

What are the Parts of a Tree?

Trees have three main parts - the leaves, the trunk and the roots. The upper part of the tree with the branches is called the **crown**.

Needles or leaves are the part of the tree that make sugar from air and water. They do this by a chemical process called **photosynthesis** in which energy from the sun, carbon dioxide from the air, and water recombine to form sugars and oxygen.

Stomates are tiny holes that control the amount of air that enters and leaves the tree.

Chlorophyll is a chemical that makes leaves green. It is found inside the plant's cells where **chloroplasts** absorb the sun's energy for photosynthesis.

The **trunk** has several layers.

The **outer bark** protects the tree from fire or insects and insulates it from extreme heat and cold.

The **phloem** is the layer of cells that forms a pipeline to carry sugars from the leaves to the rest of the tree. As these cells die, they become part of the outer bark.

The **cambium** is the growing part of the trunk. Each year the cambium produces new phloem and sapwood. These cells grow more slowly in the winter and this slower growth produces the tree's annual rings. These annual rings can help us find the age of a tree. The oldest part of the tree is always on the inside.

The **sapwood** is the pipeline that carries water and nutrients from the roots up to the leaves. As new layers develop, the inner layers die and become heartwood.

Heartwood is dead wood in the centre of the tree. It gives the tree its strength.

Roots have two jobs - to anchor the tree to the earth and to absorb water and nutrients from the soil.

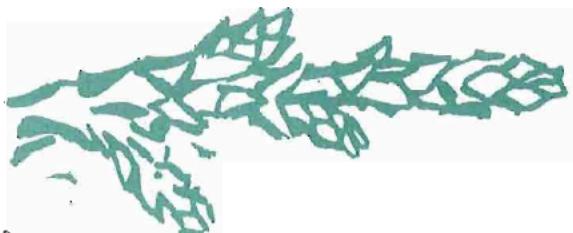
Trees have fungi that live in and on the root cells and help them absorb water and nutrients. In return, the fungi obtain food from the tree.

What to Look For

Many trees look the same from a distance. Up close, you will start to recognize differences, especially if you know what to look for.

What is the shape of the leaf?

Scaly?

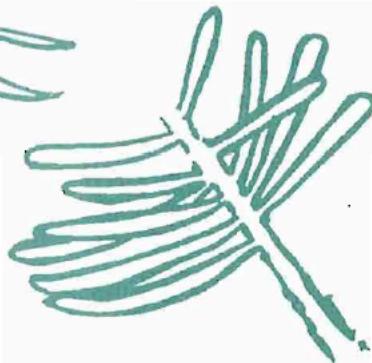


Needle-like?

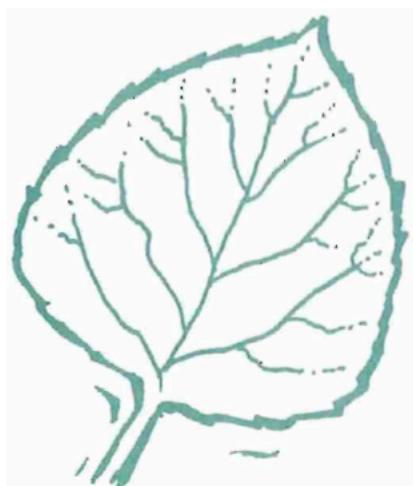
In bundles? If so, how many in each bundle?



Not in bundles?



Broad leaves?

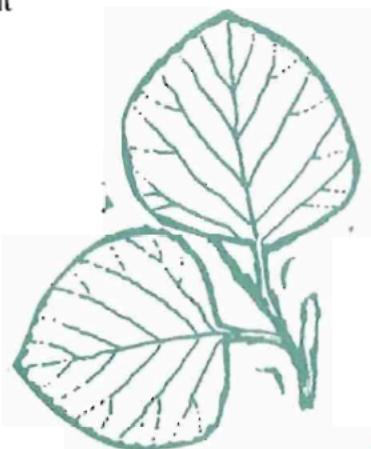


Leaves opposite each other on the twig?



