The Gymnosperms of Oregon

Stephen C. Meyers

Key to Gymnosperm Families:

1. Shrubs without functional leaves; stems photosynthetic, green…………..Ephedraceae
   1’ Shrubs or trees with green functional leaves; stems generally not photosynthetic
   2. Leaves awl-like or scale-like…………………………………….Cupressaceae (in part)
   2’ Leaves needle-like.
      3. Seed cone a soft, red aril; 1 seed per cone………………………………Taxaceae
      3’ Seed cones woody or blue to bluish-black and berry-like; seeds per cone 1-many
      4. Seed cones blue to bluish-black and berry-like……..Cupressaceae (Juniperus)
      4’ Seed cones woody.
         5. Seed cone scales peltate; leaves of two kinds, needle-like and awl-like; trees
            giant…………………………………………………………….. Cupressaceae (Sequoia)
         5’ Seed cones imbricate; leaves of one kind; trees not giant………….Pinaceae

Cupressaceae Bartlett
Cypress family

Trees or shrubs, evergreen, monoecious. Bark smooth to fibrous and furrowed. Leaves
needle-like, awl-like or scale-like, simple, alternate or opposite, 2 or 4 ranked or in
whorls of 3. Pollen cones maturing annually, solitary, terminal. Seed cones woody or
berry-like, terminal; scales of woody cones imbricate or peltate. Seeds 1-many per scale,
not winged.

Temperate regions worldwide.

Approximately 25 genera.

6 genera in Oregon.

Although some authorities segregate Taxodiaceae from Cupressaceae, most current
researchers unite the families. Among the conifers, Cupressaceae has the widest
distribution, occurring on all continents but Antarctica.

Key to Cupressaceae genera:

1. Seed cones fleshy, berry-like; scales fused; seeds retained…………………..Juniperus
   1’ Seed cones woody, not berry-like; scales distinct; seeds shed
   2. Leaves alternate, of 2 kinds, linear or awl-like …………………………Sequoia
2’ Leaves opposite in 4 ranks, of 1 or 2 kinds, scale-like or awl-like.
3. Seed cones oblong or elongated; scales not peltate.
4. Seed cones pendent, 2-2.5 cm long, scales in 3 pairs, middle pair fertile,
   leaves appearing 4-whorled; seed wings unequal.......................... _Calocedrus_ 
4’ Seed cones erect to reflexed, 1-1.5 cm long, scales in 4-6 pairs, middle 2-3 pairs
   fertile, leaves opposite in 4 ranks; seed wings unequal.......................... _Thuja_
3’ Seed cones round; scales peltate.
5. Branchlets in nearly cylindrical 3-dimensional clusters; seeds 5-20 per scale,
   wing < width of body................................................. _Callitropsis_ (in part) 
5’ Branchlets in flat clusters; seeds 2-4 per scale, wing ≥ width of body 
6. Branchlets glaucous; underside of branchlets with a white pattern of x’s;
   seed cone with 7-10 scales; bark fibrous................................. _Chamaecyparis_
6’ Branchlets not glaucous; underside without a white pattern of x’s; seed cone with
   4-6 scales; bark scaly.................................................. _Callitropsis_ (in part)

_Cupressus_ Linnaeus

Cypress

_Trees_, evergreen. **Branchlets** in nearly cylindrical 3-dimensional or flat clusters. **Leaves**
opposite, 4-ranked, scale-like, appressed, overlapping. **Pollen cones** yellow. **Seed cones**
maturing in 1-2 years, pendent, globose to nearly globose; scales 4-8, peltate, umbos
present, glaucous or not, persistent. **Seeds** 2-20 per scale, 2-winged, lenticular.

North temperate regions.

Approximately 7 species.

3 species in Oregon.

The nomenclatural history of the _Callitropsis_ is slightly complex. Traditionally most
species in this genus had been assigned to _Cupressus_. However, recent research has
found that North American species of _Cupressus_ are more closely related to the Asian
genus _Xanthocyparis_ than to Old World _Cupressus_. As a result, all North American
_Cupressus_ were transferred to _Xanthocyparis_. Unfortunately, according to botanical
nomenclatural rules, an older and previously overlooked name, _Callitropsis_ has priority
over _Xanthocyparis_. Therefore, all North American _Cupressus_ taxa should be referred to
as _Callitropsis_. Several vocal botanists, however, have petitioned the International
Botanical Congress to official recognize _Cupressus_ as the legitimate name for this genus
(as of this writing, it appears this resolution will pass; thus I use the name Cupressus
here).
To further complicate matters, other recent research has found that *Callitropsis nootkatensis* (previously *Chamaecyparis nootkatensis*) is more closely related to all *Callitropsis* species than to any *Chamaecyparis* species.

Key to *Cupressus* species:

1. Most leaves with a conspicuous, pitlike, abaxial gland; resin copious and sticky ........
   .......................................................................................................................... *C. macnabiana*

1. Most leaves without a conspicuous, pitlike, abaxial gland; resin not copious or sticky.
   2. Branchlets in nearly cylindrical 3-dimensional clusters; seeds 5-20 per scale, wing less than width of body; seed cone 1-2 cm wide .......................................................... *C. bakeri*
   2’ Branchlets in flat clusters; seeds 2-4 per scale, wing equal to or greater than width of body; seed cone 8-12 mm wide .......................................................... *C. nootkatensis*

*Cupressus bakeri* Jepson

Modoc cypress

N

**Trees** to 25 m tall but usually much shorter; mature crown in a column. **Trunks** to 0.4 m in diameter; bark dark reddish-brown, smooth when young, separating into long thin scales with age; branches often crooked; branchlets in nearly cylindrical 3-dimensional clusters, less than 2.5 mm in diameter. **Leaves** gray-green to dark green, approximately 1.5 mm long, glaucous, slightly resinous. **Pollen cones** approximately 2.5 mm long. **Seed cones** silvery, globose, 1-2 cm wide, not glaucous; scales 6-8, umbos present. **Seeds** 5-20 per scale, tan to brown, 2-4 mm; wing less than width of the body.

Mixed evergreen forests.

Klam, Jose; CA.

This species is rarely used as a source for timber or as an ornamental. *Callitropsis bakeri* can be distinguished from *C. nootkatensis* by its 3-dimensional clusters of branchlets.

*Cupressuss macnabiana* A. Murray bis

MacNab cypress

N

**Trees** to 10 m; crown broadly conical. **Trunks** to 1 m in diameter; bark rough, furrowed, fibrous; branchlets comb-like, to 1 mm in diameter. **Leaves** dark green, ovate, approximately 1.5 mm long, occasionally glaucous, with conspicuous pitlike abaxial
gland, resin copious and sticky, sometimes glaucous. **Pollen cones** 15 – 25 mm long. **Seed cones** brown to gray, globose, 1.5--2.5 cm long, not glaucous; scales 6 - 8, umbos present, 2--4 mm long. **Seeds** tan to brown, 2--5 mm, light to medium brown, occasionally glaucous; wing less than width of the body. Lower elevation woodland, often on serpentine substrates.

Jack; CA.

While long rumored to occur in Oregon, it was not until 2010 that botanist Frank Callahan located and documented this species in a remote area of Jackson County.

*Cupressus nootkatensis* D. Don

Alaska-cedar, yellow-cypress

**N**

**Trees** to 40 m tall; mature crown conic. **Trunks** to 2 m in diameter; bark grayish-brown, fissured to expose a bright brown inner bark, up to 2 cm thick; branches spreading and drooping; branchlets in flat clusters, less than 3.5 mm in diameter. **Leaves** green to bluish-green, 1.5-2.5 mm long, not glaucous, rarely resinous. **Pollen cones** 2-5 mm long. **Seed cones** nearly globose, dark red-brown, 0.6-1.2 cm wide, glaucous, resinous; scales 4-6, umbos present. **Seeds** 2-4 per scale, reddish-brown, 2-6 mm, sharp-pointed, somewhat flattened; wing greater than or equal to width of body.

Mid-elevation mountainous slopes.

Doug, Clac, Curr, Gran, Hood, Jack, Jeff, Jose, Lane, Linn, Mult, Wasc; CA, WA; north to AK.

*Callitropsis nootkatensis* is not normally harvested for timber in Oregon but is of commercial importance in other states where its numbers are more numerous. This species is distinguished from *C. bakeri* by its flat clusters of branchlets.

*Calocedrus* Kurz

Incense-cedar

**Trees** monoecious, evergreen; mature crown broadly conic. **Branchlets** in flattened sprays. **Leaves** opposite in 4 ranks, appearing 4-whorled, overlapping, closely appressed, scale-like. **Pollen cones** sessile, ovate. **Seed cones** maturing in 1 year, pendent, woody; scales thin, persistent, in 3 overlapping pairs, middle pair fertile. **Seeds** 2 per scale, unequally 2-winged.
Western North America and East Asia.

3 species.

1 species in Oregon.

*Calocedrus* is most easily distinguished from other false-cedars by the shape of its pendent cones which resemble duck bills or a flying goose.

