Chapter 17 - "Common BC Coniferous Trees"

In this chapter, we'll examine some common coniferous tree species that you'll need to be able to identify when planting in BC. I'm going to cover the three species groups that you'll most commonly encounter in the northern Interior. I'll also talk in less detail about species that you're less likely to encounter in your first year of planting, but which are commonly planted in the Southern Interior or on the coast. Later in the chapter, I'll also reference trees that are commonly planted in Ontario, Quebec, and the Maritimes.

First, let's make sure that we all understand some basic scientific and non-scientific terms for certain groups of trees. Coniferous and deciduous are two scientific terms. Some people with a basic knowledge of trees think that these terms are opposites, and that all trees are either coniferous or deciduous. Strangely enough, that's not quite correct. I'll explain that in a minute.

Conifers are trees that are cone-bearing. Examples include pine, spruce, fir, cedar, hemlock, larch, and tamarack. Coniferous trees have needles instead of leaves. In most cases, these needles stay on the tree even during winter.

Figure 17.01
Tree Cones.

Tree cones come in many different shapes and sizes, although the ones in this photo all come from the same species. Did you know that conifers have two different types of cones? There are pollen cones and seed cones.

When I was a kid, I referred to every type of cone as a "pine cone," no matter what the species. Dumb kid. Every species of conifer has cones, and they should be referred to by their correct family names, ie. pine cones, spruce cones, fir cones, etc. If you don't know the exact species or family, just call it a "cone."

Deciduous is based on a Latin term and means "falling off at maturity," so this term refers to trees or shrubs that lose their leaves seasonally. Most deciduous trees don't have cones. They can have all

kinds of different types of seeds, from the paired propeller seeds of the maple, to the familiar small pitted seeds found in an apple, to acorns and chestnuts, to the fine light powdery fluff of the trembling aspen. Most deciduous trees have leaves instead of needles.

Evergreen is a colloquial term that refers to "trees that still look green during the winter." Evergreens are almost exactly the same as coniferous trees, because most coniferous trees do not shed their needles in the winter, thus they are "ever green." However, the larch is an exception. The larch is the only coniferous that sheds its needles each fall, and grows new needles in the spring. Therefore, the larch is coniferous but is NOT an evergreen. The tamarack is a type of larch, although some people use the term interchangeably with all larch trees.

This leads to an interesting question. If larch and tamarack lose their needles each year, are they considered to be deciduous? Yes, they are. They're in a rare category called deciduous conifers. They lose their needles each winter, and they have cones. There are a couple other species of deciduous conifers in North America, although I believe that the larch is the only example that grows in BC.

Figure 17.02
A Mixed Pine/Larch Plantation in the Fall.

The larch trees in this photo have yellow needles, which will drop off within a few weeks. They will grow a new set of needles in the spring. The pine trees will keep their needles all winter.

Broadleaf is another somewhat unscientific term. It refers to trees with wide leaves instead of needles.

You'll hear about hardwoods and softwoods sometimes, especially with respect to lumber or firewood. This refers to the density of the wood. Of course, the density of different trees covers a huge range, not just two specific types or measurements, so you'll have some softwoods that are denser than others, and you'll have softer hardwoods. Basically, hardwoods come from angiosperms, which means that they're flowering plants. This covers the broadleaf deciduous trees, like birch, oak, elm, chestnut, aspen, cottonwood, and so on. A gymnosperm tree is one that has seeds that are unprotected by an ovary or fruit. Most softwoods are gymnosperms, including conifers like pine, spruce, and fir.

When you first start planting, if you're at one of the companies planting in northern BC, you'll probably only be planting two species groups at least 95% of the time: pine and spruce. Sometimes, you'll be planting only one species on a block, which is referred to as a monoculture. At other times,

you'll be mixing species. Of course, within BC, there are several types of pine and several types of spruce. The same applies to firs, cedars, and other species. We'll get to that in a few minutes.

Identifying the species of the seedlings that you're planting is usually not too difficult. That's because your boxes of trees are labeled. However, you'll need to learn to identify the species of a seedling by sight, not by a label on a box. Also, seedlings start to look a little bit different as they start growing into real trees. This matters because you'll also need to be able to identify the types of trees growing on the block. This is tricky because your seedlings don't always have a uniform appearance, and also because there might be half a dozen different species that are growing naturally on a block. You'll have to learn to identify them all. We'll start small, but make no mistake, this is important.

