MAJOR INSECT PESTS OF OREGON CONIFERS

Oregon tree ID: *http://oregonstate.edu/trees/name_common.html*

Douglas-fir	True fir	Pine	Hemlock	Spruce	'Cedars'	Larch
• Doug-fir beetle • Doug-fir pole and engraver beetles* • Flatheaded fir borer • Doug-fir tussock moth • Western spruce budworm • Cooley spruce gall	• Fir engraver • Doug-fir tussock moth • Western spruce budworm • Balsam woolly adelgid	• *Ips* beetles (pine engraver & California 5-spined) • Mountain pine beetle • Western pine beetle (ponderosa only) • Pine butterfly • Black pineleaf scale • Sequoia pitch moth	• Western hemlock looper	• Spruce beetle • Spruce aphid • Cooley spruce gall • Western spruce budworm	• Cedar bark beetles* • Amethyst borer* • Western cedar borer*	• Larch casebearer

*secondary or aesthetic pest only

Oregon Department of Forestry Forest Health: http://tinyurl.com/odf-foresthealth

March 2019

ODF FOREST PEST INSECT SUMMARY

BARK BEETLES

Signs/Symptoms: Brown frass (boring dust), pitch streams/tubes, galleries under bark, no holes in wood, wood staining, woodpecker-flecked bark, 1-2mm round exit holes through bark only (not in wood)
Biology: Many start flying in April into June, development is 2 months for *Ips* and 1 year for most of the other pest species, adults burrow under bark (not into wood) and make distinct galleries, their galleries girdle vascular tissues and they vector staining fungus that clogs these tissues, they use chemical communication to mass-attack trees.
General management: Most bark beetles are attacking trees stressed by competition or lack of resources such as water and sunlight or damage from weather, mechanical injury, fire, root disease or are growing on inadequate sites. Removing these stressors, particularly those that affect moisture levels, improves tree vigor and their ability to defend against these beetles with pitch.
Species of concern: Doug-fir beetle (large diameter Doug-fir), fir engraver (true fir), *Ips* (small diameter pine), mountain pine beetle (pine), western pine beetle (ponderosa pine)

WOODBORERS

Includes: Roundheads (longhorned beetles), flatheads (metallic woodborers), ambrosia beetles, woodwasps/horntails, and moth caterpillars
Signs/Symptoms: White frass, holes in wood (for most), larger round or oval exit holes (but ambrosia holes are 1mm), wood staining (ambrosia), deeper woodpecker holes
Biology: adults lay eggs on the exterior of the tree and hatching larvae burrow into the bark then eventually into the wood, most are secondary insects that attack already dead and dying trees that have already been damaged by bark beetles, fire, etc. Native flatheaded fir borer and bronze birch borer, and non-natives that have not yet been found in Oregon (emerald ash borer and Asian longhorned beetle) are primary tree killers. Ambrosia beetles do not feed on wood but instead feed on fungi they cultivate in their galleries. Native ambrosia beetles do not kill trees but may reduce timber merchantability.
Species of concern: flatheaded fir borer (Doug-fir), bronze birch borer (birch), ambrosia beetles (conifer and deciduous)

DEFOLIATORS

Includes: Moth and butterfly caterpillars, sawfly larvae, leaf beetle larvae and adults
Signs/Symptoms: Leaves/needles fully or partially consummed, webbing and frass may be present
Biology: The more common forest defoliators in Oregon have a 1 year life cycle (2 years for Pandora moth). Some make webs or tents and others may mine into leaf material. Outbreaks can be cyclical and often collapse on their own due to natural controls. Deciduous trees are less impacted by defoliation than conifer trees.
Species of concern: Doug-fir tussock moth and western spruce budworm (Doug-fir and true firs in eastern Oregon), pine butterfly (pine), pandora moth (pine in central Oregon), larch casebearer (western larch), western tent caterpillar and fall webworm (alder and other deciduous).