*Calocedrus decurrens* (Torrey) Florin

Incense-cedar

N

**Trees** to 50 m tall. **Trunks** to 3-5 m in diameter; bark bright reddish-brown, up to 2 cm thick, fibrous, furrowed; branches slender, drooping below, erect toward the top; branchlets 2 times longer than wide; twigs somewhat flattened, yellow-green when young, becoming round, brown and marked with circular scars with age. **Leaves** 3-12 mm long, oblong or obovate, decurrent; lateral leaves keeled, glandular, overlapping inner leaves; inner leaves compressed; apex acute to mucronate. **Pollen cones** yellow, 5-7 mm long. **Seed cones** light reddish-brown, 1.8-2.5 cm long, oblong; scales ovate-oblong, slightly convex, approximately as long as cone. **Seeds** light brown to reddish-brown, 8-12 mm long.

Mountain forests.

Bent, Clac, Coos, Croo, Curr, Desc, Doug, Jack, Jeff, Jose, Klam, Lake, Lane, Linn, Mult, Sher, Wasc, Wash; CA, NV; south to Mexico.

Although the wood of *Calocedrus decurrens* is soft and pliable, it is often infected with a white fungus; therefore it is seldom used for typical lumber applications. It is, however, the most widely used wood for the manufacture of pencils.

*Chamaecyparis* Spach

White-cedar, false-cypress

**Trees**, evergreen. **Trunks** often swollen at base; branchlets in flat clusters. **Leaves** opposite, 4-ranked, scale-like, appressed, overlapping. **Pollen cones** red to dark brown.
Seed cones maturing in 1 year, pendent to slightly erect, globose; scales 7-10, peltate, umbos absent, glaucous, persistent. Seeds 2-4 per scale, lenticular, equally 2-winged.

North temperate regions.

Approximately 5 species.

1 species in Oregon.

Although no true cedars are native to Oregon, Chamaecyparis is one of three genera known collectively as the false-cedars. Chamaecyparis is most easily distinguished from other false-cedars by the shape of its cones, which resemble soccer balls.

Chamaecyparis lawsoniana (A. Murray bis) Parlatore

Port-Orford cedar

N

Trees to 60 m tall; mature crown conic. Trunks to 3 m in diameter above the swollen base; bark reddish-brown, up to 25 cm thick with age, smooth when young, ridged and splitting into long thin shreds; branches horizontal to somewhat drooping; branchlets in flattened clusters. Leaves light green, approximately 1.5-3 mm long, acute, abaxial surface glaucous producing an X-shaped pattern on the underside of sprays. Pollen cones 2-4 mm long, staminate flowers red. Seed cones reddish-brown, 0.8-1.1 cm wide, globose, glaucous; scales 7-10, apex flat or sunken. Seeds 2-4 per scale, light brown, 2-4 mm wide; wing greater than or equal to width of body.

Coast range forests but occasionally inland.

Coos, Curr, Doug, Jose; CA.

This species is closely related to the Chamaecyparis obtusa (Hinoki), which is considered sacred to some in Japan. As a result, the wood of this species is highly prized by Japanese wood merchants. Overharvesting and a rot caused by Phytophthora are current threats to this species.

Juniperus Linnaeus

Juniper

Trees or shrubs, evergreen, monoecious or dioecious; mature crown depressed to rounded or conic. Branchlets angled, not in flattened sprays. Leaves opposite or in
whorls of 3, closely appressed or divergent, of 1 or 2 kinds, needle-like and/or scale-like, resinous or not. **Pollen cones** small. **Seed cones** globose to nearly globose, fleshy, berry-like, seeds retained; scales fused. **Seeds** 1-3 per cone, wingless.

Northern hemisphere.

Approximately 60 species.

4 species in Oregon.

Commercially, junipers in Oregon are not of high economic importance. Worldwide, junipers are best known for being the prime flavoring in gin. Among the gymnosperms in Oregon, junipers are easily recognized by their bluish-black, berry-like cones.

**Key to Juniperus species:**

1. Leaves of one kind, needle-like, not closely appressed; seed cones axillary; mature plants generally less than 1 m tall…………………………...\(J. \) communis var. saxatilis

   1’ Leaves of two kinds, most leaves scale-like, closely appressed, a few leaves needle-like; seed cones terminal; mature plants generally greater than 1 m tall.

2. Scale-like leaves in whorls of 3, very resinous, margins finely serrated

   ……………………………………………………………………………\(J. \) occidentalis var. occidentalis

2’ Scale-like leaves generally opposite, not resinous, margins entire.

3. Scale-like leaves not overlapping or barely so; bark exfoliating in plates

   ……………………………………………………………………………\(J. \) scopulorum

3’ Scale-like leaves overlapping by at least 1/4 their length; bark exfoliating in strips…………………………………………………………\(J. \) virginiana var. virginiana

**Juniperus communis** Linnaeus var. saxatilis Pallas

Common juniper

\(N\) **Shrubs**, dioecious, to 1 m tall, spreading, sometimes mat-like; mature crown depressed, occasionally conic. **Bark** reddish-brown to brown, smooth when young, ridged and exfoliating in thin strips when mature; branches spreading; branchlets erect. **Leaves** of one kind, in whorls of 3, needle-like, linear-lanceolate, 0.5-1.5 cm long, approximately 2 mm wide, divergent, margins entire; abaxial surface dark green, keeled; adaxial surface white, glaucous, slightly concave, stomata numerous; apex acute, rarely obtuse. **Pollen cones** 3-6 mm long. **Seed cones** maturing in 2-3 years, bluish-black, nearly globose, 6-9 mm wide, glaucous, short stalked, glaucous, 1-3 seeded. **Seeds** 3-5 mm wide, brown.

Coastal bluffs, dry rocky soils and mountain summits.
Bake, Desc, Doug, Clac, Coos, Curr, Gran, Harn, Hood, Jeff, Jose, Klam, Lake, Lane, Linc, Linn, Mari, Unio, Wall, Wasc. CA, WA; north to British Columbia and east to Greenland.

*Juniperus communis* contains 5 subspecies, two of which (varieties. *communis* and *hemisphaerica*) do not occur in North America. Variety *megistocarpa* is restricted to the Canadian Maritimes and variety *depressa*, although widespread in North America, has not been collected in Oregon.

*Juniperus occidentalis* Hooker var. *occidentalis*

Western Juniper

N

Trees, monoecious or dioecious, to 20 m tall; mature crown rounded. Trunks to 1 m in diameter; bark light reddish-brown to brown, smooth when young, ridged and exfoliating in thin strips or plates when mature; branches spreading; branchlets erect. Leaves of two kinds, the less numerous leaves needle-like, 3-6 mm long; scale-like leaves in whorls of 3, 1-3 mm long, closely appressed, light green, margins finely serrated; adaxial surface very resinous, concave; apex acute. Pollen cones 2-4 mm long. Seed cones maturing in 2 years, bluish-black, globose to nearly globose, glaucous, resinous, 2-3 seeded. Seeds brown, 2-4 mm wide, sharp pointed, grooved.

Dry, rocky soils, foothills, mountain slopes and bases.

Croo, Desc, Gran, Harn, Jack, Klam, Lake, Malh; CA, ID, NV, WA.

*Juniperus occidentalis* is the most common of *Juniper* species in Oregon. The single other variety, *J. o. var. osteosperma* occurs only in the mountains of California and Nevada. This taxon is not widely harvested for its timber, however it is used occasionally for fence posts, fire wood and carved, novelty artwork.

*Juniperus scopulorum* Sargent

Rocky mountain juniper

N

Trees, dioecious, to 20 m tall; mature crown rounded. Trunks to 1 m in diameter, often branched; bark reddish-brown to reddish-gray, smooth when young, becoming narrowly ridged and covered with long fibrous scales when mature, exfoliating in plates; branches spreading to ascending. Leaves of two kinds; needle-like leaves 3-6 mm long; scale-like leaves light green to blue-gray, opposite, 1-3 mm long, margins entire, not or barely
overlapping, closely appressed, sometimes glaucous; adaxial surface somewhat concave, not resinous; apex generally acute. **Pollen cones** 2-3 mm long. **Seed cones** maturing in 2 years, light blue to bluish-black, globose, 6-8 mm wide, glaucous, resinous to fibrous, usually 2 seeded. **Seeds** brown, 4-5 mm wide, sharp pointed, angled.

Rocky soils on hills and slopes.

Unio, Wall; ID, NV, WA; north to AK, east to ND and southeast to TX and Mexico.

In Oregon, this species is found only in the Wallowa Mountains. Morphologically it is very similar to *Juniperus virginiana*, but can be distinguished from the latter by its non-overlapping or barely overlapping leaves.

*Juniperus virginiana* Linnaeus var. *virginiana*

*Eastern red-cedar*

E

**Trees**, dioecious, to 30 m tall; mature crown conic or dome shaped. **Trunks** to 1.5 m in diameter; bark brown to reddish-brown, smooth when young, fissured and exfoliating in long strips when mature; branches spreading to ascending. **Leaves** of two kinds; needle-like leaves 3-6 mm long; scale-like leaves green, usually opposite, rarely in whorls of 3, 2-4 mm long, overlapping by more than 1/4 of their length, closely appressed, margins entire; adaxial surface slightly concave, not resinous; apex acute. **Pollen cones** 2-3 mm long. **Seed cones** maturing in 1 year, bluish-black, globose to nearly globose, 4-7 mm wide, glaucous, resinous, 1-2 (-3) seeded. **Seeds** brown, round, 2-4 mm wide, sharp pointed.