Trees and plants can be identified by a number of means, including their form, bark, cones, buds, wood structure, and more. Identification by leaves or needles is a good start. However, some things like the characteristics of the buds can really give you some extra clues. You'll be working mostly with young trees, called seedlings. When you're looking at naturals on the blocks, you'll see a mix of germinants, seedlings, and saplings. A germinant is a naturally-growing tiny tree that's just starting to grow, so it's as small as or even smaller than the seedlings that you're planting. Let's say that a germinant is probably less than three to six months old, and probably less than six inches in height. Seedlings, whether naturally occurring or from the nursery, are usually between several months and two years old, and perhaps between six inches and a few feet in height. Saplings are young trees between about two years and ten to twelve years in age, which can range in size from knee-height to being taller than the planters. Juvenile trees is a broader term that encompasses both seedlings and saplings. There are obviously a few grey areas in determining exactly what to call immature trees at various stages in their growth cycle.

A shrub (or bush) is a woody plant which is somewhat similar in physiology to a tree, although it is usually smaller (rarely more than six meters in height at maturity). Shrubs have woody stems, but there are usually multiple stems rather than a single trunk.
For first-time planters in the northern parts of BC, if you can learn three species, you'll do fine. These are pine, spruce, and fir. Unfortunately, from this point, it's going to get confusing really fast.

Pine

There are over 120 species of pine around the world, including dozens in North America. There are four types of pines planted commonly throughout BC. Pines are easy to distinguish. Lodgepole pine is the king, and it's essentially the only pine planted in the northern half of the province. When you think of pines, think of pioneers. Pine trees are not shade tolerant. They like to grow out in fresh openings on new cut-blocks, rather than in the shaded understory of an existing forest. Lodgepole is called the "two needle pine" because it's the only type of pine where the needles occur in pairs.

If you're planting in the Interior, you'll see Lodgepole Pine abbreviated as Pl or Pli (think Pine, lodgepole, Interior). If you're planting on the coast, you'll see it abbreviated as Pl or Plc (think Pine, lodgepole, coastal).

Planters in northeastern Alberta, the Prairies, Ontario, Quebec, and the Maritimes will usually be planting Jack Pine rather than lodgepole, as the range for lodgepole pine only extends from the Pacific into most parts of Alberta. Very large quantities of Jack pine are planted in Canada each year. Planters in the Maritimes, southern Quebec, and southern Ontario might also plant Eastern White Pine, which is a majestic tree at maturity.

Pine trees can be identified easily because they usually have much longer needles than spruce, fir, and other species. Pine needles are usually at least 5cm long in mature trees, often closer to 8cm. Also, the needles are relatively sparse due to their size. In young seedlings, pine are the floppiest trees you'll plant, so sometimes you need to take a bit of extra care to keep them planted reasonably straight. The needles are probably the softest of all the coniferous trees. Pine needles are usually a rich green colour, maybe with a tinge of yellowish. The bark is smooth in young trees, but thick and scaly in mature trees. Probably about half of the seedlings planted in northern BC are pine.

Figure 17.03
Needles on a Pine Tree.

This is one of many possible species of pine trees.

Pine trees do great in sandy, well-drained soils. They'll still grow in wet ground, however, it's just not what they'd prefer. Pine cones often need a lot of heat to crack open. Usually, when a forest fire sweeps through a pine plantation, the heat from the fire will pop open many of the cones and release the seeds to start a crop of young trees. It can sometimes get also hot enough at the surface of an exposed cut block in the summer to pop the cones open.

Pine is one of the most valuable commercial species, used for both lumber and pulp. Generally speaking, pine is used for higher-value carpentry items such as furniture, panels, wood frames, floors, and roofing. Pine has no natural decay-resistant or insect-resistant properties, so it is almost always used for indoor carpentry.

Tree planters generally prefer planting pine trees, even though they're floppy. This is because they're generally lighter and smaller than spruce trees. Also, the needles are soft, so they don't prickle planters' arms, or give you a rash like spruce trees can.

Figure 17.04
Bundles of Lodgepole Pine.

Pine seedlings are generally nice to plant. They have floppy stems, which is annoying, but they have soft needles and they're usually fairly light.

Figure 17.05
Young Pine Tree.

The light dusting of early-morning snow on this juvenile pine doesn't hide the fact that lodgepole pine trees have a very distinct sparse form with fairly long needles.

The Mountain Pine Beetle infestation has devastated around sixty percent of the pine forests across BC over the past decade or so. Some people say that we should plant more pine to replace the pine that's been killed. Some people say that we should plant less pine, because the beetles will just kill it eventually. No matter what contract you're on, a pine natural is almost always considered to be an acceptable natural if it's in good shape.

Spruce

There are about thirty-five types of spruce worldwide, but only about five types are planted commonly throughout BC. These are a bit more confusing, because they don't have a dominant sub-species. White spruce and Engleman spruce are both planted in moderate amounts as pure species. However, there's a certain type of hybrid that's sometimes called Interior spruce, which is probably planted most commonly. There's also Black spruce, which is the most water-tolerant of the spruce varieties, so it's usually planted on swampy or wet blocks. It doesn't grow to be as large or healthy as the other types. If you're going to a block prescribed for mostly black spruce, you can assume that it might be a bit nastier than your average block.

