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The Woodland Workbook

Stand Management

Growing and Harvesting Douglas-fir Poles

C. Landgren, M. Bondi, and W. Emmingham

Douglas-fir poles are a specialty forest product that can bring a premium price, yet many landowners do not know which trees qualify as poles or what they can do to manage stands for poles.

Most harvested poles grow naturally—with little or no interest on the part of the landowner to "grow poles." Under such conditions, 10 percent, at best, of the trees in a stand might qualify as poles. With management, you can increase this percentage—perhaps double or even triple it.

Chal Landgren, Extension agent, Columbia County; Mike Bondi, Extension agent, Clackamas County; and William Emmingham, Extension silviculture specialist; Oregon State University.

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Growing poles requires specific site and stand conditions and ready pole markets. Maximizing production involves periodic thinning during the life of a stand.

This publication is designed to help you decide whether your situation is suitable for pole management, and, if so, to help you manage your property for pole production. The information presented applies primarily to Douglas-fir stands in western Oregon and Washington.

What are poles?

Douglas-fir poles come from the best trees in a forest. To be classified a pole, a log must be straight and free of defect. Pole logs have few large knots, a uniform taper, and a minimum 1 inch of sapwood (Figure l). They range in length from 20 to 125 feet with 7- to 25-inch diameters.

The most frequently used pole characteristics are:

- *A pole is straight.* When you extend a straight line from the center of the top to the center of the butt, the line must not fall outside the body of the pole.
- *A pole is free of defect.* Poles are cut from live trees with no top, side, or butt rot allowed; surface scarring only is permitted.
- *A pole has few large knots.* No knot should be more than 3 inches across, and the total sum of knot diameters in any l-foot section should not be more than 8 inches. Trim all knots flush.
- *A pole must have adequate sapwood* (again, a minimum 1 inch is required on all poles).

You will find a complete list of pole specifications in Oregon State University Extension Service Circular 1127, *Measuring Timber Products Harvested from Your Woodland.* Requirements vary from one locality or buyer to another. Always consult prospective buyers for *their* specifications.

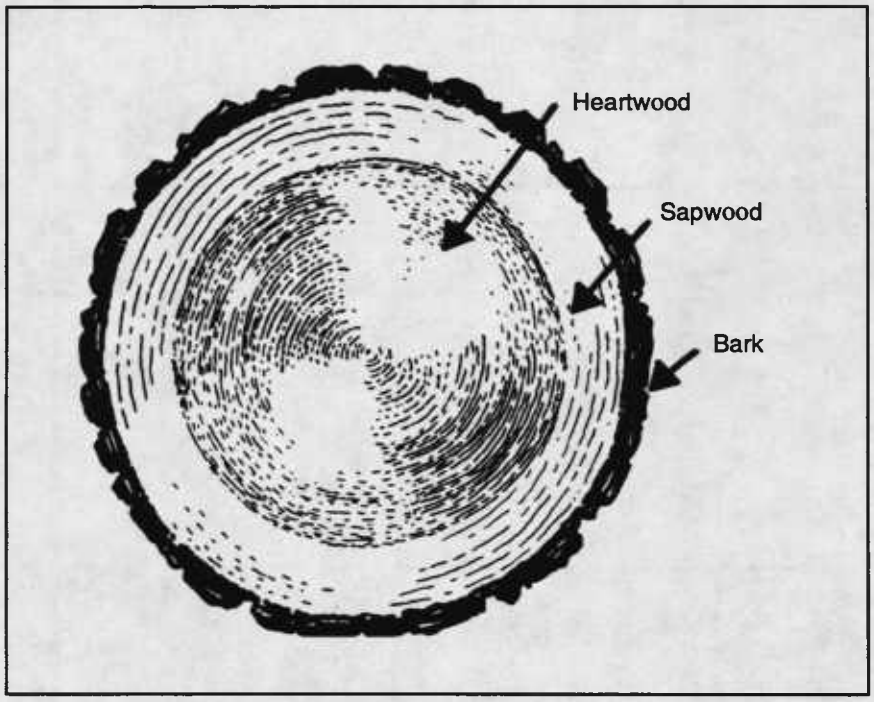

Figure 1.—Sapwood is the light colored wood just inside the bark.

Douglas-fir poles are used most often as telephone poles. They are divided into two broad classes—short, "distribution" poles that are 20 to 55 feet long and "transmission" poles that are 60 to 125 feet long. Though markets vary, there is usually a strong demand for the 40- to 45-foot and the 60- to 85-foot lengths.

Pilings have many of the same requirements as poles. However, because of the shock pilings undergo during driving, more exacting standards apply (a piling must be straighter than a pole). If there is a strong piling market in your area, compare prices at the marketing stage.