Wet remnant prairies (in Oregon).

Bent, Lane; eastern North America.

*Juniperus virginiana* is a recent introduction to Oregon having first been reported to escape cultivation in 1988. Currently this taxon has only been recorded as established in a few localities in the Willamette Valley and one unconfirmed locality in Union County.
Sequoia Endlicher

Redwood

N

Trees giant, evergreen; mature crown cylindrical. Branches slender, round in cross section. Leaves alternate, in 2 ranks, of 2 kinds, linear and awl-like, divergent to appressed. Pollen cones yellow to brown. Seed cones maturing in 1 year, pendent, woody; scales persistent, peltate. Seeds 2-7 per scale, marginally 2-winged.

Western North America.

1 species.

This genus is named for Chief Sequoyah, a leader within the Cherokee tribe in the early 19th century and creator of the Cherokee alphabet.

Sequoia sempervirens (D. Don) Endlicher

Redwood, coast redwood

Trees to 110 m tall. Trunks to 9 m in diameter, bases swollen, buttressed and somewhat fluted; bark reddish-brown, up to 35 cm thick, deeply furrowed with broad round ridges; branches drooping below, erect toward the top, lower portion of trunk usually devoid of branches. Leaves of higher branchlets awl-like, appressed, less than 6 mm long; leaves of mature branchlets linear, spreading, 6-20 mm long, somewhat curved; abaxial surface slightly revolute, ribbed, with prominent white stomatal bands, margins entire; adaxial surface dark green, shiny; apex acute, often sharply stiff pointed. Pollen cones ovoid, 2-5 mm long, short stalked. Seed cones reddish-brown, oblong, 2.0-3.5 cm long; scales 15-25. Seeds lenticular, 3-6 mm wide.

Coastal forests.

Curr; CA.

Redwoods are one of the few conifers that are able to reproduce vegetatively from their stumps, an ability that helps them regenerate after fires. Due to its color and resistance to decay, lumber from this species is popular for both interior and exterior building applications. Collectively, Sequoia sempervirens and Sequoiadendron giganteum are the state trees of California.
_Thuja_ Linnaeus

Arborvitae

**Trees**, monoecious, evergreen. **Branches** spreading, horizontal; branchlets in flat clusters, generally horizontal. **Leaves** opposite in 4 ranks, closely appressed, scale-like. **Pollen cones** ovate. **Seed cones** maturing in 1 year, erect to reflexed, woody; scales persistent, overlapping, oblong, basifixed, middle 2-3 pairs fertile. **Seeds** 1-3 per scale, equally 2-winged.

Northern North America and East Asia.

5 species.

1 species in Oregon.

As a rot resistant wood, _Thuja_ is a popular choice for shingles, siding and outdoor decks. _Thuja_ is most easily distinguished from other false-cedars by the shape of its cones, which resemble rose-buds or the bowl of a smoker’s pipe.

_Thuja plicata_ Donn ex D. Don in Lambert

Western redcedar

N

**Trees** to 75 m tall; mature crown narrowly conic. **Trunks** to 5 m in diameter; bark grayish-brown to bright brownish-red, 1.0-2.5 cm thick, fissured, separating into long fibrous shreds; branches horizontal, ends often drooping; twigs 4-sided, flattened, yellowish-green when young, reddish-brown when mature. **Leaves** of mature branchlets (1-) 2-6 mm long, ovate, margins entire; abaxial surface white glaucous producing a butterfly shaped pattern on underside of sprays; adaxial surface bright green; apex acute. **Pollen cones** brown to reddish-brown, 1-3 mm long. **Seed cones** light brown to brown ellipsoid, 1.0-1.5 cm long; scales leathery, tips usually with a stout, short bristle. **Seeds** light brown, lenticular, 4-6 mm wide.

Moist, mixed coniferous forests.

Bent, Clac, Clat, Colu, Coos, Curr, Doug, Hood, Jack, Jeff, Jose, Linc, Linn, Lane, Mari, Mult, Polk, Till, Unio, Wasc, Wash; CA, ID, WA; north to AK and east to MT.

_Thuja plicata_ was a tree of great importance to the native peoples of the Pacific Northwest. Among the numerous products made from this species were lodges, boats, clothing, baskets, fishing nets and ropes. Western redcedar is the provincial tree of British Columbia.
**Ephedraceae** Dumortier

Mormon tea

**Shrubs**, erect, dioecious. **Roots** fibrous. **Bark** cracked and fissured, usually gray; branches grooved, green, photosynthetic, glaucous. **Leaves** scale-like, not green, not photosynthetic. **Pollen cones** compound, short stalked. **Seed cones** compound, sessile or short stalked. **Seeds** brown, angled at top.

Habitat: Dry areas in temperate regions.

1 genus.

Approximately 60 species.

2 species in Oregon.

Rich in alkaloids, particularly ephedrines, many *Ephedra* species have been used medicinally as stimulants, anti-viral, anti-bacterial, and cough medicines. A tea made from the stems of American *Ephedra* species is mildly stimulant, hence the common name Mormon tea.

*Ephedra* Linnaeus

See family description.

Key to Ephedra species:

1. Twigs pale green to bluish-green; leaf bases gray, deciduous…………………*E. nevadensis*
   1’ Twigs bright green to yellowish-green; leaf bases brown to black, persistent

.................................................................…………………………………..*E. viridis*

*Ephedra nevadensis* S. Watson

Nevada ephedra

N

**Shrubs** 0.25-1.0 m. **Branches** alternate or whorled; angle of divergence about 45 degrees, twigs pale green to bluish-green, fading to gray, glaucous when young. **Buds** conic, apex obtuse. **Leaves** opposite, rarely in whorls of three, 2-6 mm, deciduous. **Pollen cones** 1-5 per node, 4-8 mm, ellipsoid. **Seed cones** 1-several per node, globose, 5-10 mm; bracts opposite, 3-5 pairs, circular, margins entire, brown to green center. **Seeds** 1-2, globose to ellipsoid, 6-9 mm, smooth.

Dry, rocky slopes and sandy flats.
Harn; CA, NV; southeast to AZ.

Typically coning in late winter to early spring, *Ephedra nevadensis* is most easily distinguished from our only other *Ephedra* species, *E. viridis*, by the bluish-green color of its twigs.

*Ephedra viridis* Coville

Green ephedra

N

**Shrubs** 0.5-1.0 m. **Branches** alternate or whorled; angle of divergence about 30 degrees; twigs bright green to yellowish-green, fading to yellow, persistent. **Buds** conic, apex obtuse. **Leaves** opposite 2-5 mm, persistent. **Pollen cones** 2-6 per node, 5-7 mm, ovoid. **Seed cones** 2-several per node, 6-10 mm, ovoid, bracts opposite 6-10 pairs, ovate, margins entire, yellow center. **Seeds** 2, 5-8 mm, ellipsoid, smooth.

Dry, rocky slopes, canyons and sagebrush scrub.

Harn; CA, NV; east to CO and southeast to NM.

*Ephedra viridis* typically cones in spring and is easily distinguished by its yellowish-green twigs.

**Pinaceae** Lindley

Pine family

**Trees**, evergreen (deciduous in *Larix*), monoecious. **Bark** smooth to scaly or furrowed. **Leaves** needle-like, simple, alternate or spirally arranged. **Pollen cones** maturing annually, axillary. **Seed cones** woody, maturing in 1-3 seasons; scales imbricate. **Seeds** 2 per scale, winged or wingless.

Primarily Northern Hemisphere.

10 genera.

6 genera in Oregon.

Of major economic importance, the members of this family are used as ornamentals and as a source of turpentine, tars, essential oils and food. Additionally, most of the world’s softwood timber is harvested from Pinaceae species. Primarily a Northern Hemisphere family, only one species, *Pinus merkusii*, is found south of the equator.
Key to Pinaceae genera:

1. Leaves in bundles of 2 or more, bundles not scaly sheathed
   2. Leaves deciduous, in clusters of 10 or more………………………….……...…...Larix
   2’ Leaves evergreen, in clusters of 2-5 …………………………………………Pinus
1’ Leaves borne singly, not scaly sheathed at base
   3. Leaf tips sharp pointed or acute, more or less square shaped, triangular or somewhat flattened in cross section……………………….………….…..................Picea
   3’ Leaf tips rounded or notched, flattened in cross section (but square shaped in Abies procera).
   4. Seed cones erect, scales and bracts deciduous……………………………..………….….……...Abies
   4’ Seed cones pendent, scales and bracts persistent
      5. Twigs with peg-like projections after leaves fall, seed cone bracts shorter than scales……………………………………………………………………………Tsuga
      5’ Twigs without peg-like projections, seed cone bracts longer than scales
         ………………………………………………………………………………………..Pseudotsuga

Abies Miller

Fir

Trees, large to medium sized, evergreen. Bark initially smooth, generally becoming furrowed with age; branches short, horizontal to drooping, those bearing cones may be ascending; leaf scars prominent. Leaves borne singly, persisting at least 5 years, 1 or 2-ranked, sessile, sheath absent. Pollen cones grouped. Seed cones maturing in 1 season, erect, cylindrical or oblong cylindrical, not falling as a whole; scales fan-shaped, deciduous. Seeds winged.

North temperate regions.