If you're planting Interior hybrid spruce, you'll often see it abbreviated as Sx. White spruce is Sw, Black spruce is Sb, and Engleman spruce is Se.

Spruce is a very important species in reforestation in BC's Interior, especially in the northern half. I'd estimate that probably over 45% of seedlings planted in northern BC are spruce. Spruce trees are fairly shade-tolerant. They grow more slowly than pine, but they eventually overtake pine in height after a few decades. As seedlings, they have very straight stems. You'll have to make sure they're standing straight when you plant them, because you won't be able to blame a lean on the floppiness of the tree.

Spruce trees are quite tolerant of high moisture levels in the soil, so you'll often see foresters asking you to plant spruce in depressions and low areas of blocks. Again, if you get into truly swampy ground, black spruce will probably be a better choice than other varieties, if you have a choice.

When spruce is sold as lumber, it's less expensive than pine. It's often used for general construction purposes, such as for studs, plywood, framing, etc. It's also used in the production of several types of musical instruments. Spruce does not have any decay-resistant or insect-resistant properties, so it isn't suitable for outdoor use unless it's been painted or treated.

Planters usually find it difficult to tell spruce trees and fir trees apart, because they look fairly similar. Let me give you a few hints that will help you identify a spruce:

- Spruce needles are four-sided. You can "roll" them between your fingers easily.
- Spruce needles are prickly at the tips. If you grab a spruce branch and squeeze it, it'll feel uncomfortable.
- Spruce needles grow out in all directions from a twig on a branch.
- Spruce needles sometimes, but not always, have a bit of a bluish tinge to them.

Figure 17.06
Needles on a Spruce Tree.

Spruce needles are prickly. Visually, they can be identified because they grow out in all directions from the branchlets. You can "roll" spruce needles easily between your fingers.

Figure 17.07
A Spruce Tree and a Pine Tree.

The spruce tree in the left side of this photo looks markedly different than the pine tree beside it.

Spruce is almost always considered to be an acceptable crop tree, so you'll probably have to space off spruce naturals if they have good form and vigor. Form refers to the shape of the tree, and vigor refers to whether or not it looks healthy.

Fir

There are five species of fir found in British Columbia. These can be divided into the balsams, which are true firs, and the two species of Douglas Fir. The Douglas Firs are false firs, although they're quite close to true firs. Subalpine fir, which is much more commonly known as "balsam fir" or just "balsam," is the type of fir that first-year planters need to be most aware of. The needles are three-sided, technically, although you'll only notice that if you examine them very closely. It's easier to say that effectively, they're fairly flat. If you look really closely, you might also notice that the needles have a notch at the tip, and have whitish lines on both sides.

Figure 17.08
Needles on a Balsam Fir.

Balsam fir needles look like spruce needles, but they're a lot softer if you grab them. They don't roll easily between your fingers, and the majority of the needles grow out from the upper area and the sides of the branchlets, with very few needles growing on the underside.

Once you start getting further south in BC, you might start to encounter Interior Douglas Fir. The needles on a Douglas Fir are also fairly flat, although they have a pointed tip instead of a notch. The upper surface is bright yellowish-green if you're looking at an Interior Douglas Fir, although on the coast they're more bluish. There should be a single groove down the center. The easiest way to determine if a young tree is a Douglas Fir or a Balsam is to look at the little buds and also at the

needles. If the buds and needles are pointed, it's a Douglas Fir. If the needles are notched and the buds are rounded, it's a Balsam.

Figure 17.09
Needles on a Douglas Fir.

Needles on a Douglas Fir look somewhat similar to spruce or balsam fir, but maybe a bit thinner, and slightly closer to pine (although the needles usually aren't nearly as long as pine needles).

If you're planting in the Interior, Douglas fir is abbreviated Fd or Fdi. On the coast, it's either Fd or Fdc. Balsam is abbreviated Bl.

All of the fir trees, like pine, are considered to be pioneers. They grow quickly after fires. You'll also notice a lot of young balsam fir growing alongside a lot of ditches, where they get more sunlight than in under the canopy.

When trying to differentiate between a spruce and a fir, these tricks will help you:
- Fir needles do not roll easily between your fingers, since they're almost flat.
- Fir needles are fairly soft. If you squeeze a branch, it won't be as prickly as a spruce.
- Fir needles grow from branches in a sort of fan-like pattern. Look at the bottom of a branch. If it's bare, it's probably fir. The needle pattern will be flatter on the top than with a spruce bough.
- In the Interior, Fir trees are usually more yellowish/greenish tinged than spruce, although this isn't always a reliable test.

