Chapter 18 - “Prescriptions & Planning”

In this chapter, we're going to learn some information that relates to the Planting Prescription. You may never see a prescription on paper, but the forester will give you certain information, either directly or through your crew leader, which guides your planting style by clarifying certain specifications. Most of this information will be given to you at a meeting that's called a pre-work conference, and then you'll get additional feedback on the blocks as various people are checking the quality of your planted trees.

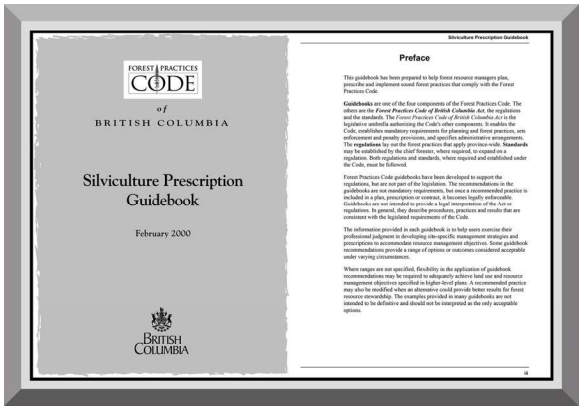

Figure 18.01
BC’s Silviculture Prescription Guidebook.

This guidebook is a free publication of the province government.
Source: BC Government.

Assessing a Block

When looking at a block and deciding how easy it will be to plant, there are a surprising number of characteristics that can differentiate it from other blocks, such as the geography, slash, and soils.

In terms of geography, important things to consider include the elevation, the slope (how level it is), and the topography (whether it is a rolling or flat surface). If the block is sloped, the aspect affects how soon the snow will melt off in the spring, because south-facing aspects lose their snow fastest. The ratio of block size to the length of roads, and also the placement of those roads, are important. The road network on a block usually determines where caches will be placed, and how easy it will be for planters to access all parts of the block.

In terms of the surface, the amount and average size/length of the slash is particularly important, as is the height of this slash above the ground. Are the woody debris coarse or fine? How green is the block, and what types of grass, brush, and vegetation are present? Different types of vegetation

cause variations in difficulty of planting. The time of year that the block was harvested can also affect the planting. If the block was harvested in the winter, the vegetation might have been somewhat protected by the snow, and thus might be more resilient.

In terms of soils, the biggest question is whether or not there is a lot of rock in the ground. If so, what kind is it: cobble, regular stones, slate, or gravel? Is there a lot of soil, or is it mostly black organics? If soil is present, is it red/brown mineral soil, or powdery grey, or heavy in clay content? Is there any sand? Is the soil well-drained, or will it hold a lot of moisture?

All of these questions are related to the way that a tree planter looks at a block. A forester looks at many of the same characteristics when thinking about the best way to eventually return the block to mature forest. However, a forester also considers a number of other factors relating to biology, ecology, hydrology, and many other nuances of the ecosystem that a planter might not care about.

The Pre-Work Conference

At the start of a contract, the planters need to be told exactly what requirements and preferences are in effect for the current contract. These requirements and preferences are usually referred to as the specs, which is short for specifications. The forester will often hold a pre-work conference with the crew to outline the specs. In some cases, the foresters prefer not to try to communicate this information with such a large group of people at one time, so instead they'll have a pre-contract meeting with the staff and management of the company, to go over the specs in detail with the camp supervisor, the crew leaders, and the quality checkers or tree runners. The staff are then expected to have a subsequent meeting with the planters to pass on this information, and to ensure compliance with the client's expectations. Part of your job as a planter is to pay attention to the planting requirements, and understand what is being asked of you.

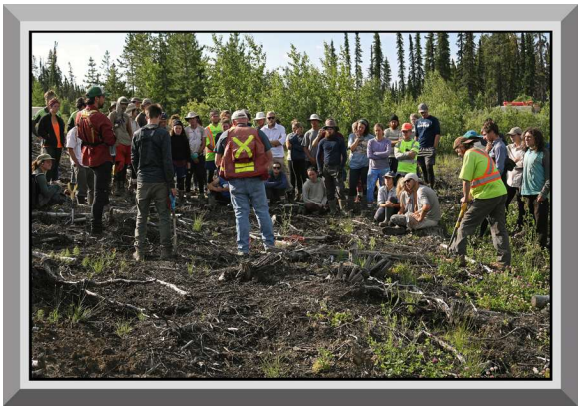

Figure 18.02
A Pre-Work Conference With Planters.

The entire crew is present at this meeting, so the forester can communicate planting specs.