Approximately 44 species.

6 species in Oregon.

Firs are a major component of Pacific Northwest coniferous forests. In addition to providing food and habitat for many animals, several species are cut for lumber. Firs are also grown on a large scale for use as ornamentals and Christmas trees. Although most major fir species are readily identifiable, hybrid taxa may pose a challenge in distinguishing them from their parental taxa.
Abies amabilis Douglas ex J. Forbes

Pacific silver fir, silver fir.

N

Trees up to 75 m tall; mature crown steeple-like. Trunks to 2.6 m in diameter; bark gray, smooth and scaly with age; branches at right angles to trunk; twigs generally opposite, pubescence tan. Leaves usually 2-ranked, curved upward, flexible, 1-2.5 cm long, 1-3 mm wide, cross section flat; abaxial surface white, dark midrib with 5-6 stomatal rows on each side; adaxial surface dark green, grooved; apex notched to round. Pollen cones red to reddish yellow. Seed cones cylindrical, purple, 8-15 cm long; scales puberulent; bracts included, approximately 1/3 the length of the scales. Seeds tan, 10-12 mm long, 4 mm wide; wing nearly as long as body.

Habitat: Subalpine forests.

Bent, Colu, Clac, Clat, Desc, Doug, Hood, Jack, Jeff, Klam, Lane, Linc, Linn, Mari, Mult, Polk, Wasc, Wash; CA, WA; north to British Columbia.

The white, glaucous coating on the abaxial side of Abies amabilis leaves give this species a “silver” appearance, hence the common name, silver fir.

California white fir, Sierra white fir

**Trees** up to 75 m tall; mature crown steeple-like. **Trunks** to 1.5 m in diameter, furrowed; bark white to gray, smooth; branches spreading, drooping; twigs generally opposite, glabrous or with yellow to brown pubescence. **Leaves** 2-ranked or if 1-ranked only on upper branches, spreading to erect and curving upward, flexible, cross section flat, 1.5-6 cm long, 1.5-3 mm wide; abaxial surface grayish to bluish green, occasionally with white glaucous bands, 4-7 stomatal rows on each side of midrib; adaxial surface grayish to bluish green, grooved, with 0-12 stomatal rows; apex generally rounded, rarely notched on abaxial branches. **Pollen cones** red, purple, yellow or green. **Seed cones** usually green, rarely purple, cylindrical, 6-12 cm long; scales pubescent; bracts included, shorter than the scales. **Seeds** tan, 7-12 mm long, 3 mm wide; wing 1.5-2 times long as body.

Mid-elevation forests.

Bake, Clak, Croo, Curr, Desc, Doug, Gran, Harn, Jack, Jeff, Jose, Klam, Lake, Lane, Linn, Umat, Unio, Wall, Wasc; California.

Morphological and molecular DNA evidence indicates that no pure *Abies concolor* may exist in Oregon. Rather, all previously known populations of *A. concolor* are now assigned as *A. concolor × A. grandis*. These populations vary in their degree of morphological intermediacy between *A. concolor* and *A. grandis*. However, specimens of *A. concolor × A. grandis* can be distinguished from pure *A. grandis* by seed cone scale and leaf morphology.

*Abies grandis* (Douglas ex D. Don in Lambert) Lindley

Grand fir

**N**

**Trees** up to 75 m tall; mature crown conic. **Trunks** to 1.5 m in diameter; bark gray, becoming brown with age, shallow-furrowed; branches spreading, drooping; twigs generally opposite, pubescent. **Leaves** 2-ranked, spreading, flexible, cross section flat, 1.5-5 cm long, 1.5-3 mm wide, longer and shorter leaves intermixed; abaxial surface white with 5-7 stomatal rows on each side of midrib; adaxial surface light to dark green, grooved; apex generally notched. **Pollen cones** red, purple, yellow or green. **Seed cones** usually green, rarely purple or gray, cylindrical, 8-15 cm long; scales pubescent; bracts included, shorter than the scales. **Seeds** tan with red tinge, 6-8 mm long, 3-4 mm wide, wing 2 times as long as body.

Low to mid elevations in mixed evergreen forests.
Bake, Bent, Clac, Clat, Colu, Coos, Croo, Curr, Desc, Doug, Gran, Hood, Jack, Jeff, Jose, Klam, Lane, Linn, Mari, Morr, Mult, Polk, Till, Umat, Unio, Wall, Wase, Wah, Whel, Yamh; CA, WA; north to British Columbia and east to MT.

In southern Oregon, the Cascades, and the Blue and Wallowa Mountains \textit{A. concolor} \times \textit{A. grandis} individuals are not uncommon.

\textit{Abies lasiocarpa} (Hooker) Nuttall var. \textit{lasiocarpa}

Subalpine fir

N

\textbf{Trees} up to 30 m tall; mature crown steeple-like. \textbf{Trunks} to 1 m in diameter; bark gray, smooth, furrowed with age; branches straight; twigs opposite to whorled, puberulent for several years. \textbf{Leaves} spiraled, erect and curving upward, flexible, cross section flat, 2-3.5 cm long, 1.5-2 mm wide; abaxial surface grayish to bluish green, often with white glaucous bands, 4-5 stomatal rows on each side of midrib; adaxial surface grayish to bluish green, glaucous, grooved, 4-6 stomatal rows; apex rounded to notched. \textbf{Pollen cones} bluish to purplish-green. \textbf{Seed cones} purple, cylindrical, 6-12 cm long; scales pubescent; bracts included, shorter than the scales. \textbf{Seeds} tan to light brown, 5-6 mm long, 2-3 mm wide; wing 1.5 times as long as body.

Subalpine forests.

Bake, Clac, Desc, Doug, Gran, Hood, Jack, Jeff, Klam, Lane, Linn, Mari, Umat, Wall; CA, WA; north to AK.

All \textit{Abies lasiocarpa} specimens found in our state are \textit{A. lasiocarpa} var. \textit{lasiocarpa}. The single other variety, \textit{A. lasiocarpa} var. \textit{arizonica} is endemic to Arizona, New Mexico and Colorado.

\textit{Abies magnifica} A. Murray bis \times \textit{procera} Rehder

Shasta red fir

N

\textbf{Trees} to 60 m tall; mature crown narrow and conic. \textbf{Trunks} to 2.5 m in diameter; bark gray, smooth, bark of abaxial trunk deeply furrowed with reddish plates; branches ascending in crown, descending abaxial; twigs opposite to whorled, pubescent 1st year, glabrous after 1st year. \textbf{Leaves} usually 1-ranked, occasionally 2-ranked on abaxial branches, curving upward, flexible, cross section 4-sided, occasionally 3-sided, 2-3.5 cm
long, 2-2.5 mm wide; abaxial surface bluish-green, glaucous, with 8-10 stomatal rows; adaxial surface bluish-green, glaucous, often with 2 whitish bands, not or weakly grooved, 8-10 stomatal rows; apex rounded to acute. **Pollen cones** purple. **Seed cones** purple to greenish-brown, oblong-cylindrical, 15-20 cm long; scales pubescent; bracts exserted and reflexed over scales, covering 25% of cone at maturity. **Seeds** red, 14-16 mm long, 5-7 mm wide; wing approximately same length as body.

Mid-elevation to subalpine forests.

Doug, Jack, Jose, Klam, Lake, Lane; CA.

Morphological and molecular DNA evidence indicates that no pure *Abies magnifica* is likely to exist in Oregon. As a result, all previously described populations of *A. magnifica* are now assigned to *A. magnifica × A. procera*. Specimens of *A. magnifica × A. procera* can be distinguished from pure *A. procera* by seed cone and seed cone bract morphology.

*Abies procera* Rehder

Noble fir

N

**Trees** to 80 m tall; mature crown steeple-like, the top rounded. **Trunks** to 2.5 m in diameter; bark gray, smooth when young, furrowed and reddish-brown with age; branches at right angles to trunk; twigs opposite to whorled, pubescent for several years. **Leaves** 1-ranked, curving upward, flexible to stiff, 1-3.5 cm long, 1.5-2 mm wide, cross section 4-angled, occasionally weakly 4-angled; abaxial surface bluish-green, glaucous, with 2-4 whitish bands, 12-28 stomatal rows; adaxial surface bluish-green, glaucous, often with 2 whitish bands, 0-14 stomatal rows; apex rounded to notched. **Pollen cones** reddish. **Seed cones** purple to green, oblong-cylindrical, 10-15 cm long; scales pubescent; bracts exerted and reflexed over scales, covering 90% of cone at maturity. **Seeds** tan to brown, 11-13 mm long, 2-4 mm wide; wing slightly longer than body.

Mid-elevation to subalpine forests.

Bent, Clac, Clat, Hood, Jeff, Lane, Linc, Linn, Mult, Polk; CA, WA.

*Abies procera* grows in isolated populations on mountains. As a result of this isolation, morphology may vary greatly between populations. In addition, stands of *A. magnifica X A. procera* are known to exist in Oregon. However, *A. procera* is most easily distinguished by its seed cone bracts which cover over 90% of the cones.
Larix Miller

Larch, tamarack

Trees, deciduous. Trunks straight, slender; bark initially smooth, becoming furrowed with age; branches slender, ascending to drooping; leaf pegs prominent. Leaves in dense clusters of 10-30, soft, turning yellow before dropping, sheath absent. Pollen cones solitary. Seed cones maturing in 1 season, erect, oblong-ovoid, falling as a whole; scales orbicular, persistent. Seeds winged.

