

Lincoln County Forestry Supplement to *Guidelines for Forest Land Management Plan* (Wa DOR)

(Revised July 2002)

1. Application form prepared by Washington Department of Revenue (DOR) and provided by county assessor. RCW 84.33.130
2. Guidelines for Forest Land Management Plans written by WA DOR and provided with application form.
3. Lincoln County Forestry Supplement provided to help inform forestland stewards and make the process of writing a forestland management plan easier.

This document is intended to be a guide towards better informed forest stewards in Lincoln County and has no intention of being a comprehensive study of forestry. After reviewing these notes and comments you should be more comfortable with basic forestland management though you are advised to consult a professional forester. When applying for Timber Land tax status you are NOT required to seek professional assistance though you are expected to produce a well thought out forest management plan. This plan, as with all good plans, should clearly describe the current status, the management goals, and what you will do to achieve these goals. Please type your plan on a computer or typewriter if at all possible. If you cannot get access to this equipment, please be sure to print neatly.

How to describe a forest

A professional forester will have many special tools to quickly and accurately measure a forest. An alternative method is explained here that requires only tools common to most households. (This usually means a little bit more math but a calculator will take the work out of that.)

An individual tree is described using certain attributes: Species, Diameter, Height, Age, Growth, and percent live crown. (Sometimes health and defect)

Common commercial **species** in Lincoln County are ponderosa pine, Douglas-fir, western larch (a.k.a. tamarack), and lodge pole pine. Other species in the area, though not common in Lincoln County, are western white pine, western red cedar, subalpine fir, grand fir, Engelmann spruce, and western hemlock. Hardwood (not conifer) species include paper bark birch, quaking aspen, and black cottonwood. These are generally not considered commercial species in this area. They require more moisture and tend to grow in riparian areas (along streams) and in forested wetlands. An easy to use reference to help identify these (and many more) species is [Plants of Southern Interior British Columbia](#) (Parish, Coupe, Lloyd, 1996).

Diameter is the distance across the widest part of a circle (cross-section of the tree). Because there is a great deal of taper at the bottom (root collar) of a tree, diameter is NOT measured at ground level. The standard practice is to measure Diameter at Breast Height (DBH). This is defined as 4.5 feet above the ground. (This will provide a reasonable estimate of the diameter inside the bark at the large end of the first log and is

not as affected by taper.) A special measuring tape (called a D-Tape) is commonly used to measure the DBH. You may wrap a tape measure around the tree at breast height (horizontal to the ground) to determine the circumference of the tree. Divide this by PI (3.14159) to get the diameter. For example, you measure the circumference to be 37.7 inches. Divide this by 3.14159 and the result is 12 inches, the diameter of the tree.

Height is best measured by using a clinometer. This is also an expensive specialty tool. Doing without this is a bit cumbersome but certainly possible. In the mid morning or mid afternoon, find a tree that provides a shadow where you can see the tip of the shadow. Stand a yardstick straight up on the ground and measure the length of its shadow. Divide 36 (inches in a yard stick) by the length of the shadow (24 inches for example) and the result (1.5 in this case) is your multiplier. Now measure the length of the shadow of the tree (50 feet for example) and multiply by multiplier you just determined (1.5). This will give you the height of the tree (75 feet). Thought this is not as accurate as a forester might measure it is at least a good estimate. Rather than do this for many trees, you may wish to stand about 50 yards from your stand of trees and use this 75 foot tall tree as a guide stick to estimate the height of other trees in the stand.

Age and growth are normally determined using an increment borer. This is a somewhat expensive tool found in forestry suppliers catalogs. The only alternative to this is destructive sampling, cutting the tree down and counting the rings. This is not advised as the information can be difficult for untrained persons to interpret and trees are unnecessarily killed in the process. When properly interpreted, it is a good indicator of how healthy the stand is and what your rate of return on invest is. It also indicates what your next management activity should be.

Percent live crown is simply the proportion of the tree that has green leaves (needles). Usually that means a tree 80 feet tall that has green branches on the top 40 feet has 50% live crown. Sometimes the green branches are all on one side or not evenly distributed. In that case you need to imagine the tree with all the green branches pushed to the top to fill in the gaps and then estimate % live crown.

Common disease factors.

Dwarf mistletoe, Bark Beetle, Gall Rust, White pine blister rust, root rot, defoliators, etc. One of the best references for this is the US Forest Service. They have produced and maintain Forest Insect and Disease Leaflets (FIDLs) many of which are now available on the internet. (<http://www.na.fs.fed.us/spfo/pubs/fidlwest.htm>) A useful publication is the Field Guide to Diseases and Insect Pests of Idaho and Montana Forests by Susan Hagle, Scott Tunnock, Kenneth Gibson and Carma Gilligan. This is a US Forest Service publication, number R1-89-54.