Some topics covered in a pre-work can include: Safety, EMS requirements with respect to creek crossings and other issues, stock-handling, and planting specs. Some planting specs covered in a pre-work can include: Depth preferences, target spacing, minimum spacing, excess fines, species mixing, tolerance for leaners, screefing requirements, microsite selection, and much more.

Figure 18.03
A Pre-Work Specifically for Management.

Sometimes, it's easy for the foresters to talk to a smaller group that contains all the management personnel, and then the management team can work with the planters to ensure that they understand all of the planting specs.

The Silviculture Prescription & the Planting Prescription

The silviculture prescription and the planting prescription are not the same thing. They are two separate site-specific plans. The silviculture prescription is an overall document that describes the forest management objectives for an area. It also covers the methods for harvesting the existing stand. If you do a google search for "silviculture prescription guidebook bc" you'll find a detailed document produced by the Ministry of Forests, Lands and Natural Resource Operations, showing exactly what is included in a comprehensive Silviculture Prescription document.

The planting prescription is a specific part of the overall silviculture prescription plan that focuses on just the planting specs. Some of the specs in this plan will relate to things such as screefing, obstacle planting, specific microsite requirements, density specs, quality specs, fertilization, browse protection, and more. Let's look at these in more detail.

Screefing involves using your shovel or boot to remove unwanted surface material from the planting location.

Figure 18.04
Shovel Screefing.

On a few contracts, especially in very dry desert-like regions in southern BC, you may be required to screef down to mineral soil before planting a tree. This is not common in most other parts of BC and throughout Canada.

Your instructor and your crew leaders will both demonstrate different ways to do this, and will monitor your screefing techniques to make sure you can get the minimum amount of work done

quickly and efficiently with minimum risk of long-term damage to your body. In general, boot screefing is faster and easier on your body. Shovel screefing is harder on the arms and shoulders, but does a better job. In tough grass mat, shovel screefing may be your only option. Screefing is not required on all contracts, and the size and depth of screefing requirements can also vary.

Figure 18.05
A Planter Screefing a Microsite.

On this block, the forester wants the trees planted deep in mineral soil, and the planters have been asked to remove the litter layer before planting.

Figure 18.06
Using the Boot to Screef a Microsite.

Boot screefing is easier than shovel screefing, although it doesn't work as well in tough grassy ground. Make sure you move your lower leg forward and backward, not side to side, or else you'll eventually do a lot of damage to your knee.

Obstacle Planting involves making use of stumps, slash, or other obstacles to protect seedlings from damage from things like cattle or snow.

Figure 18.07
Tree Planted Beside Obstacle.

This piece of slash will help protect the tree from wind, snowpress, and maybe even from getting stepped on by a cow.

Microsite Selection is important to maximize the potential growth of a seedling. You'll be expected to select microsites that minimize the impact of limiting factors and maximize seedling establishment and growth. For example, in some regions, you might be asked to plant trees in the bottom of

trenches, in order to take advantage of moisture in drought-prone areas. In other regions, you might be asked to plant trees at the hinge or higher in trenches, to take advantage of higher temperatures.

Density Specifications vary from contract to contract, and sometimes from block to block. For example, a forester might say that the spruce trees in one area have exhibited slightly higher mortality than pine in the past couple of years, so you might be told to plant spruce sections at a density of 1800 stems/Ha and pine sections at a density of 1600 stems/Ha. We'll talk about Density in much more detail in another section.

Quality Specifications also vary significantly from contract to contract, although quality expectations are generally very consistent on all blocks within a single contract. There's a common quality assessment system called the FS 704 system, which is in common use throughout much of British Columbia. Within that system, there can be variations. For example, on one contract, a forester may say that he/she would prefer to see all trees slightly deep, with pine trees a maximum of two fingers of dirt above the plug, and spruce trees even deeper with a maximum of four fingers of dirt above the plug. We'll talk about Quality in much more detail in another section.

Potential Non-Planting Components

Some seedlings are fertilized at the time of planting by having a "tea bag" package full of fertilizer buried in the ground a few inches away from the seedling. This happens especially where soil nutrients are limiting, or in areas where the cost to establish a seedling is so high that every possible growth advantage is worth the expense involved in providing the advantage. Trees are not commonly fertilized in northern BC, but it happens more frequently in the southern Interior, and it's very common on the coast. The best place for a tea-bag is usually about three inches from the seedling, ie. on the other side of the shovel hole, and buried just barely below the surface. You cannot let the tea-bag drop down into the shovel hole. You get paid extra for having to fertilize each tree. First-year planters don't typically work on jobs where fertilizing is necessary. Tea-bags are often called "ferts."