Cold north temperate regions.

10 species.

1 species in Oregon.

The deciduous needle-like leaves of Larix species are unique among the gymnosperms. The hard, heavy, rot resistant wood of Larix species is often utilized for outdoor applications such as rail road ties, pilings and fence poles.

Larix occidentalis Nuttall

Western larch

N

Trees to 40 m tall; mature crown conic. Trunks to 2 m in diameter; bark reddish-brown, thin when young, thick and furrowed with age, scaly, flaky; branches somewhat ascending on upper branches to drooping on lower branches, in forests often without branches for most of height; twigs stout, orange-brown pubescent when young, becoming glabrous, with prominent leaf pegs. Leaves soft, flexible, 2-4.5 cm long, 0.5-1.0 mm wide, triangular in cross section; abaxial surface pale green, keeled; adaxial surface pale green, with a convex midrib; apex sharp pointed. Pollen cones ovate-oblong, less than 1 cm long, sessile or on short stalks, yellow. Seed cones reddish-brown, oblong-ovoid, 2.5-4 cm long, on short curved stalks; scales ovate; bracts exserted several millimeters beyond the scales, tipped with awns to 3 mm. Seeds 3-6 mm long, reddish-brown; wing twice as long.

Mid-elevation forests.

Bake, Croo, Desc, Hood, Gran, Jeff, Morr, Umit, Unio, Wasc, Wall, Whee;, ID, WA; north to British Columbia and east to MT.

The largest of the American Larix species, this species produces one of the most valuable timbers in the western United States. Trees of this species may live over 500 years.
*Picea* A. Dietrich

Spruce

**Trees** evergreen; crown conic to narrowly conic; top most shoots erect. **Bark** whitish-gray to reddish-brown, thin, scaly, becoming furrowed with age; branches whorled, horizontal to drooping, leaf scars prominent. **Leaves** rigid, borne singly, persisting 4-10 years, spreading in all directions, 4-sided to flattened or 3-sided, apex sharp to bluntly pointed, sheath absent. **Pollen cones** grouped. **Seed cones** maturing in 1 season, pendent, oblong to cylindrical; scales elliptic or diamond shaped to fan-shaped, persistent; bracts included.

North temperate regions.

Approximately 35 species.

3 species in Oregon.

As a result of their symmetrical conic growth habit of spruce species are popular as ornamentals and Christmas trees. In the past, spruce woods were highly valued in aircraft manufacturing. Notably, the first Wright Brothers aircraft and the Hughes H-4 Hercules, nicknamed the “Spruce Goose” were constructed from the wood of this genus.

Key to *Picea* species:

1. Branches conspicuously lax and drooping; leaves blunt apexes; seed cone scales with usually entire margins, fan-shaped..............................*P. breweriana*

   1’ Branches generally spreading, not lax and drooping or if drooping only somewhat; leaves with sharp apexes; seed cone scales with usually erose margins, elliptic to diamond-shaped.

2. Leaves 4-sided or nearly so, stomatal bands conspicuous on both adaxial and abaxial surfaces; seed cone bracts less than 1/4 the length of the scales..............*P. engelmannii*

   2’ Leaves flattened or 3-sided, stomatal bands conspicuous on adaxial surface only (stomatal bands on abaxial surface, if present, weak); bracts greater than 1/4 the length of the scales.........................................................*P. sitchensis*

*Picea breweriana* S. Watson

Weeping spruce, Brewer spruce

N

**Trees** to 40 m tall; mature crown conic. **Trunks** to 1.3 m in diameter; bark whitish gray to brown, scaly, becoming furrowed with age; branches lax and drooping; twigs grayish-brown, slender, pendant, pubescent. **Leaves** spreading in all directions, flattened,
triangular or rounded triangular in cross section, 1.5-3 cm long, 1-2 mm wide, somewhat rigid; abaxial surface dark green, shining, angled or rounded, without stomatal bands; adaxial surface whitish-green, flattened, glaucous, ridged, with conspicuous stomatal bands; apex blunt. **Pollen cones** purple to reddish, 1-2 cm long. **Seed cones** purple to orange-brown, cylindrical, narrowed at both ends 6-12 cm long, rigid, glaucous when young; scales fan-shaped, 1.5-2 cm long, 1.5-2 cm wide, margins usually entire; bracts less than 1/4 the length of the scales. **Seeds** brown, 2.5-3.5 mm long; wing 4 times as long as body.

Montane and subalpine ridges.

Coos, Curr, Jose; CA.

The rarest of the North American spruces, this species is not generally harvested for lumber. However, *Picea breweri*ana is utilized as an ornamental, particularly in northern Europe, where it is popular because of its drooping branches and twigs, unique among the spruces.

*Picea engelmannii* Parry ex Engelmann

Engelmann spruce

N

**Trees** to 55 mm tall; mature crown narrowly conic. **Trunks** to 2 m in diameter; bark gray to reddish-brown, scaly, deeply furrowed with age; branches horizontal to somewhat drooping; twigs greenish-yellow to dark yellow-brown, stout, not pendant, pubescent. **Leaves** spreading in all directions, 4-angled in cross section, 2-3 cm long, 1-1.5 cm wide, rigid; abaxial surface blue-green, glaucous when young, ridged, with 2 obvious white stomatal bands; adaxial surface blue-green, glaucous when young, ridged, with 2 obvious white stomatal bands; apex sharply pointed. **Pollen cones** purplish to reddish, 1-2 cm long. **Seed cones** light green when young, light brown when mature, ovoid-oblong, broadest near middle, 3-7 cm long, flexible; scales elliptic to diamond shaped, 1-2 cm long, 1-1.5 cm wide, margins usually erose; bracts less than 1/4 the length of the scales. **Seeds** brown, 2.5-3.5 mm long; wing twice a long as body.

Montane and subalpine forests.

Bake, Clac, Desc, Gran, Hood, Jack, Jeff, Klam, Lane, Linn, Umat, Unio, Wall, Whee; CA, ID, NV, WA; north to British Columbia, south to Mexico and east from MT to NM.

As a weak, knotty wood *Picea engelmannii* is utilized mainly for pulp and low grade lumber. Slow growing, high altitude trees are used occasionally for musical instruments. Among the Oregon spruces, *P. engelmannii* is the only species with 4-sided leaves.
**Picea sitchensis** (Bongard) Carrière

Sitka spruce

N

**Trees** to 70 m tall; mature crown narrowly conic. **Trunks** to 5 m in diameter; bark grayish-brown to reddish brown, thin, scaly; branches horizontal to somewhat drooping; twigs yellowish to reddish-brown, stout, not pendant, glabrous. **Leaves** spreading in all directions, triangular or rounded triangular in cross section, flattened, 1-3 cm long, 1-1.5 mm wide, rigid; abaxial surface yellow-green to blue-green, angled or rounded, with faint or absent stomatal bands; adaxial surface whitish-green, flattened, glaucous, ridged, with conspicuous stomatal bands; apex sharp pointed. **Pollen cones** reddish, 2-4 cm long. **Seed cones** yellow to reddish-brown, oblong, 5-10 cm long, rigid; scales elliptic to diamond shaped, 1.5-2.0 cm long, 1-1.5 cm wide, margins usually erose; bracts greater than 1/4 the length of the scales. **Seeds** red-brown, 1.5-2.5 mm long; wing 6 times as long as the body.

Coastal forests.

Clat, Coos, Curr, Doug, Lane, Linc, Till; CA, WA; north to AK.

As a result of its high strength to weight ratio *Picea sitchensis* is valued as lumber for musical instruments, boats and in the past, aircraft. Only found in wet coastal forests, *P. sitchensis* is distinguished from other spruces in our area by the combination of its flat to 3-sided leaves and spreading branches.

**Pinus** Linnaeus

Pine

**Trees**, monoecious, evergreen; mature crowns conic to irregular. **Bark** smooth when young, becoming fissured with age; branches whorled, ascending to decending; twigs generally resinous. **Leaves** simple, alternate, in clusters of 2-5, square in cross section or 2-3 angled and rounded on abaxial surface, apex acute, sheath deciduous or persistent. **Pollen cones** in clusters. **Seed cones** maturing in 2 (-3) years, pendent to erect, conic to cylindric; scales persistent; bracts included.

North temperate and mountain regions.

Approximately 100 species.

10 species in Oregon.
In Oregon, *Pinus* species are readily identified by their leaves in clusters of 2-5. Only one other gymnosperm genus in Oregon (*Larix*) has clustered leaves. However, the leaves of *Larix* are in clusters of 10 or more and are deciduous.