Is growing poles for you?

You must answer two questions before you start concentrating on pole production: Does my property have the correct combination of growing conditions, stocking, and markets? If these conditions are met, do the advantages of growing poles outweigh the disadvantages?

For successful pole management, your situation should meet most of the following conditions:

- Your property is site quality II or III for Douglas-fir (see "Site quality," page 3)
- Slopes are frequently less than 40 percent
- Stocking and stand conditions favor frequent Douglas-fir thinnings
- Contractors and operators skilled in logging and hauling poles are available

Advantages of growing poles

One major advantage is price. Prices fluctuate widely, however, depending on demand and supply. Always check competing market options for domestic and export saw logs for comparison.

In managing for pole production you are maintaining your stand at a stocking level close to the maximum, thus you are producing near maximum net wood yield. In growing poles, you also manage for the retention of high-value trees, leaving only the best, straightest, and most valuable trees.

Even if the pole market declines, you still have high-quality trees available for saw-log harvest.

Growing poles allows for product diversity—every stand managed for poles will also contain saw logs. This is doubly important. First, markets are often cyclical—there are times when pole prices remain high while those for saw logs drop (and vice versa).

Second, poles may allow small landowners with just a few trees to have a profitable logging operation. With saw logs, this may be more difficult, since the product price may be lower.

Disadvantages of growing poles

These include added effort and care—pole management takes time, equipment, and a skilled, dedicated manager. Also, in some areas, other product prices may be better than those for poles.

Landowners managing for poles must be willing to devote time and effort to precommercial and early commercial thinnings. Frequent light thinnings early in the life of a stand are only marginally profitable at best. In addition, such thinnings require a good understanding of tree biology and how trees respond to space and light.

Also, the logging equipment used in these thinnings must be maneuverable enough to move through the stand without damaging standing trees.

What sites are best?

The best areas for producing poles have good site quality, gentle slopes, and are free from climatic or environmental extremes.

Site quality

This is usually estimated by determining the relationship between tree height and age. The taller the tree for a given age, the higher the site quality. Baseline ages for comparing sites usually are established at tree ages of 50 or 100 years. Different factors—soil, climate, altitude—influence site quality.

Of the five site classes, sites II and III are considered ideal for growing poles because the trees tend to have the correct amount of taper and sapwood. High site lands (site I) tend to produce trees with little or no taper, and low sites (IV and V) may not produce adequate sapwood.

Slope

Slope has a major influence on thinning costs and therefore determines how intensively you manage for poles. For discussion purposes, four slope classes are useful:

1. *gentle:* less than 25 percent slope;
2. *moderate:* 25 to 40 percent slope;
3. *steep:* 40 to 60 percent slope; and
4. *very steep:* more than 60 percent slope.

Gentle slopes offer the best opportunity for intensive pole management. They are easy to log. Trees on *moderate* slopes are more expensive to log but can still be yarded with ground-based equipment. *Steep* slopes require cable yarding systems, which increase logging costs.

In addition, you cannot thin timber on moderate and steep slopes as profitably and as often as timber on gentle slopes because you must remove more timber volume at each thinning to offset high logging costs.

Very steep slopes are expensive to log and may be uneconomical to thin. It is not possible to manage for poles on very steep ground—you can only hope that the final harvest will have a high percentage of naturally developed poles.

Although the breaking point between slope classes may vary with different logging systems, increasing steepness will decrease the intensity of pole management.

Climatic extremes

Areas with extreme weather—high winds, heavy snow, and ice—are less likely to produce poles. Wind, snow, and ice can break the tops out of trees. If the trees grow new tops, they rarely meet pole specifications for straightness, uniform taper, and absence of sucker knots (Figure 2).

In Oregon, some areas that experience extreme weather conditions occur near Portland, where frequent ice storms break trees, and on exposed ridges and coastal locations where high winds are common.

Thinning for poles

If your woodland meets the site requirements mentioned earlier, you are ready to learn about thinning techniques used to promote pole growth. This will require an understanding of growth patterns and crown classification in tree stands as explained in *Thinning—An Important Timber Management Tool,* PNW 184.

Initial stocking and precommercial thinning

If you are planting a forest site, you have a chance to tailor the stand to your site conditions. On gentle and moderate slopes, a good target is 300-400 well-spaced trees per acre after about 10 years of tree growth. For very steep slopes, 200 well-spaced trees would be appropriate, because commercial thinning will not be feasible.

The number of trees to plant to meet your target depends on the amount of mortality expected on your site. About 400 trees per acre planted at 10-foot spacings is a common planting goal. If you get high survival or substantial natural fill-in on your sites, planting fewer trees is advisable.