Figure 18.08
Fertilizer Tea-Bags.

Each of these small packages contains a tablespoon or so of fertilizer, and is buried in the ground beside each planted tree.

Browse Protection involves putting up structures or equipment to protect planted seedlings from being eaten by animals. Certain species, especially pine and cedar, are an appetizing snack for certain animals like deer and elk, and sometimes rabbits. Planters may be asked to put up three or four foot high "cones" over a freshly planted tree, which are then attached to a stake driven into the ground beside the tree to hold them in place. These cones are left in place for a few years until the tree has grown to the point where it's not very susceptible to damage anymore. Coning isn't a common activity for first-year planters to be involved in, since it's most commonly done on the coast, or on technically challenging ground in the Southern Interior. In those locations, the cost of planting a tree is so high that it's worthwhile to invest extra money in protecting the seedlings. In the northern Interior, it's easier just to plant a higher density of trees and assume that a few will get eaten.

Figure 18.09
Browse Protection Cone.

This type of browse protection is quite common. It's a three foot high cone, with a four foot high wooden stake holding it in place over top of a tree. These cones are quite common in high value areas such as BC's coast, where ungulates like to eat young seedlings (especially cedar).

Figure 18.10
Another Type of Browse Protection.

These cones in Alberta are made of mesh, rather than plastic.

Block Boundaries

For a first-year planter, knowing where the planting area ends and the forest begins is sometimes rather difficult. The exact boundaries can be vague. There won't be a fence or markers to guide you. The boundary will almost never be a straight line. It'll curve in and out, and you may have to interpret vague clues to determine if you've reached the end of the block yet.

Figure 18.11
Boundary Markings on a Confusing Block.

This entire area was hit by a wildfire. It's all standing timber, and it would be impossible for a planter to determine when they're past the block edge without some sort of help to guide them.

There are problems if you can't identify the block boundary properly. If you leave holes within a planting area, it increases the licensee's risk of non-compliance. If you plant outside of the unit boundaries, where there's no responsibility and perhaps no permission to plant, you'll waste energy and money. This is called a trespass. This may have a negative impact on your company's reputation, and can sometimes lead to a fine for your company.

Your crew leader or the forester will try to show you where the boundaries are located. Pay close attention. Often, there may be some sporadic symbols or markings to help guide the planters, such as old ribbon, paint, or rigid aluminum tags. In some cases, the edges of the blocks are extremely clear and obvious, and planters don't need help trying to figure out where the block boundary is located. In other cases, a forester will take the time to hang flagging tape every twenty feet or so, to help guide the planters.

Figure 18.12
Obvious Woodline for a Block Boundary.

Sometimes, it's quite easy to determine where the block boundaries end.

Block boundaries often follow natural features such as roads, timber edges, and creeks. Sometimes there's an adjacent piece that has also been cut but which is a different block, and it's very difficult to figure out the boundary. In those cases, it's expected that someone should put up a flag line of ribbon to help the planters stay inside the correct boundaries. Your crew leader should have good map-reading skills, and will probably be using a GPS or a geo-referenced map on a mobile device, to help ensure that the crew understands the block boundaries.

Figure 18.13
Assessing Boundaries with a GPS.

This checker is checking a GPS unit to confirm whether or not she's still within the block boundaries.

Mixing Species

Species mixes are common as they provide diversity and some protection from environmental concerns including global warming. They also help to protect against many forest health concerns including root rots, mistletoes, rusts, and beetles. You'll need to bag up with the appropriate species mix and know the best microsites for each individual species. For example, in wetter sites, spruce is more suitable than Douglas fir.

Figure 18.14
Mixed Stands are Usually Desirable.

Monoculture silviculture probably doesn't yield the best results. It's often a good idea to mix at least two main crop species, to maximize the chance of the plantation being reforested successfully.

Professional planters with many years of experience doing coastal planting are often faced with very complex and challenging species mixes on their pieces. Every planter's piece can also be slightly different on the coast. For example, one coastal piece might require a prescription that goes something like this:

> *"40% western red cedar, 30% western hemlock, 25% Douglas fir, and 5% Sitka spruce. The cedar must be the only species present in salal patches. The hemlock can be planted in pure organics, and can be mixed with cedar in mineral/organic areas. The Douglas fir can only be planted in areas of pure mineral soil, and only on the upper two-thirds of the piece. The spruce should be spread evenly throughout the lowest 20 meters of the piece in a mix with the cedar."*

When you're given specs like this, it can be confusing. However, a first-year planter in the Interior won't be faced with any prescriptions that are even remotely as complex as the example that I just gave. You'll probably be planting monocultures more often than not. A mix of pine and spruce is also fairly common, but at least that mix is only two species. Planting three species simultaneously would be relatively rare in northern BC.