Key to *Pinus* species:

1. Leaves in clusters of 5
   2. Leaves straight; seed cones usually 15 cm long or longer; stalks greater than 2 cm long.
      3. Seed cones generally greater than 25 cm long; conspicuous stomatal lines on all surfaces of leaves. *P. lambertiana*
      3’ Seed cones shorter than 25 cm long; conspicuous stomatal lines only on adaxial surface of leaves. *P. monticola*
   2’ Leaves curved; seed cones less than 15 cm long; stalks absent or less than 2 cm long.
      4. Leaves 1.5-4 cm long; seeds wingless or nearly so, umbos central
         4’ Leaves 3-7 cm long; seed wings as long or longer than body; umbos terminal.
         5. Mature seed cones 8 cm long or less, ovate to nearly globose, remaining closed at maturity; scales often broken off by animals. *P. albicaulis*
         5’ Mature seed cones 7 cm long or greater, oblong to lance-cylindrical, opening at maturity; scales attached. *P. flexilis*
   1’ Leaves in clusters of less than 5.
      6. Leaves in clusters of 2, less than 8 cm long.
         7. Base of cones asymmetric. *P. contorta*
         7’ Base of seed cones symmetric or nearly symmetric. *P. sylvestris*
      6’ Leaves in clusters of 3, greater than 8 cm long.
         7. Seed cones strongly asymmetrical at base, remaining closed for many years after maturity; leaves 9-15 cm long. *P. attenuata*
         7’ Seed cones symmetrical or nearly so at base, opening at maturity; leaves 12-32 cm long.
         8. Seed cones less than 15 cm long. *P. ponderosa var. ponderosa*
         8’ Seed cones usually greater than 15 cm long.
            9. Seed cone apophyses continuous with umbos forming long, up-curving claws; buds resinous. *P. sabiniana*
            9’ Seed cone apophyses not continuous with umbos and not forming long, up-curving claws; buds not resinous. *P. jeffreyi*

*Pinus albicaulis* Engelmann

White-bark pine

**Trees** to 20 m tall; mature crown compact and conic or rounded, sometimes deformed by wind. **Trunks** to 1.5 m in diameter, straight to contorted and twisted; bark whitish to
gray, smooth when young, fissured into scales with age; inner bark reddish; branches horizontal to ascending, usually persistent to base; twigs orange to dark reddish-brown when young, gray to gray-brown when mature, slightly roughened by scars. Buds ovoid, light red-brown, not resinous. Leaves in clusters of 5, dark green to yellow-green, usually up-curved, 3-7 cm long, 1-2 mm wide, margins entire; adaxial surfaces whitened by stomatal bands; apex sharply stiff-pointed; sheaths deciduous. Pollen cones dark red, ovoid, 10-15 mm long. Seed cones gray to dark purple, ovoid to sub-globose, 4-9 cm long, erect, symmetric, sessile to short stalked, maturing in 2 years, remaining closed, generally opened by animal activity; umbos terminal, short, tip acute, prickled. Seeds dark brown, obovoid, sharp pointed, 7-12 mm long; wingless.

Montane forests.

Bake, Desc, Gran, Hood, Jack, Jeff, Jose, Klam, Lake, Lane, Mari, Wall; CA, ID, NV, WA; north to British Columbia and east to WY.

One of the most distinguishing features of Pinus albicaulis are its cones. The cones remain closed and are generally ripped open by animals and in this manner the seeds are dispersed.

Pinus attenuata Lemmon

Knob-cone pine

N

Trees to 30 m tall; mature crown conic to rounded, often many branched. Trunks to 1 m in diameter, straight; bark purplish to dark brown, smooth when young, shallowly fissured into scaly plates when mature; branches ascending; twigs dark yellow brown, roughened by bud-scales. Buds dark brown, oblong-ovoid, resinous. Leaves in clusters of 3, yellowish-green, straight to slightly curved, twisted, 8-14 cm long, 1-2 mm wide, margins serrulate; all surfaces with white stomatal bands; apex sharp callous-tipped; sheaths persistent. Pollen cones light brown to orange brown, ellipsoid, 10-15 mm long. Seed cones light brown to reddish-brown, oblique-ovoid, very asymmetric, 6-15 cm long, reflexed to recurved, stalks less than 1 cm long, maturing in 2 years, remaining closed for several decades or opening at burning; umbos central, pyramidal, sharp pointed, prickled. Seeds black, oblong-oval, sharp pointed, 6-7 mm long; wing three times as long as body.

Chaparral.

Curr, Doug, Jose, Lane; CA; south to Mexico.

Pinus attenuata is easily identified by knob-like umbos on its cones. The cones of this species will generally not open unless exposed to the heat of fire.
**Pinus balfouriana** Greville & Balfour

Foxtail pine

N

**Trees** to 22 m tall; mature crown compact conic to irregular. **Trunks** to 2 m in diameter, straight; bark gray to reddish-brown, somewhat smooth when young, irregularly fissured and often divided into irregular square, scaly plates when mature; branches ascending or descending, often contorted; twigs reddish-brown to gray, occasionally puberulent, roughened by scars. **Buds** ovoid-acuminate, reddish-brown, resinous. **Leaves** in clusters of 5, bluish-green to yellow-green, up-curved, 1.5-4 cm long, 1.0-1.5 mm wide, margins entire; abaxial surfaces with resin bands; adaxial surfaces with white stomatal bands; apex acute and sharp-pointed; sheaths deciduous. **Pollen cones** reddish, ellipsoid, 6-10 mm long. **Seed cones** purple to reddish-brown, ovoid-cylindrical, symmetric, 6-12 cm long, pendent, stalks less than 1.5 cm long, maturing in 2 years, opening at maturity; umbos central, depressed or less than 1 mm, prickles very short or absent. **Seeds** brown with purple or red spots, ovoid, rounded at apex, 7-10 mm long; wing approximately equal to body.

Subalpine to alpine forests.

Jose; CA.

To date, *Pinus balfouriana* has only been collected once in Oregon, in Josephine County, within 1 mile of the California/Oregon border.

**Pinus contorta** Loudon

Lodgepole pine

N

**Trees** to 45 m tall; mature crown variable. **Trunks** to 0.8 m in diameter, straight to contorted; bark orange-brown to reddish-brown, fissured to plated; branches descending to ascending; twigs yellowish-orange when young, dark reddish-brown with age, roughened by bud scales. **Buds** reddish-brown, ovoid, resinous. **Leaves** in clusters of 2, dark green to yellow-green, straight to slightly curved, twisted, 2-8 cm long, 0.7-2.5 mm wide, margins finely serrulate; all surfaces with fine stomatal bands; apex usually acute; sheaths persistent. **Pollen cones** orange-red, ellipsoid to cylindrical, 0.5-1.5 cm long. **Seed cones** light brown to reddish-brown, ovoid to sub-globose, asymmetric, 2-5 cm long, pendent, stalks less than 1 cm long, maturing in 2 years, opening at maturity; umbos central, triangular, less than 5 mm, prickles less than 5 mm long. **Seeds** brown or reddish-brown with black spots, obovoid, oblique and tapering at apex and base, 2-6 mm long; wing at least twice as long as body.
3 varieties.

2 varieties in Oregon.

With the exception of *Pinus sylvestris*, which one is unlikely to encounter in the wild, *P. contorta* is the only 2 needled pine species found in Oregon.

Key to *Pinus contorta* varieties:

1. Leaves dark green, usually less than 1 mm wide; mature bark furrowed; seed cones strongly asymmetrical, often in whorls……………….…..…*P. contorta* var. *contorta*
1’ Leaves yellow-green, usually 1 mm wide or greater; mature bark not furrowed; seed cones asymmetrical, usually solitary or in 2b.s……………….*P. contorta* var. *latifolia*

*Pinus contorta* Loudon var. *contorta*

Shore pine

N

**Trees** to 10 m tall, sometimes **shrubs** formed by wind and salt spray; mature crown irregular or flat. **Trunks** to 0.5 m in diameter, straight inland, contorted and bent near ocean; bark furrowed and divided into small scaly plates; branches often contorted. **Leaves** dark green, 2-7 cm long, 0.7-1.0 mm wide. **Seed cones** often in whorls.

Maritime forests.

Clat, Coos, Curr, Doug, Lane, Linc, Till; CA, WA; north to AK.

This subspecies is found only in coastal forests. Often specimens of this subspecies have a distorted and contorted appearance due to the harsh, windy environment in which they grow.

*Pinus contorta* Loudon ssp. *latifolia* Engelmann in S. Watson

Lodgepole pine

N

**Trees** to 45 m tall; mature crown conic. **Trunks** to 0.8 m in diameter, straight; bark not furrowed, separated into loose plates; branches usually horizontal. **Leaves** dark green, 5-8 cm long, 1.0-2.5 mm wide. **Seed cones** solitary or in pairs.
Montane forests from low to high elevations.

Bake, Clac, Curr, Desc, Gran, Jack, Jeff, Jose, Klam, Lake, Lane, Linn, Mult, Umat, Unio, Wall; ID, WA; north to AK, southeast to WY and east to SD.

The straight slender trunks of this subspecies were popular with Native Americans for use in lodges and teepees, hence the common name.