Leaves alternating?

Leaves without
indentations
(not lobed)?



Leaves irregularly
shaped (lobed)?



Where are the seeds?

Berry-like fruit?



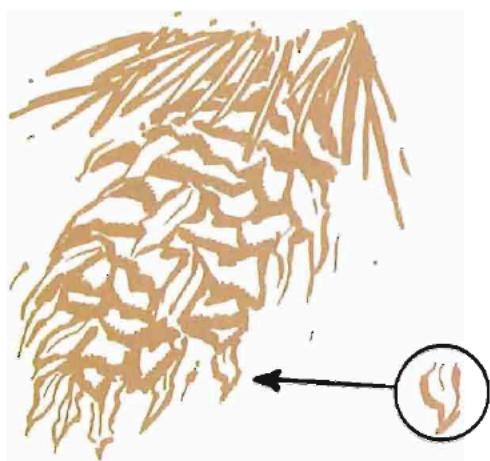
Catkins? (structures
with many flowers)



Cones?



Bracts?



Western redcedar

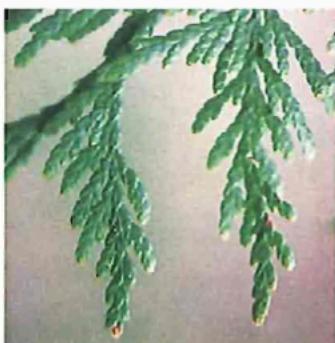
Thuja plicata

A large tree, up to 60 metres tall when mature, with drooping branches; trunk often spreading out widely at the base.



Leaves

Scale-like, opposite pairs, in four rows, folded in one pair but not in the other and overlapping like shingles. Arranged on the twigs in flat, fan-like sprays. Very strong aroma.



Cones

Seed cones are egg-shaped, 1 centimetre long, with several pairs of scales. Pollen cones are small and reddish.

Bark

Grey, stringy, tearing off in long strips on mature trees.

Where to find western redcedar

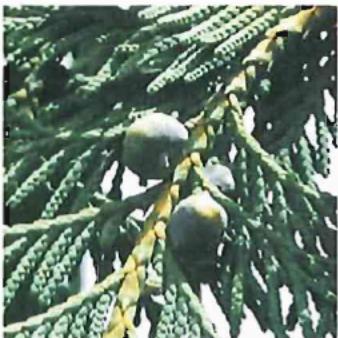
It typically occurs at low to mid elevations along the coast and in the wet belt of the Interior, where the climate is cool, mild, and moist.



Yellow-cedar

Chamaecyparis nootkatensis

A medium-sized tree, up to 24 metres tall and 90 centimetres in diameter; has a broad, grooved trunk that spreads out widely at the base. The crown is sharply cone-shaped, with branches that spread out and droop, and have small, loosely hanging branchlets.



Leaves

Scale-like, dark, bluish-green, and slender with sharp points. Unlike western redcedar, the leaves of the yellow-cedar are all alike, so that the leaf-covered twigs appear four-sided rather than flat.

Cones

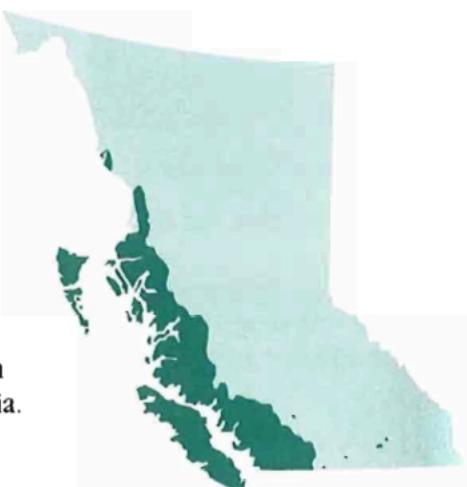
Cones are round, 6 to 12 millimetres in diameter, berry-like in the first year and becoming woody as they mature. Mature cones have 4 to 6 thick umbrella-shaped scales.