SAP-SUCKING INSECTS

Includes: Aphids, adelgids, scale insects
Signs/Symptoms: Yellowing foliage, needle loss, distorted branch growth, galls
Biology: Many of these insects have a 'crawler' stage that eventually 'settles' to become stationary and covered in white 'wool' or a 'shell'. Because of their limited mobility they can be chronic pests of an area. They feed on phloem in foliage which removes nutrients from the tree and causes foliage loss.
Species of concern: Balsam woolly adelgid (true fir), spruce aphid (Sitka spruce), black pineleaf scale (pine)

INSECT PEST DIAGNOSTIC GUIDE

ABIOTIC DAMAGE

Often abiotic damage from drought, fire, storms, root compaction, etc. are primary stressors and insects attack these stressed trees. Symptoms include thin crowns, stress cones, branch flagging, etc.

DOUGLAS-FIR

Doug-fir beetle (>8" diameter)

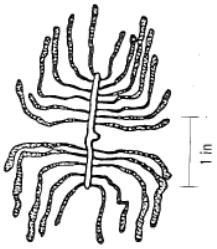
Streaming pitch

Brown frass

12-25cm gallery (alternating clusters of side channels)

4-7mm adult

Doug-fir pole & engraver beetles (small diameter) **not a major pest*



3-8cm gallery (no alternating lateral clusters)

Flatheaded fir borer

Pitch 'pearls'

Consumed cambium

7-11mm adult (6 spots)

Woodpecker flecking

Flagging

Oregon Department of Forestry Forest Health: http://tinyurl.com/odf-foresthealth

March 2019

INSECT PEST DIAGNOSTIC GUIDE

DOUGLAS-FIR cont.

Doug-fir tussock moth (east of Cascades)

Egg mass (covered in hairs) | **Larva** (bunched hairs) | **2.5cm ♂, wingless ♀** (russet hind wings) | **Defoliation** | **Webbing**

W. spruce budworm (east of Cascades)

Larva | **2.5cm adult** | **Webbing and frass** | **Defoliation**

TRUE FIR

Fir engraver

5-15cm gallery (horizontal main line) | **Topkill** | **Wood defect** | **4mm adult** (body shorter than wing cover)

Balsam woolly adelgid

Black 'crawlers' (immature stage) | **White 'wool' covered adults** | **Galls** | **Misshaped crown**

Doug-fir tussock moth & W. spruce budworm (see Doug-fir section) are also true fir pests

Oregon Department of Forestry Forest Health: http://tinyurl.com/odf-foresthealth

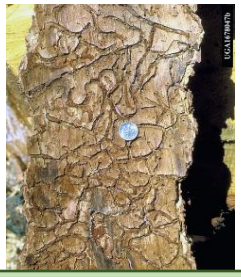
INSECT PEST DIAGNOSTIC GUIDE

PINE

Ips beetles

Brown frass	Tiny pitch tube (rare)	Topkill	'X' or 'Y' shaped gallery	3-5mm adult (spines at rear)

Western pine beetle (ponderosa only)

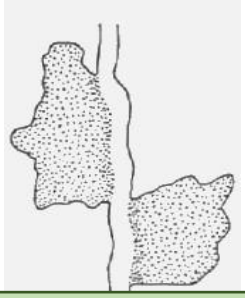


<6.5mm pitch tubes	Meandering galleries	3-5mm adult	Woodpecker flecking

Mountain pine beetle

13-25mm pitch tubes	Gallery (J-crook at bottom)	Widespread mortality possible	4-7mm adult

Red turpentine beetle
**not a major pest*



5cm pitch tube & Grape-Nuts like frass	Open gallery	8mm adult

Oregon Department of Forestry Forest Health: http://tinyurl.com/odf-foresthealth

March 2019

INSECT PEST DIAGNOSTIC GUIDE

PINE cont.

Black pineleaf scale

Tiny black adults

Yellowing foliage

Lion's tail branches
(older needles missing)

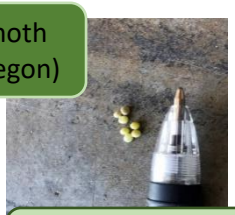
Pine butterfly (east of the Cascades)

Green and white larva

<5cm adult wingspan

Defoliation

Pandora moth (central Oregon)



Yellow eggs

up to 5-7cm long larva

Pupae buried in soil

7-12cm adults
(pink hind wings)

Sequoia pitch moth
**not a major pest*

up to 2.5cm larva

4.5cm wasp-like adult

5-10cm pitch masses