*Pinus flexilis* E. James

Limber pine

**N**

**Trees** to 20 m tall; mature crown conic to rounded. **Trunks** to 2 m in diameter, straight, sometimes contorted; bark gray, smooth, becoming ridged with rectangular scaly plates with age; branches horizontal to ascending, usually persistent to base; twigs reddish-brown and pubescent when young, becoming gray with age, smooth or nearly so with some bud scars. **Buds** reddish-brown, ovoid, resinous. **Leaves** in clusters of 5, dark green, up-curved, 3-6 cm long, 1.0-1.5 mm wide, margins entire to finely serrulate; abaxial surfaces with faint stomatal bands; adaxial surfaces obvious stomatal bands; apex acute; sheaths deciduous. **Pollen cones** red or yellow, ellipsoid-cylindrical, 1.2-1.6 cm long. **Seed cones** light brown, ovoid to ovoid-cylindrical, symmetric, 7-15 cm long, horizontal to pendent, sessile to less than 2 cm long, maturing in 2 years, opening at maturity; umbos terminal, less than 2 mm, prickles absent. **Seeds** brown to reddish-brown, sometimes with spots, oval, compressed, 6-12 mm long; wingless or nearly so.

High altitude montane forests.

Bake, Wall; CA, ID, NV, WA; north to Alberta, southeast to NM and east to NE.

In Oregon *Pinus flexilis* is found only in the Wallowa Mountains. Morphologically it is similar to *P. albicaulus*, but is distinguished from the latter by its larger cones that open at maturity.
Pinus jeffreyi Greville & Balfour

Jeffery pine

N

Trees to 60 m tall; mature crown conic to rounded. Trunks to 2.3 m in diameter, straight; bark yellow-brown to reddish-brown, deeply furrowed, forming large irregular scaly plates; branches horizontal to ascending; twigs purplish-brown, usually glaucous, roughened by bud scars. Buds ovoid, light brown to reddish-brown, not resinous. Leaves in clusters of 3, bluish-green to yellow-green, straight, slightly twisted, 12-25 cm long, 1.5-2.0 mm wide, margins finely serrulate; all surfaces with fine stomatal lines; apex acute; sheaths persistent. Pollen cones yellow to brown, lance-cylindrical, 2.0-3.5 cm long. Seed cones brown to reddish-brown, oblong, slightly asymmetric, (12-)15-30 cm long, horizontal to pendent, stalks less than 3 cm long, maturing in 2 years, opening at maturity; umbos central, raised, prickles reflexed. Seeds brown with black spots, ovoid, 8-12 mm long; wing twice as long as body.

Dry forests.

Curr, Jack, Jose, Klam, Lane; CA, NV; south to Mexico.

Morphologically Pinus jeffreyi is very similar to P. ponderosa and the two species are known to hybridize. P. jeffreyi can be differentiated from P. ponderosa by its cones which are generally longer than 15 cm and have reflexed prickles. Conversely P. ponderosa cones are less than 15 cm long and have straight prickles. Some claim that the two species have unique smells. Allegedly, P. jeffreyii trees have a banana, pineapple or vanilla scent, whereas P. ponderosa trees have a turpentine scent.

Pinus lambertiana Douglas

Sugar pine

N

Trees to 70 m tall; mature crown conic to broad and flattened with horizontal branches. Trunks to 3 m in diameter, straight; bark smooth and gray when young, brown to reddish-brown, furrowed with long scaly plates when mature; branches horizontal to ascending, lower branches sometimes drooping; twigs green to brown and pubescent when young, becoming glabrous and gray with age, smooth with bud scars flush to surface or nearly so. Buds ovoid, reddish-brown, resinous. Leaves in clusters of 5, bluish-green, straight, slightly twisted, 5-9 cm long, 1-2 mm wide, margins finely serrulate; abaxial surfaces with faint stomatal lines; adaxial surfaces with obvious white stomatal lines; apex acute; sheaths deciduous. Pollen cones yellow, ellipsoid-cylindrical,
10-15 mm long. **Seed cones** cylindrical, symmetric, 30-45 cm long, pendent, stalks 5-16 cm long, maturing in 2 years, opening at maturity; umbos terminal, slightly excurved; prickles absent. **Seeds** brown, ovoid, 10-20 mm long; wing twice as long as body.

Montane forests.

Clac, Coos, Curr, Desc, Doug, Jack, Jeff, Jose, Klam, Lake, Lane, Linn, Mari; CA, NV; south to Mexico.

*Pinus lambertiana* is the largest of all pine species. Its large cones, often weighing several pounds, in combination with leaves in clusters of 5, easily distinguish it from all other pine species in Oregon.

*Pinus monticola* Douglas ex D. Don in Lambert

Western white pine

N

**Trees** to 70 m tall; mature crown conic. **Trunks** to 2.5 m in diameter, straight; bark grey, forming scaly plates; branches spreading and ascending; twigs reddish-brown, smooth. **Buds** reddish-brown, ellipsoid to cylindric, resinous. **Leaves** in clusters of 5, blue-green, straight, slightly twisted, 4-10 cm long, 0.7-1 mm wide, margins finely serrulate; abaxial surface without stomatal lines; adaxial surface with stomatal lines; apex acute; sheaths deciduous. **Pollen cones** yellow, ellipsoid, 10-15 mm long. **Seed cones** brown to yellowish, lanceoloid to cylindric, symmetric, 10-25 cm long, pendent, stalks less than 2 cm long, maturing in 2 years, opening at maturity; umbos terminal, depressed. **Seeds** reddish-brown, obovoid, 5-7 mm long; wing about 4 times as long as body.

Montane forests.

Bake, Clac, Coos, Curr, Desc, Doug, Gran, Hood, Jack, Jeff, Jose, Klam, Lake, Linc, Linn, Mari, Mult, Umat, Unio, Wasc; CA, ID, NV, WA; north to British Columbia and east to MT.

*Pinus monticola* is the state tree of Idaho.
*Pinus ponderosa* Douglas ex Lawson var. *ponderosa*

Ponderosa pine

N

**Trees** to 70 m tall; mature crown conic to rounded. **Trunks** to 2.5 m in diameter, straight; bark yellow-brown to reddish-brown, deeply furrowed, forming large irregular scaly plates; branches descending to ascending; twigs orange-brown, roughened by bud scars. **Buds** light brown to reddish-brown, ovoid, resinous. **Leaves** in clusters of 3, yellow-green, straight, slightly twisted, 12-25 cm long, 1.5-2.0 mm wide, margins finely serrulate; all surfaces with fine stomatal lines; apex acute; sheaths persistent. **Pollen cones** yellow to reddish-brown, lance-cylindrical, 2.0-3.5 cm long. **Seed cones** brown to reddish-brown, oblong, slightly asymmetric, 5-15 cm long, horizonta to pendent, stalks less than 2 cm long, maturing in 2 years, opening at maturity; umbo central, raised; prickles straight. **Seeds** brown with black spots, ovoid, 6-9 mm long; wing about 4 times as long as body.

Dry forests (with the exception of trees found in the Willamette Valley).

Throughout Oregon; CA, NV, WA; north to British Columbia.

The number of, and characteristics within, varieties or subspecies of *Pinus ponderosa* varies depending on the authority. Conservatively, however, only one variety of *P. ponderosa* is present in Oregon. *P. ponderosa* var. *ponderosa* is mainly distinguished from other varieties by the number of needles in its clusters, which is consistently 3, as opposed to varieties *scopularum* and *arizonica* which are 2-3 and 4-5, respectively.

*Pinus sabiniana* Douglas ex D. Don in Lambert

Gray pine, foothill pine

N

**Trees** to 24 m tall; mature crown sparse, open and round. **Trunks** to 1.2 m in diameter, straight to contorted or forked; bark dark brown to black, irregularly furrowed with rounded ridges; inner bark orangish; branches usually ascending; twigs brown to black, glaucous, slightly roughened by bud scars. **Buds** ovoid, reddish-brown, resinous. **Leaves** in clusters of 3, dull bluish-green, straight, slightly twisted, 15-30 cm long, 1-2 mm wide, margins serrulate; all surfaces with stomatal lines; apex acute; sheaths persistent. **Pollen cones** yellow, ellipsoid, 10-15 mm long. **Seed cones** light reddish-brown, oblong-ovoid, nearly symmetric, 15-20 cm long, pendent, stalks 1-5 cm long, maturing in 2 years, opening at maturity; umbo continuous with apophyses to form long up-curving claws. **Seeds** dark brown to black, oblong, 1.5-2.0 cm long; wing about 1/2 the length of the body.
Dry mixed forests.

Jack; CA.

Only two *Pinus sabiniana* specimens have been collected in Oregon. Both are from northern Jackson County. A third locality, in southern Jackson County, has been reported by a US Forest Service worker, but currently no voucher exists as confirmation.

*Pinus sylvestris* Linnaeus

Scots pine

*Pinus sylvestris* is widely planted in North America for pulpwood and Christmas trees and has escaped cultivation in many states and provinces. In Oregon, this species has only been documented to have escaped in Wallowa County, although future occurrences are likely. This species is native to Europe and has escaped in many North American states and provinces.

*Pseudotsuga* Carrière

Douglas-fir

*Pseudotsuga* is evergreen; crown conic; topmost shoots generally erect. *Bark* reddish-brown, with resin blisters, smooth when young, becoming furrowed with age; branches whorled,
ascending to slightly drooping, leaf scars flush with twigs. Leaves alternate, flattened, apex bluntly pointed, borne singly, persisting up to 8 years, sheath absent. Pollen cones axillary. Seed cones oblong-ovoid, maturing in 1 season, pendent; scales orbicular, persistent; bracts exserted.

North temperate region.

5 species.

1 species in Oregon.