Bark

On young trees, the bark is thin, greyish-brown and scaly; on mature trees, it has narrow intersecting ridges. The inside of the bark smells like potato skins.

Where to find yellow-cedar

Common west of the Coast Mountains, it rarely occurs in southeastern British Columbia.



Rocky Mountain juniper

Juniperus scopulorum

A shrubby tree with a wide, irregularly rounded crown and knotty, twisted trunk reaching 13 metres in height.



Leaves

Scale-like, in pairs, barely overlapping but covering the twig in four rows. On young, faster growing branches the leaves may be longer and more needle-like, scattered in twos or threes; pale yellowish-green, turning to greyish-green on older twigs.



Cones

Seed cones are rounded, small, and fleshy, located at the ends of the branches; bright to dark blue with a greyish tinge.

Bark

Divided into narrow, flat ridges that are broken into thin, shredded, stringy strips; reddish- or greyish-brown.

Where to find Rocky Mountain juniper

It occurs most commonly on dry rocky or sandy soils, especially in moist rocky canyon bottoms, along lake and stream shores, and on dry, rocky, south-facing ridges. It generally occurs throughout southern British Columbia, although it has been seen growing as far north as Telegraph Creek.



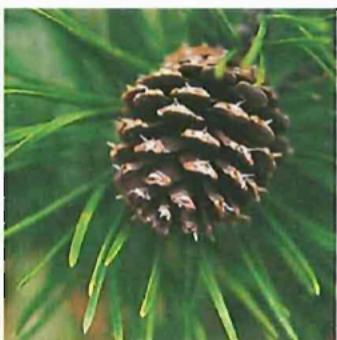
Lodgepole pine

Pinus contorta var. latifolia

A tall, slender, straight tree which grows throughout most of the Interior.

Leaves

Needles occur in bunches of two and are often twisted in a spiral with sharp points; usually dark green.



Cones

Seed cones vary in shape from short and cylindrical to egg-shaped; 2 to 4 centimetres long without stalks. The seed scales have sharp prickles at their tips.

Bark

The bark is thin, orangey-brown to grey, and finely scaled.



Where to find lodgepole pine

It grows throughout the Interior, from mid elevation to subalpine sites.



Whitebark pine

Pinus albicaulis

A subalpine tree that varies in shape from a small tree with a rapidly spreading trunk and broad crown to a shrub with a wide-spreading crown and twisted, gnarled branches when exposed to strong winds. It is similar in appearance to limber pine, but its cones are quite different.



Leaves

Needles occur in bunches of five, ranging from 3 to 9 centimetres long; they are stiff, slightly curved, usually bluish-green, and tend to be clumped towards the ends of branches.

Cones

Seed cones are egg-shaped to almost round, 3 to 8 centimetres long, and grow at right angles to the branch; the scales grow in roughly 5 spiral rows. The cones are permanently closed and the seeds are released when the cones decay on the ground. Seeds are large - about a centimetre long - and wingless.

Bark

Thin, smooth, and chalky-white on young stems; as the tree gets older, the bark becomes thicker and forms narrow, brown, scaly plates.

Where to find whitebark pine

It occurs at high elevations in southern British Columbia.



White spruce

Picea glauca

A large tree with a narrow crown, it can grow to 40 metres tall and 1 metre in diameter when mature.



Leaves

Needles are four-sided, sharp, and stiff, and are arranged spirally on the twigs; whitish-green and foul smelling when young, they become pleasant smelling with age.



Cones

Seed cones are light brown to purplish and hang from the upper branches. The seed scales have a smooth, rounded outer edge. Pollen cones are pale red.

Bark

The bark is loose, scaly, and greyish-brown.