Weed identification and control is an important part of forest management. The county weed board (725-3646) is available to provide publications and assist you in identifying weeds as well as recommending weed control measures.

Now that you have enough information to describe individual trees and other plant species present, you can summarize this to describe the forest. If you have very much land, you may wish to break your forested land into stands of timber. More importantly, if you have areas with distinctly different species compositions (areas of lodge pole pine as opposed to areas of ponderosa pine and Douglas-fir mix), or different terrain/aspect (gently rolling south slope versus steep north face) you will want to break them into different stands generally not less than 3 acres. Each stand should be described separately and plans individualized for them. Questions to answer when describing a stand of trees include: What is the overstory (tallest) species and how tall are they on the average? What species are the smaller trees and how tall? What species makes up the regeneration (seedlings)? What is the average diameter and range of diameters by species? Are there any disease components present? (ie Dwarf Mistletoe in the Douglas-fir and gall rust in the lodge pole pine.) How much brush is covering the ground? How tall is it and what species?

Spacing and Trees per Acres

To estimate how many trees you have, a 1/50th acre fixed radius sample plot is a good idea. Walk to a random location in the stand and place a stake in the ground to act as the plot center. Then count every tree within 16.7 feet of the stake. Multiply this by 50 to determine trees per acre. If you count 3 ponderosa pine and 4 Douglas-fir trees as well as 1 seedling, then you have 150 ponderosa pines per acre, 200 Douglas-fir per acre and 50 seedlings per acre. The total trees per acre is 350. (Seedlings are generally only considered when determining viable stems per acre as pertains to reforestation minimums.) Average spacing is 43560 (square feet in an acre) divided by 350 and then take the square root of that. $\text{Sqrt}(43560/350) = 11$ feet. One plot may not be representative of the whole stand so you should repeat this several times at random locations.

Describing the lay of the land.

How steep the land is can be expressed as a percent **slope**. This is just the rise over the run. 25% slope means that you gain/lose 25 feet of elevation for 100 feet traveled horizontally (not along the slope). The best way to accurately measure this without special tools is to use a long piece of string, a \$2 string level (at any hardware store), and a friend. Attach the end of the string to a tree an exact distance above the ground (6 feet for example). Stretch the string out so it is level and going directly up hill until the string touches the ground. Use the string level to keep the string horizontal. Measure the distance along the string from the tree to the ground to give you the horizontal distance. Just divide rise (6 feet) by run (50 feet for example) and multiply by 100%. $6 / 50 \times 100 = 12\%$ slope.

The **terrain** might be described as gently rolling hills or steep (what is the slope?) with small benches.

Aspect is the direction that hills face. Along the south bank of the Columbia River, the aspect is often North, Northeast or Northwest. This is important because species and growth

rates will be strongly affected by light and moisture availability. Slopes with a southerly aspect will tend to have a few ponderosa pines if any trees at all.

Mapping

A critical component to describing your forest is a map. A forest practices base map from the WA DNR is available for free. This is a good map to draw out your stands and parcel boundaries on. A USGS 7.5 minute topographic map is also a valuable mapping tool. The Lincoln County Planning and GIS Services can also provide you a basic map of your area at no cost. You should also include a copy of the map for your area from the Soil Survey with your parcel boundary drawn on it. This map will also help you identify what soil types you have. The soil descriptions will include important forestry information as well as other limitations for non-forestry activities.

Management Objectives

Virtually everyone wants a healthy and productive forest. Though this is a good goal, it is not specific enough to function as a management objective. Some objectives might include:

- Promote a diversity of species to lessen impact of disease hazards.
- Use multiple age groups as well as species to enhance a multilevel canopy providing better wildlife habitat and a more stable forest structure for multiple small harvest entries.
- Use single species, all of the same age, to maximize fiber or saw log production at the time of a clear cut X years from now.
- Minimize fire hazard by promoting an open park like stand of a fire resistant species.

This is only a small sample of what you might manage your land for. This should give you some ideas on how to describe your objectives. Management objectives for one stand frequently differ from those of an adjoining stand. The relatively dry climate of Lincoln County should always be strongly weighed in all management decisions, especially when choosing tree species and spacing. The dry climate makes it easy for fires to start. How to minimize fire damage is also an important management consideration. Fire tolerant species and limited ladder fuels are good ideas. The following photos and comments may help to illustrate what has been discussed here.



The photo above illustrates a well managed stand of ponderosa pine. Note the moderate to wide spacing without limbs near the ground where a ground fire could enter the crowns. No down logs directly against the standing trees where they could do more damage. A smoldering log contributes heat that penetrates the ground and bark to kill live tissue in the roots and the trunk. This often does more damage than a fast moving grass fire that does not produce heat long enough to penetrate the natural defenses of the tree.