Commercially, Pseudotsuga is the most important tree genus in Oregon. In the past this genus has been considered a part of Abies, Picea, Pinus and Tsuga. This taxonomic confusion is reflected in both its common name (Douglas-fir) and Latin name, which means false hemlock.

Pseudotsuga menziesii (Mirbel) Franco

Douglas-fir

N

Trees to 100 m; mature crown conic. Trunks to 4 m diameter; bark reddish-brown, smooth when young, becoming thick and furrowed with age; twigs pubescent and orange-yellow when young, becoming glabrous and reddish-brown to gray with age, slender. Leaves usually spreading, yellow-green to bluish-green, linear, flattened in cross section, 1.5-3 cm long, 1.0-1.5 mm wide; abaxial surface ridged and somewhat glaucous; adaxial surface rounded or grooved; apex bluntly pointed, rarely acute. Pollen cones yellow-red to red, 1-2.5 cm long. Seed cones 4-10 cm long, 3-3.5 cm wide; scales orbicular, about 2 cm long, margins slightly irregularly toothed; bracts inversely arrow shaped, 2.5-3.5 cm long, conspicuously exserted. Seeds reddish-brown to dark brown, 5-6 mm long; wing twice as long as seed body.

2 varieties.

Pseudotsuga menziesii is the most commercially important tree in North America. Uses range from pulp, lumber and mulch to Christmas trees. The species is most easily recognized from other coniferous species by the bracts of its seed cones which resemble the tail of a mouse diving into a hole. This species is the state tree of Oregon.

Key to Pseudotsuga menziesii varieties.

1. Seed cones 6-10 cm long; leaves yellow-green..................P. menziesii var. menziesii
1’ Seeds cones 4-7 cm long; leaves blue or grey-green to dark green..........................

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*Pseudotsuga menziesii* (Mirbel) Franco var. *glauca* (Mayr) Franco.

Rocky Mountain Douglas-fir

N

**Trees** to 50 m. **Trunks** to 1.1 m diameter. **Leaves** blue or grey-green to dark green. **Seed cones** 4-7 cm long; bracts spreading.

Coniferous forests east of the Cascade Mountains.

Gill, Gran, Unio, Wall; ID, NV, WA; north to British Columbia, east to WY and southeast to TX and Mexico.

*Pseudotsuga menziesii* (Mirbel) Franco var. *menzeisii*.

Coast Douglas-fir

N

**Trees** to 100 m. **Trunks** to 4 m diameter. **Leaves** yellow-green. **Seed cones** 6-10 cm long; bracts appressed.

Coniferous forests.

Bent, Clac, Clat, Coos, Croo, Curr, Desc, Doug, Gran, Hood, Jack, Jeff, Jose, Klam, Lane, Linc, Linn, Mari, Mult, Polk, Till, Unio, Wall, Wasc, Wash, Whee, Yamh; CA, NV, WA; north to British Columbia.

While the two varieties of *Pseudotsuga menziesii* are occasionally sympatric in British Columbia and Washington, this has not been reported in Oregon.

*Tsuga* (Endlicher) Carrière

Hemlock

**Trees** evergreen; mature crowns pyramidal; uppermost branches usually drooping. **Bark** gray to reddish-brown, scaly, furrowed; branches horizontal and arching downward; twigs usually with rough peg-like projections from previous leaf bundles. **Leaves** borne singly, appearing 2-ranked or radiating in all directions, flattened to 4-sided, set in peg-like projections, sheath absent. **Pollen cones** solitary. **Seed cones** maturing in 1 season, pendent, sessile or on very short stalks. **Seeds** winged.

Northern hemisphere.
Approximately 10 species.

2 species in Oregon.

Hemlocks are most easily identifiable from other coniferous trees in Oregon by their short leaves and conspicuously drooping uppermost branches.

Key to *Tsuga* species

1. Leaves appearing 2-ranked; upper branches of trees very lax and drooping; seed cones less than 2.5 cm long..........................*T. heterophylla*

1’ Leaves radiating in all directions; upper branches of trees moderately dropping; seed cones over 3 cm long..............................................*T. mertensiana*

*Tsuga heterophylla* (Rafinesque) Sargent

Western hemlock

N

Trees to 50 m tall; mature crown narrow pyramidal. Trunks to 2.5 m in diameter; bark gray-brown to reddish brown, smooth, scaly, becoming furrowed with age; branches horizontal, upper branches obviously drooping; twigs yellow-brown, pubescent. Leaves appearing 2-ranked, flattened, 0.8-2 cm long, 1.5-2 mm wide; abaxial surface light green, glaucous, with 2 whitish stomatal bands; adaxial surface bright green, grooved; margins minutely dentate; apex blunt to rounded. Pollen cones brown, globose, 3-4 mm long on a stalk of equal length. Seed cones oblong-cylindrical while immature, ovoid when mature, 1-2.5 cm long, 1-2.5 cm wide, scales ovate, thin and flexible, longer than bracts. Seeds 2-4 mm long; wing about 3 times as long as body.

Coastal to mid-elevation forests.

Bent, Clac, Clat, Colu, Coos, Curr, Desc, Doug, Hood, Jack, Jeff, Jose, Klam, Lane, Linc, Linn, Mari, Mult, Polk, Till, Wasc, Wash, Yamh; ID, WA; north to AK.

*Tsuga heterophylla* can resemble *T. mertensiana*, especially at higher elevations. However, *T. heterophylla’s* 2-ranked appearing leaves and short seed cones are reliable for identification. *T. heterophylla* is the state tree of Washington.
Tsuga mertensiana (Bongard) Carrière

Mountain hemlock

N

Trees to 40 m tall; mature crown very narrow pyramidal. Trunks to 1.5 m in diameter; bark dark gray to reddish brown, scaly, fissured; branches horizontal, upper branches moderately drooping; twigs yellow-brown, glabrous to puberulent. Leaves radiating in all directions, curved near apex, usually flattened, occasionally rounded to 4-sided in cross section, 1-2.5 cm long, 1-2 mm wide; abaxial surface green, glaucous, with faint stomatal bands; adaxial surface green, glaucous, with faint stomatal bands; margins entire; apex rounded. Pollen cones globose, brown, 6-8 mm long on a stalk of equal or slightly greater length. Seed cones oblong-cylindrical, 3-7 cm long, 1.5-3 cm wide, scales obovate, stiff, longer than bracts. Seeds 3-5 (-6) mm long; wing about 4 times as long as body.

Subalpine to alpine forests.

Clac, Desc, Doug, Hood, Jack, Jeff, Jose, Klam, Lake, Lane, Linn, Mari, Mult, Unio, Wall, Wasc; CA, ID, NV, WA; north to AK.

This species exhibits varied morphology dependent on the elevation at which it is found. For example, at high, exposed elevations this species may exhibit a short, prostrate morphology (Krummholz form). Tsuga mertensiana is always readily identifiable, however, by its radiating leaves and cones over 3 cm long.

Taxaceae Gray
Yew family

Small trees or shrubs, evergreen, dioecious. Bark scaly, reddish-brown. Leaves needle-like, simple, alternate, appearing 2-ranked, not in bundles; apex mucronate. Pollen cones globose, yellow. Seed cones arils, open at top, maturing in 1 season, axillary. Seeds partially enclosed by a red aril.

Northern Hemisphere.

5 genera.

1 genera in Oregon.
In Oregon only one genus and species, within this family, is native (*Taxus brevifolia*). Although several other Taxaceae species are widely cultivated none have, thus far, been reported to have escaped.

*Taxus* Linnaeus

Yew

**Small shrubs or trees.** Branches horizontal to drooping; twigs alternate. **Leaves** flexible, persisting for 4-5 years; apex not sharp to touch. **Seed cones** cup-shaped, soft, fleshy, mucilaginous. **Seeds** brown.

North American *Taxus* species, until recently, were of conservation concern as the result of over harvesting. The reason being the bark of the North American members of this genus is a source of pacitaxel, a chemotherapeutic drug used to treat breast and lung cancer. However, this drug is now produced synthetically, eliminating the need to harvest wild stands of *Taxus*.

*Taxus brevifolia* Nuttall

Pacific yew

**N**

**Small trees or shrubs** to 20 m tall. **Trunks** to 1 m in diameter, usually much smaller, often irregular in shape and lacking a distinctive form; bark scaly, shredding; branches horizontal to drooping; twigs green, becoming bright brown with age. **Leaves** linear, flexible, flattened in cross section, 1-2.5 cm long, 1-3 mm wide; abaxial surface pale green, with a yellowish midrib, usually revolute; adaxial surface yellow-green; apex mucronate but soft to touch. **Pollen cones** less than 1 cm long. **Seed cones** red, 0.5-1.5 cm long, thick, fleshy. **Seeds** brownish-red, ovoid, 0.5-1.0 cm long.

Along streams, valley bottoms and lower slopes under the shade of other coniferous trees.

Bent, Clac, Clat, Coos, Curr, Desc, Doug, Gran, Hood, Jack, Jeff, Jose, Klam, Lane, Linn, Mari, Mult, Polk, Till, Umat, Unio, Wall, Wasc, Wash; CA, ID, ID, WA; north to AK and east to MT.

The solitary representative of the family Taxaceae in Oregon, *Taxus brevifolia* is most easily distinguished from other gymnosperms by its red, fleshy arils which are open at the top, exposing the seed.