Where to find white spruce

White spruce and its hybrids are found throughout the Interior from valley floor to mid elevations. In the central Interior, white spruce interbreeds with Engelmann spruce and is referred to as interior spruce. The pure species is generally found only north of Dawson Creek.



Engelmann spruce

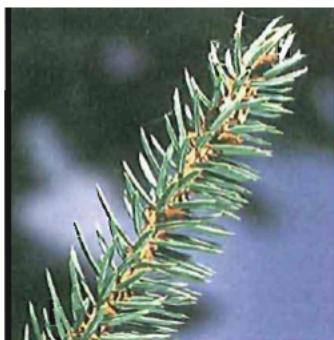
Picea engelmannii

A straight tree with a spire-like crown that can reach 50 metres tall and 1 metre in diameter when mature. Branches near the ground tend to droop.



Leaves

Needles are four-sided and sharp but not particularly stiff. They are deep bluish-green with two white bands on both the upper and lower surfaces. The needles are arranged in all directions on the twigs.



Cones

Seed cones are yellow to purplish-brown and hang from the upper branches. Their papery seed scales are tapered at both ends and have a ragged outer edge. Pollen cones are most commonly yellow to purplish-brown.

Bark

The bark is loose, scaly, and reddish-brown to grey.

Where to find Engelmann spruce

It occurs at high elevations throughout the Interior and along the east slope of the Coast Range. It has been successfully introduced into high-elevation plantations on the west side of the Coast Range and on Vancouver Island.



Black spruce

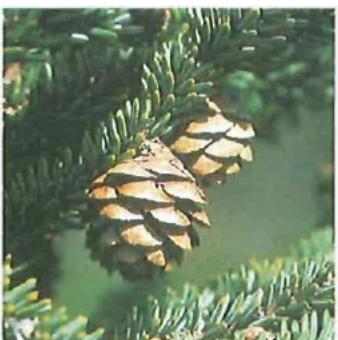
Picea mariana

A small, slow-growing tree, up to 20 metres tall and 25 centimetres in diameter. It often has a characteristic cluster of branches at the top forming a club or crow's nest.



Leaves

Needles are blue-green, short, stiff, and four-sided. The needles are arranged in all directions along the twig or mostly pointing upwards.



Cones

Seed cones are small and purplish. The old cones hang on the tree for several years. Pollen cones are dark red.

Bark

The bark is thin, scaly and dark greenish-brown.

Where to find black spruce

It grows throughout the northern part of the province.



Amabilis fir

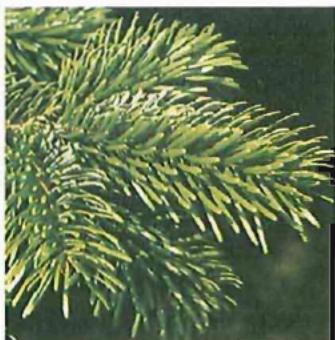
Abies amabilis

A tall, straight tree with a dense cone-shaped crown. It can reach 50 metres when mature.



Leaves

Needles have blunt ends and are usually notched at the tip. They are dark green with a groove on the upper surface and have two silvery bands on the lower surface.



The needles are arranged in flattened, spray-like branches. The long needles spread horizontally from the bottom and sides of the twig while the shorter ones on the top point forward.

Cones

Seed cones are deep purple and are held upright on branches at the top of the tree. The cones fall apart while still on the tree, leaving a central spike that is visible into winter. Pollen cones are reddish.

Bark

The bark is smooth and pale grey with blisters of pitch. It becomes scaly with age.

Where to find amabilis fir

It is usually found in coastal forests above 300 metres elevation. In the north, it may grow at sea level.



Subalpine fir

Abies lasiocarpa

A medium-sized tree usually 20 to 35 metres tall; occasionally grows to 50 metres. Subalpine fir has a distinctive long, narrow crown of short stiff branches.



