

Native Conifers of Washington State- A summary of field identification traits

Pinaceae family: Northern hemisphere world-wide distribution. 6 genera and 37 species in western U.S. Typically evergreen with linear leaves (needles) and diagnostic seed cones. Includes firs, larches, spruces, pines, Douglas-firs, and hemlocks.

Pines (*Pinus* genus): Evergreen trees with needles (leaves) that live for 2-8 years. Needles are clustered in bundles of 2, 3, 4, or 5 and bound by a papery sheath (fascicle). Fruits are woody scaly cones, with spirally arranged scales, that mature in 2-3 years. Most pines have seeds with a thin papery wing attached at one end. Most pines have a single stem (trunk), but some are multi-stemmed. Mature bark often divided into plates. Conical or cylindrical crowns.

Hard pines: Needles in bundles of 2-3 with a permanent papery sheath wrapped around the base; cross-section of needle has at least 1 curved semicircular side and has 2 “veins” (bundles of vascular tissue)

Ponderosa pine (*Pinus ponderosa*).

- Needles: clusters of 3 (East of Continental Divide, mostly clusters of 2) 5-11 inches long
- Buds: New growing tips of branches protected with a tuft of long needles
- Bark: On mature trees, orange/brown/cinnamon-red, deep, dark furrows, and broken up in to plates (puzzle piece shape)
- Cones: 3-6 inches long, scale armed with a sharp prickle that sticks out, egg-shaped, brown
- Form: broad open crown with regular whorls of long, well separated branches
- Unique identifier: Longest needled pine in WA; bark smells like vanilla. Best adapted conifer to warm, dry habitats. Lower branches naturally die and drop forming a tall bare trunk.

Lodgepole pine (*Pinus contorta* ssp. *contorta*) Other WA subspecies: shore pine (ssp. *contorta*)

- Needles: clusters of 2; 2-3 inches long. Yellow-green, often twisted, and prickly at tip
- Buds: New growing tips are oval.
- Bark: On mature trees, red-brown to nearly black, covered with loosely attached scales.
- Cones: 1-2.5" inches long. Tips of cone scales have small prickles. Variable asymmetrical shape. Unopened closed cones remain for tree for several years. A percentage of cones termed “seratinous” as they remain closed, sealed in resin, awaiting a forest fire to trigger opening and seed dispersal over the newly burned, bare ground.
- Form: Tall, evenly tapering, long narrow crown. Often grows in dense stands.
- Unique identifier: Needles in clustered of 2; unopened cones remain on branches for years.

Soft pines: Needles in bundles of 5 with a papery sheath wrapped around the base that is shed once needles are full grown; cross-section of needle is triangular and has one “vein” (bundles of vascular tissue).

Western white pine (*Pinus monticola*)

- Needles: clusters of 5; 2-4 inches long. bluish-green, underside with a faint line down midrib
- Buds: New growing tips cylindrical with rounded tips.

- Bark: Young bark is smooth and gray. On mature trees, breaks into dark gray rectangular plates in a checkerboard type pattern.
- Cones: 5-8 inches long, flexible, recurved, hanging pendent from high branch tips. Unarmed scales. Cones coated with sticky resin.
- Form: large tree with open pyramidal top. Branches extend in uniform whorls with foliage concentrated toward end of branches.
- Unique identifier: When a needle is pulled downward between 2 fingers, small prickles are detected (differs from our other 5-needed whitebark pine)

Whitebark pine (*Pinus albicaulis*)

- Needles: clusters of 5 1.5-3.5 inches long. Stout and rigid with white stomatal bloom on all sides.
- Buds: New growing tips are cinnamon brown with long oval sharp tips.
- Bark: On mature trees, white-gray to white-brown with thinly furrowed divisions of bark.
- Cones: rounded, Purple to brown, 2-3 inches long, with thick scales. Ripe cones Remain unopened and closed on the tree, awaiting a Clark's nutcracker to dismantle the scales, harvest the seeds, and cache them in 1-inch deep holes.
- Form; A timberline species, often wind-shaped and stunted. Branches are flexible.
- Unique identifier: Tied to subalpine habitat, so rarely grows side-by-side with our other 5-needed pine. When a needle is pulled downward between 2 fingers, it is very smooth (differs from our other 5-needed western white pine)

Larch (*Larix*): Also called tamaracks. Deciduous; all needles lost in the fall.

Light green needles grow out of short spur-like woody shoots in brush-like bundles with 12-40 needles/bundle. Needles do grow singly on the leading branch shoot tip. Cones mature in one season, scales open, and winged seeds are spread by the wind. Open sparse crowns.