When you have to plant a mix of pine and spruce, there will be two approaches. One is a percentage mix, and the other is a targeted mix. Even with a targeted mix your final result will still probably need to consist of specific percentages, but the difference in general is that a percentage mix is mixed consistently overall, whereas a targeted mix varies depending on which part of your piece you're planting at the moment. Let's go into more detail, because this is confusing. In these examples, I'm going to use a prescription for the block of 75% pine and 25% spruce. Furthermore, I'm going to say that for some reason, your specific piece actually has to meet those same requirements exactly.

In the Percentage Mix, you will need to plant 75% pine and 25% spruce everywhere in your piece. Let's say that your target density is eight trees per plot. I'll explain this in more detail in the section about density. Since 75% of eight trees is six, and 25% of eight trees is two, all of your plots should have six pine trees and two spruce trees each. The forester expects to see both species in every part of your piece, consistently, no matter where he/she walks. If you have a plot with five spruce and three pine, the forester will frown, because your ratio is incorrect. You can't get away with broad mixes, which is what would happen if you planted three boxes of straight pine on one side of the piece then planted a box of straight spruce on the other side. It needs to be mixed up on a really micro level. This type of approach is very common on blocks where the ground is homogenous and consistent, no matter where you are on the block.

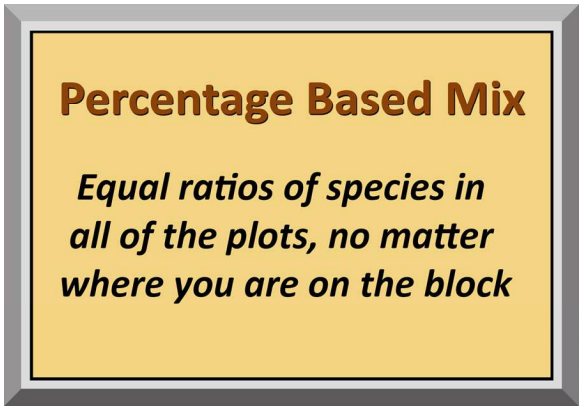

Figure 18.15
Percentage-Based Mixes.

Everything is mixed up equally, on all parts of the block.

In the Targeted Mix, the expectation is that your piece will have different types of microsites, and the forester will want you to prioritize the correct species for each individual microsite. So for example, if you have several gullies or low draws or swampy areas in your piece, you'll be expected to put spruce trees into all those areas. The pine will go everywhere else. Quite often, you'll still have to try to respect the overall mix (75% pine and 25% spruce), because that's how many trees got ordered. If 10% of the piece is wet and should definitely take spruce, and 10% is dry and should definitely take pine, and the other 80% could take either species, you'll want to put straight spruce into the wet

areas, straight pine in the dry areas, and the rest of your piece that can handle either species will get a mix containing the other 15% of the spruce and the other 65% of the pine.

Figure 18.16
Needles on a Pine Tree.

Target each species towards the areas where they will grow best. If there are parts of the block where each species are equally likely to survive, you can revert to a percentage-based mix.

On your first run, you might not know what you'll find, so you might take three quarters pine in your bags and one quarter spruce, and just pull out the proper trees as you go, depending on what you encounter. But you might discover on that first run that the entire right side of your piece is a swamp. So you might decide to take 100% spruce with you on your second and third runs, and get the swamp finished up first, so you're left with straight pine in drier ground for the rest of your bag-ups for the rest of the day. You might also decide to spread the pain out throughout the day, so you take mostly pine and a bit of spruce on each run, and just chip away at a bit of the swamp during each bag-up. Either approach is fine, so long as the end result is that you get the right trees in the right places.

Some foresters will tell you to use a combination of percentage mixing and targeted mixing. This is probably the best approach, and is fairly common. You, as a planter, get to do what makes the most sense to you. If you feel that the lowest quarter of your piece has the most moisture, you can plant all the spruce down there and tell the forester that's what you decided was best. If you think the moisture content is consistent throughout your piece, then you can just do a random percentage mix throughout your piece. So long as you can justify the rationale that you used to make your decisions, the forester will be happy. In other words, you'd end up doing what you think is best for the trees, without so many strict guidelines.

If you're still uncertain about what the best decisions are for picking spots for various species in your piece, ask your crew leader or trainer. He or she will be glad to help out.

For more photo and video resources associated with this chapter of the book, including a link to download some actual documentation used by silviculture foresters in western Canada, visit: www.replant.ca/training/prescriptions