Leaves

Needles have blunt ends and are often notched at the tip. They are blue-green with a single white band on the top and two beneath. Needles all tend to turn upwards, but often a few stick out from the underside of the branch.



Cones

Seed cones are deep purple and grow upright at the top of the crown. Like the cones of the other firs, they disintegrate on the tree, leaving a central spike. Pollen cones are bluish.

Bark

Smooth and grey, with resin blisters when young; bark becomes broken into large scales with age.

Where to find subalpine fir

It grows well at high elevations, from 600 to 2,250 metres throughout most of the Interior. It also grows near sea level on the north coast. None of the true firs grow in the Queen Charlotte Islands.



Western hemlock

Tsuga heterophylla

A large tree, it usually grows 30 to 50 metres tall. It has a rather narrow crown and conspicuously drooping new growth at the top of the tree. It has mostly down-sweeping branches and delicate feathery foliage.



Leaves

Needles are nearly flat, glossy, and soft; yellow to dark green on the upper surface and whitish underneath. The needles are unequal in length and produce feathery, flat sprays.



Cones

The small, numerous seed cones are greenish to reddish-purple and turn brown with age.

Bark

Dark brown to reddish-brown, becoming thick and strongly grooved with age.

Where to find western hemlock

It grows along both the east and west sides of the Coast Ranges, from sea level to mid elevations, as well as in the Interior wet belt west of the Rocky Mountains.



Mountain hemlock

Tsuga mertensiana

A subalpine tree with only a slightly drooping leader or top; rarely grows more than 30 metres tall and is often stunted at high elevations.



Leaves

Needles are uniform in size, glossy, and yellow-green to deep bluish-green. They cover the branches densely on all sides or may be mostly upturned.



Cones

Seed cones are light to deep purple (sometimes green), narrow at each end and longer than those of western hemlock. Pollen cones are bluish.

Bark

Dark reddish-brown, cracked and grooved into narrow ridges.

Where to find mountain hemlock

It grows at mid elevations to timberline in the coastal mountains and at low elevations further north. In the Interior, it grows in the Cariboo, Selkirk and Monashee mountains.



Douglas-fir

Pseudotsuga menziesii

A large tree, reaching heights of 85 metres on the coast and 42 metres in the Interior. Older trees have a long, branch-free trunk and a short cylindrical crown with a flattened top. There are two varieties of Douglas-fir - coastal and Interior.



Leaves

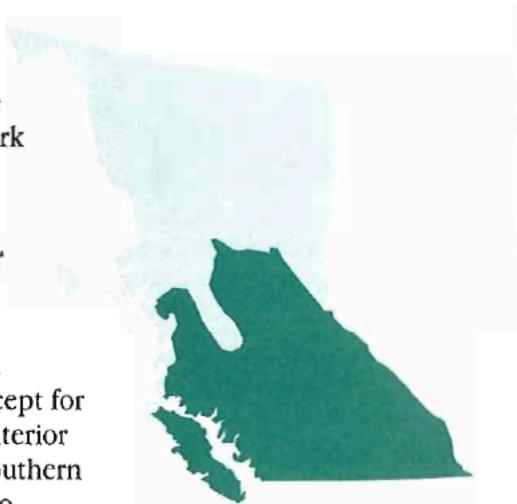
Needles are flat with a pointed tip. The upper surface is bright yellowish-green with a single groove down the centre; the lower surface is paler. The needles appear to stand out around the twig.

Cones

Cones are 5 to 11 centimetres long, turning from green to grey as they mature. Between each scale, long three-pronged bracts are easily seen. Seeds are winged at the tip.

Bark

Smooth, grey-brown, with gummy resin-filled blisters when young, the bark becomes very thick with age and deeply grooved, with dark reddish-brown ridges.



Where to find Douglas-fir

The coastal variety of Douglas-fir occurs along the southern mainland coast and across Vancouver Island, except for the very northern tip. The Interior variety occurs throughout southern British Columbia and north to Takla Lake.