Western larch (*Larix occidentalis*)

- Needles: Deciduous, turning golden in the fall; clusters on short woody spurs. 1-1.5 inches long. Light green, fine tipped, and soft.
- Bark: When young, reddish-brown and smooth. On mature trees, scaly brown and deeply furrowed, broken into irregular scaly plates.
- Cones: inches long, Arranged around the stem at various angles
- Form; Large tree with a narrow pyramid-shaped crown.
- Unique identifier to separate it from alpine larch: No wooly cluster of hairs at base of new growth on branch; cones growing out of all sides of branch. Typically found at elevations below 5000' in Cascade eastside. Cones extend out in all directions from branch.

Alpine (subalpine, Lyall's) Larch (*Larix lyalli*)

- Needles: Deciduous, turning golden in the fall; clusters on short woody spurs. 1.0-1.5 inches long. Bluish-green, in bundles of 30-40 needles.
- Bark: When young, smooth and gray. On mature trees, brown and scaly with shallow furrows and loose and scaly plates.
- Cones: Usually sit upright on branch; Reddish when young, turn purple when ripe. 1.5-2.5 inches long.
- Form; A timberline species so form varies from upright to stunted.

- Unique identifier to separate it from western larch: Found at 5000' feet or higher on eastside of Cascades. The current year's new growth of branches and needles has dense white wooly hairs around the twig. Most cones sit upward on branch.

Spruce (Picea genus) Evergreen with spire-like conical crown. Single sharp-tipped needles have a peg-like base attached in a radial pattern around the branch. Long, oval seed cones hang down from branch. Stems are rough with projecting woody leaf bases. Mature bark is scaly.

Engelmann spruce (Picea engelmannii)

- Needles: Scattered singly all around the branch, leaving a woody base when falls from branch. 1 inch long, sharp tipped, and 4-sided. In cross-section, forms a square. All sides have white stomatal stripes.
- Bark: On mature trees, thin, red-brown, broken into loosely attached, circular scales. Under the plates, color is purple to reddish brown.
- Cones: 1-2 inches long with flexible, papery scales with irregular ragged tips.
- Form: Large tree with a narrow pyramidal crown.
- Unique identifier: Sharp (pointed tips), short, square, needles. Leave a woody base on the twig when fall off. Bark breaks into loose scales.

Sitka spruce (Picea sitchensis) unique identifier to separate it from Engelmann spruce: Restricted to within 20 miles of WA coast, with no over-lapping occurrence. It is the only spruce with a non-square needle cross-section. And, the tips of the needles are extremely sharp-tipped, compared to Engelmann spruce. Only the lower side of the needle has white stomatal bands.

False-hemlock (Pseudotsuga genus) Evergreen and have caused confusion as they have characteristics like firs and hemlocks. Have dense, soft, flat blunt-tipped leaves attached by a distinct stem, spirally around the branch. Seed cones hang singly with distinct bracts protruding out from the cone scales. 2 species in Western N. America & 4 Asian species.

Douglas-fir (Pseudotsuga menziesii var. menziesii)

- Needles: Scattered singly over the twigs 0.6-1 inch long. Underside has 2 white stomatal bands. Grow radially around the stem; are soft to touch. Attached to branch with a twisted stem.
- Buds: New growing tips are very sharp tipped and shiny- look like a spear.
- Bark: Dark gray to brown: smooth on young trees, often with resin blisters. On mature trees, thick, reddish-brown with deep furrows and corky layers.
- Cones: 2-4 inches long. Scales are soft with a distinct 3-lobed bract extending from and beyond each scale (Looks like the rear end of a mouse, diving for cover).
- Form: Large tree with a narrow flat-topped crown.
- Unique identifier: Spear-like bud tip, mouse-tail cone bract.

Hemlocks (*Tsuga* genus) Evergreen tree with a drooping leader (top) and branches. Needles are single, arranged spirally on branch, and twisted to appear laying flat. Mature bark has ridges with linear furrows. Seed cones hang in bunches. 2 species in Western N. American

Western Hemlock (*Tsuga heterophylla*)

- Needles: 2 ranked, splaying out from the branch at various angles, some shorter than others. 0.2-1 inch long. Dark green above, light green below with distinct white stomatal bands.
- Buds: Rounded, light brown new growing tips.
- Bark: Thin, with linear furrows, divided into broad flat ridges with scales. Dark brown, tinged with red.
- Cones: <1 inch long, egg-shaped with thin scales. Green, ripening to brown. Hang down in clusters from branch tip.
- Form: Large tree with a narrow conical crown and droopy top leader.
- Unique identifier to separate it from mountain hemlock: bent-over leader, drooping branch tips, abundant small cones, and short delicate needles. Branches have a delicate, spray-like appearance. Found: sea level – 5000 ft. (Does overlap in mountain hemlock). Needles are two-ranked (instead of radial) on the branch and more yellow-green in color.