It's important to be able to tell Douglas Fir apart from Balsam, because of their financial worth. A balsam isn't worth nearly as much as a Douglas Fir. You'll usually be instructed not to treat Balsam Fir as an acceptable crop species. In other words, don't space off it, if you encounter one while planting. Douglas Fir on the other hand are quite valuable, so you'll almost always be told that it's an acceptable crop tree, and you'll be expected to space off it.

If you can't tell whether a tree is a balsam fir or a Douglas fir from the needles alone, the dead giveaway is the buds. If the buds have somewhat rounded tips, they're balsam fir. If the buds have pointed tips, they're Douglas fir.

Figure 17.10
Buds on a Douglas Fir.

Douglas Fir are easy to identify if you get up close, because the tips of the buds are very pointy. That's a point that you shouldn't forget.

Figure 17.11
Douglas Fir Seedlings.

The buds on these Douglas fir trees can be seen all over the stem of the seedling, not just on the top.

Other Important Species

In the Interior, especially in the northern half of BC, you're mostly going to be planting either pine or spruce, or a mix of the two. As you move further south, you might see Douglas Fir, Balsam Fir, and a few other species added to the mix (perhaps larch and cedar). Once you get to the coast, it's not uncommon to be planting five or six species simultaneously, although red and yellow cedar are often the dominant species. Here's a more detailed list of some of the species that are planted throughout BC (and of course, other provinces have different species lists even though types of pine and spruce are dominant right across Canada). If you're a first-year planter, don't worry about memorizing these.

Amabilis Fir (Ba) – Similar to balsam, and grows in low elevation coastal areas.
Grand Fir (Bg) – Grows in lower elevations on the southern coast & in the Kootenays.
White Spruce (Sw) – Mostly found in pure plantations north of Dawson Creek.
Sitka Spruce (Ss) – A low elevation, coastal spruce.
Engleman Spruce (Se) – Grows at high elevations.
Yellow Pine (Py) – Three needle pine, found in lower elevations in the Southern Interior.
Western White Pine (Pw) – Five needle pine, found on the coast & in the Southern Interior.
Whitebark Pine (Pa) – Five needle pine, bluish-green, high elevation Southern Interior.
Western Hemlock (Hw) – Top branch of tree droops, coastal & Interior wet-belt.

Mountain Hemlock (Hm) – Higher elevations than Western Hemlock.
Western Larch (Lw) – Northern BC, needles in bundles of 15-25.
Tamarack (Lt) – Northern BC, needles in bundles of 15-25.
Western Red Cedar (Cw) – Very common coastal and Interior wet-belt species.
Yellow Cedar (Yc) – Coastal, bright yellow-green colour, seedlings sometimes look plastic.
Paper Birch (Ep) – Hardwood, grows all over BC, bark peels off in strips.
Trembling Aspen (At) – A soft hardwood, found all over BC, leaves tremble in light wind.
Black Cottonwood (Act) – Shiny, waxy oval or wedge-shaped leaves, sticky buds.
Bigleaf Maple (Mb) – Winged seeds, only found in the southwest corner of BC.
Red Alder (Dr) – Coarse toothed edges on leaves, woody catkins, grow in coastal areas.

You may also come across Juniper bushes on some of your blocks. The juniper berry, when fermented, is used as the basis for gin. If you find one of these plants and squeeze the berry (even while it is still white or a pale pink/green), it will give the characteristic smell of gin. Juniper shrubs are evergreen, and are typically low-height bush-type plants. Several species of junipers are commonly used for ornamental purposes in landscaping.

Figure 17.12
Juniper Bushes.

Juniper bushes grow low to the ground. They look like conifers, because they are. There are several dozen distinct species of juniper. Some juniper species actually grow into tall trees.

Figure 17.13
Juniper Berries.

Juniper berries are used to make gin. Crush one between your fingers and smell it.

If you're planting in Ontario, Quebec, or the Maritimes, species identification is not as important as it is in BC. Also, you'll find that different species are planted than in BC. When you're in central or Eastern Canada, expect to see trees such as the Jack pine, red pine (also known as Norway pine), eastern white pine, balsam fir, eastern hemlock, eastern larch (tamarack), Norway spruce (imported), and very commonly, black spruce and red spruce.

If you want to learn more about the plants and trees you'll discover on your blocks, look for one of two books: "Plants Of Southern Interior British Columbia" by Robert Parrish (easy to find), or "Plants of Northern British Columbia" by Andy MacKinnon (hard to find). Another book is "A Field Guide To Western Trees: Western United States and Canada" by George A. Petrides & Roger Tory Peterson.

If you're working in central or Eastern Canada, you might be interested in getting a copy of "A Field Guide To Eastern Trees: Eastern United States & Canada, Including The Midwest" by George A. Petrides & Roger Tory Peterson, or "Identifying Trees Of The East: An All-Season Guide To Eastern North America" by Michael D. Williams.

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