Western yew

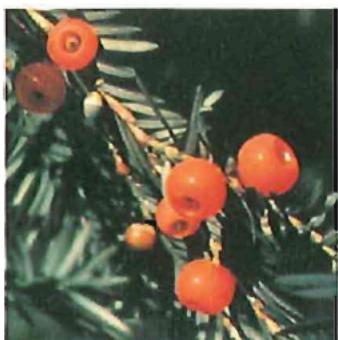
Taxus brevifolia

A low spreading shrub to a small tree, 5 to 15 metres tall; young trees are often square in profile, becoming more cone-shaped with age. The trunk is twisted and becomes very wide near the base, with horizontally spreading branches.



Leaves

Needles are flat, about 2 centimetres long, with a distinctive pointed tip; dark yellowish-green, arranged spirally on twigs but twisted so that they appear to grow in two rows.



Cones and Fruit

Seed and pollen cones usually appear on separate trees. The fruit consists of a coral-red fleshy cup that is open at one end and contains a single seed.

Bark

Thin, dark reddish or purplish scales shed off the trunk and expose a rose-coloured underbark.

Where to find western yew

It occurs scattered throughout the wetter forests of the coast and the Interior wet belt, primarily at low to mid elevations.



Douglas maple

Acer glabrum

A shrub to small tree, 1 to 7 metres in height; the trunk may be divided into a few slender limbs; these are further divided into many small branches to form an irregular and even-topped crown.



Leaves

Leaves are 7 to 10 centimetres wide, divided into 3 to 5 lobes, and have a typical maple-leaf shape. They are coarsely toothed, dark green on top and greyish-green underneath, turning bright red-orange in autumn.



Fruit

The fruit consists of a cluster of winged seeds, joined in pairs at a sharp angle in a V-shape. The seed wings are about 2.5 centimetres long, and the seeds are strongly wrinkled and indented.

Bark

Generally thin, smooth, and dark reddish-brown; roughened on larger branches and old trunks.

Where to find Douglas maple

It is widespread at low to mid elevations throughout most of British Columbia, except in the Queen Charlotte Islands and northern British Columbia.



Black hawthorn

Crataegus douglasii

A large shrub to small tree that grows up to 8 metres tall, armed with stout, straight thorns 1 to 2 centimetres long and bearing showy, white flowers during May and June.



Leaves

Oval leaves are 3 to 6 centimetres long, with 5 to 9 small lobes at the top.



Flowers

White, saucer-shaped flowers in flat-topped clusters.

Fruit

Clusters of small, blackish "apples" (haws) that wither quickly when ripe.

Where to find black hawthorn

It is found from sea level to mid elevations south of Fort St. John, along water courses and meadowland thickets.

The Columbian or red hawthorn (*Crataegus columbiana*) is a smaller tree or shrub with long slender thorns and red fruit. It also grows along water courses and on dry hillsides in the southern Interior. The English hawthorn (*Crataegus oxyacantha*), an ornamental garden tree, is naturalized on the southern coast. Its leaves are deeply lobed, and the fruit is red.



Red alder

Alnus rubra

A medium-sized broad-leaf tree, up to 24 metres tall. Trees growing in the forest develop a slightly tapered trunk extending up to a narrow, rounded crown. Trees in the open have crowns that start near the ground giving it a broad cone shape.



Leaves

Bright green above and greyish underneath. They are oval-shaped, with pointed tips, and coarsely toothed edges that tend to curl under. The hair-covered veins form a ladder-like pattern. Leaves stay green until they drop off.

Flowers

The flowers occur as either male or female clusters. Male flowers are in long, drooping, reddish catkins, and female flowers are in short, woody, brown cones.

Fruit

The female cones are oval-shaped, 2 centimetres long. The seed is a narrow winged nutlet.

Bark

Thin, greenish on young trees, turning grey to whitish with age. The inner bark and fresh wounds tend to turn deep reddish-orange when exposed to air.