Mountain hemlock (*Tsuga mertensiana*)

- Needles: Scattered singly, spirally arranged, projecting from all sides the branch. 0.5-1 inch long. Blue-green, bluntly rounded, grooved above with inconspicuous white stomatal bands on both sides of needle.
- Buds: Sharp-pointed, brown new growing tips
- Bark: On mature trees, dark red-brown, deeply divided by round scaly ridges.
- Cones: 1-3 inches long (much longer than western hemlock), pendant, green ripening to brown.
- Form: bushy foliage, irregular canopy, & slightly droopy top leader. Subalpine & alpine habitats.
- Unique identifier, to separate it from western hemlock: Found in subalpine and alpine forest, 3000-7000 ft. (Does overlap in western hemlock). Cones much longer. Branches have a brush-like appearance as needles radiate from little spurs on all sides of the branch. More blue-green colored needles.

True firs (*Abies* genus) Evergreen with spire-like or conical crown. Needles attach singly to the twig and are aromatic. Young bark is smooth with resin-filled blisters. Mature bark is ridged and furrowed. Diagnostic cylindrical seed cones sit upright in clusters at the top of trees. Unique identifier: Usually have resinous, round buds that look like crystalized maple syrup.

Pacific Silver fir (*Abies amabilis*)

- Needles: Scattered singly, tending to crowd toward the upper side of branch. Up to 1.5 inches long, dark glossy green above, silvery below with bright white stomatal bands. Distinct notches on blunt tips.
- Buds: New growing tips nearly rounded, purplish, and resinous.
- Bark: Young trees have dark gray, smooth bark with resin blisters. On mature trees, silvery-white and mostly smooth, with linear block plates divided by narrow furrows.

- Cones: 3-6 inches long, standing upright, clustered near top of tree. Purple to brown. Ripen in place with all winged seeds and scales falling away, leaving upright center core in place.
- Form: Large tree with a spire-like top. Lower and middle branches droop.
- Unique identifier: When looking down onto the branch, needles tend to totally cover the brown stem as needles crowd toward the top. Needles glossy green above, silver below.

Subalpine fir (*Abies lasiocarpa*)

- Needles: Scattered singly around the entire branch, but lower branches have more upward tending needles. Entire needle has the same blue-green color, with white stomatal bands, one band on top of needle & two bands on underside of needle. Blunt-tipped end, up to 1.5 inches long. Strong odor.
- Buds: New growing tips are rounded and light brown.
- Bark: Young trees smooth gray to white with resin blisters. Mature bark becomes furrowed with shallow fissures and broad scaly plates.
- Cones: Stand upright on tree, remaining up to a year on the tree (longer than other firs). Purple, cylindrical, and 2.5-4 inches long, clustered near top tree top. Ripen in place with all winged seeds and scales falling away, leaving upright center core in place.
- Form: A medium-sized tree with a dense, spire-like form that easily sheds snow.
- Unique identifier: Grows above 5000' in subalpine and alpine forests at timberline. Stomatal bands of both sides of needle (1-top, 2-bottom). Needles grow all around the branch.

Grand fir (*Abies grandis*)

- Needles Scattered singly along the branch, usually in two outward extending rows. Dark green above, lighter below with 2 distinct white stomatal bands (only on underside of needle), variable in length, up to 2 inches long with notched tips.
- Buds: New growing tips are nearly round, yellow-brown and usually resinous.
- Bark: On young trees, light gray with resin blisters. On mature trees, white and smooth at top nad dark gray to purple at base, with linear furrows divided into flat ridges.
- Cones: Stand upright on tree, yellow-green with purple hues when ripe. 2-4 inches long, . Ripen in place with all winged seeds and scales falling away, leaving upright center core in place.
- Form: Large tree with a rounded crown.
- Unique identifier: Needles with notched-tips, variable lengths, and flat-growing in two distinct rows. 2 stomatal bands on underside of needle; none on top.

