. The Natural Resources Conservation Service also offers technical and cost-share assistance for private forest thinning and pruning (applications are now being accepted for 2020 implementation.) Call 509-685-0937 for information.

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