Where to find red alder

It occurs along the entire coast of British Columbia.

Paper birch

Betula papyrifera

A small to medium-sized tree, often with many stems, up to 30 metres tall. In forests, it has a slender trunk that often curves before extending to the narrow, oval-shaped crown. In the open, the crown is pyramid-shaped.



Leaves

Triangle- or egg-shaped, about 8 centimetres long, and doubly toothed; dull green on top, paler with a soft down underneath.

Flowers

The flowers are either male or female and are in narrow catkins. Female catkins are 2 to 4 centimetres long, standing erect at the tip of the branch. Male catkins are longer and hang below the branch. The flowers appear before or at the same time as the leaves.

Fruit

The nutlets have wings broader than the seed. Each tree produces thousands of seeds.



Bark

Thin, white to reddish-brown, with dark horizontal slits (lenticels). It peels in papery strips, exposing reddish-orange inner bark which will gradually turn black with age.

Where to find paper birch

It is found throughout British Columbia but only in a few scattered places on the outer coast.

Water birch

Betula occidentalis

Varies from a small coarse shrub to a small tree up to 10 metres high; most commonly shrubby, with several spreading trunks.



Leaves

Oval-shaped, broadest below the middle, slightly tapered towards a blunt or sharp tip; 2 to 5 centimetres long. The edges are thin, doubly-toothed. The leaf surfaces are shiny, yellowish-green above and paler, dotted with fine glands underneath.



Fruit

Tiny, hairy nutlets with wings broader than the seed. Thousands of seeds are produced from each tree.

Bark

Thin, shiny, dark reddish-brown to black, with marked horizontal slits (lenticels); does not peel like other birches.

Where to find water birch

It occurs frequently in southern British Columbia, east of the Coast and Cascade mountains; rarely found in the north or in mountainous areas.





Black cottonwood

Populus balsamifera ssp. *trichocarpa*

Balsam poplar

Populus balsamifera ssp. *balsamifera*



These hardy, straight-trunked trees have large, sticky, fragrant buds. On the coast, black cottonwoods can reach 50 metres tall, but balsam poplars usually reach only 25 metres.



Leaves

Shiny, dark green leaves are 6 to 12 centimetres long, pale underneath and often marked with brown. They vary from oval to wedge-shaped and have a sharply pointed tip.

Flowers

Male and female catkins are on separate trees. Male catkins are small, 2 to 3 centimetres long and female catkins are larger, 8 to 20 centimetres long.

Fruit

The hairy capsules open to release seeds which are covered with white, fluffy hairs.

Bark

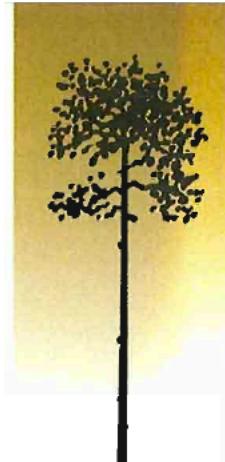
The bark is smooth, yellowish-grey on younger trees, but grows thick and deeply grooved with age.



Trembling aspen

Populus tremuloides

A slender, graceful tree with smooth, greenish-white bark; grows up to 25 metres tall; distinctive leaves that quiver in the slightest breeze.



Leaves

Smooth, round to triangular-shaped leaves with a flattened stalk that is longer than the leaf. They are dark green above, paler underneath and turn golden yellow or red in the fall.



Flowers

The flowers are borne in male and female catkins on separate trees. Male catkins are small, 2 to 3 centimetres long, and the female catkins are larger, 4 to 10 centimetres long.

Fruit

Tiny capsules covered with cottony down.

Bark

Smooth, green and doesn't peel.

Where to find trembling aspen

It is found throughout the province east of the Coast Ranges, with a few scattered trees around the Strait of Georgia. Aspen is very common in the northeastern part of the province.