Nobel fir (*Abies procera*)

- Needles: Stiff, scattered singly on branch, flattened but plump, with a groove (a channel) on top and mostly pointed tips. 2 White stomatal bands on upper, and 2 bands on lower side of needle. Distinctly blue-green needles attached to stem with a “hockey stick” shape.
- Buds: oblong, blunt, brown, and resin-coated.
- Bark: Young trees have dark gray, smooth with resin blisters. On mature trees, bark becomes furrowed near the base, with purple coloration in these linear furrows.
- Cones: Tall, cylindrical, 6-10 inches long, standing upright, clustered near top of tree. Cone scales are covered with distinctive protruding pointed bracts.
- Form: Tall, symmetrical, and very straight, often clear of branches for 100 feet.
- Unique identifier: Bluish-green needles are distinct from other native firs; needles have a slight groove on upper side and are four-sided, usually arranged on the top side of the twig. Look up at bottom of branch, it looks “combed,” looking down on top of branch, it looks “brushy.” Cones.

Cupressaceae Family. Worldwide distribution with great diversity. Trees or shrubs. Have fibrous bark with peeling vertical strips that protect decay-resistant wood. Seed cones variable, but often spherical and wood (Junipers have fleshy cones). Leaves are scale-like and oppressed closely to the stem and have glands that make aromatic oils. Western U.S. families include cypresses, cedars, redwoods & giant sequoia, and junipers.

Western red cedar (*Thuja plicata*)

- Needles: overlapping, scale-like (<0.2 in.), yellow-green to dark green on top; underside has a white butterfly-shaped stomatal bloom
 - Bark: On mature trees, red-brown to gray-brown; ridged and narrowly furrowed with fibrous stringy strips that peel off.
 - Cones: Upright and in clusters, up to 1 in. long. Green when closed; brown with 8-12 extended scales when opened.
 - Form: Large tree with narrow, open conical head with long pendulous branches.
 - Unique identifier: Stringy bark, clustered, upright cones, underside has a white butterfly-shaped stomatal bloom
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Alaska-Cedar (Yellow) (*Callitropsis nootkatensis* Formerly: *Chamaecyparis nootkatensis*)

- Needles: Yellow-green, scale-like (<0.2 in.), with no white stomatal bloom. Needles closely oppressed to the stem with free tips that are somewhat prickly. Strong resinous odor when crushed.
- Bark: On mature trees, thin, gray-brown with scaly, shaggy linear ridges.
- Cones: 1 inch-diameter spherical with 2-3 pairs of scales, each tipped with a spike. Green when closed; brown when dried and open.
- Form: Medium-sized tree, dwarfed at timberline. Droopy pendulous branches that shed snow.
- Unique identifier: Hanging, droopy branch tips. no white stomatal bloom. Round cones

Juniperus genus: Trees or shrubs with aromatic evergreen, scale-like leaves. Seed cones are round and fleshy. All have mutualistic relationship with birds that eat the “berry-cones” and release the unharmed seeds in scat. Bark is fibrous with linear strips. 50 species in a continuous distribution across the mid-latitudes of the Northern Hemisphere. 7 species in Western North America

- **Rocky Mountain Juniper (*Juniperus scopulorum*)** Tree. Limited distribution in WA, but found in North Central WA along the Columbia River. Scale-like oppressed needles with completely smooth leaf edges (a way to distinguish from *J. occidentalis*).
- **Common juniper (*Juniperus communis*)** Shrub. Common from sea level – 11,000 ft; found throughout the Cascade Eastside, especially at high elevation. Most widely distributed conifer species in the world! Scale-like, sharp, curved needles growing in groups of 3 around the stem.
- **Western juniper (*Juniperus occidentalis*)** Tree. Limited isolated distribution in SE Washington. Scale-like oppressed needles. Leaf-edges fringed with minute teeth (a way to distinguish from *J. scopulorum*)

Taxaceae family: Evergreen with pointed-tip needles. Small trees or shrubs that can be singly or multi-trunked. Seeds born singly on a fleshy structure (aril) that superficially looks berry or fruit-like. 17 species worldwide, mostly in mid-latitude Northern Hemisphere with 2 species in Western North America.

Pacific Yew (*Taxus brevifolia*)

- Needles: Single short (< 1 in.) flat needles attached to branch with a short yellow stem; dark green above, light green below. Needle tips hooked.
- Buds: New growing tips very tiny
- Bark: Thin and broken by broad fissures into scaly ridges. Peels from trunk, with outer flaking scales that are red-purple.
- Cones: An Aril: round, fleshy, red, and small with bottom end open, exposing rounded seed.
- Form: Shrub or small tree, often poorly formed
- Unique identifier: Minimal white stomata bands on underside of leaf . Hook-tipped needle. Leggy and multi-stemmed with branches down to the ground, often in dense shade.