This photo shows good seed tree retention after a harvest.



A very common problem is to allow too many seedlings to try and grow. More is NOT better. The photo below shows the proper stage to remove all but the healthiest saplings and leave them at a spacing of not less than 8–10 feet. The spacing of the trunks usually limits the width of the crowns





If excessive regeneration is not thinned and not destroyed by fire, you will probably end up with a stand like this. The regeneration is not producing any usable wood fiber, not very good wildlife habitat, and will probably be destroyed by fire taking the few merchantable trees with it. At this point, the only thing to do is remove all but the few viable seedlings/saplings and begin again. Many years have been lost to non-productive growth. There is the temptation to reserve some of the small trees that are still standing straight. This rarely works since they have an extreme height to diameter ratio that means it will most likely tip over when its neighbors are removed. The neighboring trees may be directly supporting it or just buffering it from the wind. These small suppressed trees almost always have very little live crown (Often less than 10%) to help them release if they are given light and water resources.



These very healthy Douglas-fir trees are a pleasure to see though they represent a problem. They are too closely spaced and not well distributed across the stand (bald spots). A good maximum crown width is about 30 feet which means in a mature stand the trees need to be 30 feet apart. Often this is achieved by starting with trees at 10-15 feet apart and then thinning them 1-2 times to achieve the correct spacing. These thinnings usually produce merchantable timber and a small profit as well as improve the forest health. Openings in the canopy are not always undesirable. Wildlife often like to forage on the grasses, shrubs and berries that grow in openings.



Ponderosa pine has thick, heat resistant bark when mature which makes it desirable in areas with frequent fire. Open grown ponderosa pine often has limbs growing all the way to the ground that should be pruned back. Always leave at least 30-40% live crown when pruning and do not damage the branch collars. Also note the shrubs growing directly under the tree. A fire will spread through the grass quickly and usually just blacken the bark of a ponderosa pine however in the case shown by the photo above, it will probably catch the shrub on fire and that will then help the bark to catch fire as well as lift the flames into the branches.

Forest Practices Rules

The Washington State Department of Natural Resources (509 684-7474, Colville) must be contacted if you wish to harvest timber. They can advise you on rules and regulations regarding forest practices. You may also refer to Washington Administrative Code 222 and the Revised Code of Washington 76.09. (Copies are available for free from the Dept. of Natural Resources.) Forest Practices Illustrated is a free publication from the Dept. of Natural Resources intended to help ordinary citizens understand these rule and regulations. You may also ask for a professional forester or wildlife biologist from the DNR to look at your forest with you and provide you with non-regulatory information. The DNR is also a good source for a 1:12000 scale Forest Practices base map (also free).

Fire Safe Homes

Many people are building their homes in or adjacent to forestlands. This creates the opportunity for serious loss due to fire. Burning trees lift the flames high helping to send embers onto homes. Burning trees may also be blown over in a firestorm, landing on nearby homes. These are a few things you can do to make your home more survivable.

- Regularly clean roof and gutters.
- Use fire resistant or non-combustible materials on the roof and outside of the house. Or treat wood or combustible material used in roofs, siding, decking, or trim with fire-retardant chemicals
- Create a 100-foot safety zone around your home by raking leaves, dead limbs, and twigs, and clearing all flammable vegetation
- Clear a 10-foot area around propane tanks and the barbecue
- Keep your access roads in good condition with an area to turn around at the end so fire trucks can access the fire



Steve Nesius / AP file

Note the lack of defensible space.

Naming Diameter Classes

Saw logs are usually greater than 7.5 inches DBH

Small saw is at least 5 inches DBH but smaller than Saw logs

Saplings are 0.5 inches DBH to small saw size

Seedlings are less than 0.5 inches DBH

Common units of land measurement

1 mile = 5280 feet = 80 chains = 320 rods

1 chain = 66 feet (= 100 links)

1 square mile = 640 acres

1 square chain = 1/10 acre (1 acre = 10 square chains or an area 1 chain by 10 chains)

1 acre = 43560 square feet

Contact Points

Washington State Department of Natural Resources	509 684-7474 225 South Silke Road Colville, WA 99114 (509) 685-5618 (fax) http://www.wa.gov/dnr/
Lincoln County Assessors Office	509 725-7011 450 Logan St, PO Box 400 Davenport, WA 99122
Lincoln County Planning and GIS Services	509 725-7041 (Jason Guthrie) 27234 SR 25 N Davenport, WA 99122
Natural Resource Conservation Service	509 725-4501 1310 Morgan Street Davenport, WA 99122
US Forest Services: Colville National Forest	509 684-7100
Washington Department of Revenue	800 548-8829 PO Box 47472 Olympia, WA 98504-7472 http://dor.wa.gov
Fire Wise	http://www.firewise.org/www/pubs_win.htm