If too many trees become established, a precommercial thinning should bring stocking down to the desired target level (about 300 trees per acre). The objective of precommercial thinning for poles, like all precommercial thinning, is to give healthy, well-formed trees room to grow.

Remove trees with double tops, crooks, or sweep. Try to space trees evenly, without leaving poorly formed or unhealthy trees.

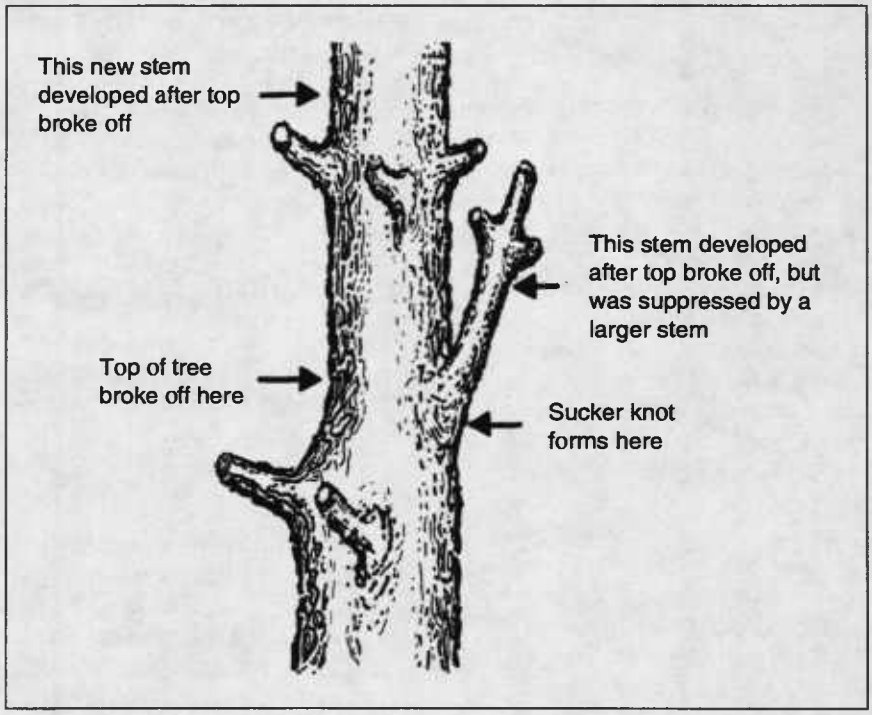

Figure 2.—Sucker knots develop after the top of a tree breaks out.

Commercial thinning

The objective of pole management is to manage the 300 or so trees per acre left after a precommercial thinning for the maximum percentage of poles. Natural stand development may produce as many as 10 percent, and skilled pole management may increase this to the 30 to 50 percent range.

In the first commercial thinning (at around stand age 25 to 30 years), remove some short poles and small saw logs. The objective of this and all future thinnings is to reduce between-tree competition and improve the remaining stand. Thus, *the percentage* of pole and high quality trees should increase with each thinning.

The first thinning might remove 3,000 to 5,000 board feet of material in trees with sucker knots, crooked boles, small crowns, and heavy limbs. Remove dead, suppressed, and intermediate trees along with excessively limby dominants. Cut pole-quality trees in the dominant and codominant crown classes if it will give surrounding pole-quality trees more room to grow.

Be careful not to create large 'holes" in the stand. A hole is a gap between tree crowns greater than about two crown widths, or one that will take longer than 10 years to fill in.

Considerable judgment is involved in making thinning decisions. It is important to realize there are various good ways to thin a stand, and different thinning combinations can accomplish similar desirable effects.

For instance, you might remove a pole-quality dominant tree if there are three to five adjacent dominant or codominant pole-quality trees that could use the growing space. Removing a dominant creates more growing

space than removing intermediate or suppressed trees. On the other hand, by removing several suppressed trees, you get the same effect that you would by removing one dominant.

It is important to leave trees that will qualify as poles within a few years. On site quality II and III, you can anticipate your first 70-foot poles at around a stand age of 40 to 50 years.

Stand renewal

Each thinning reduces the number of trees remaining in the stand and increases the percentage of high quality saw logs and poles. Depending on owner objectives, a clear-cut harvest most often is carried out when a stand is between 60 to 90 years old.

It is possible, however, to gradually remove poles and allow Douglas-fir or more tolerant species such as western hemlock or redcedar to fill the holes. This could lead to a stand with trees of various ages; a condition referred to as "uneven age. " Such stands are not easy to manage for poles.

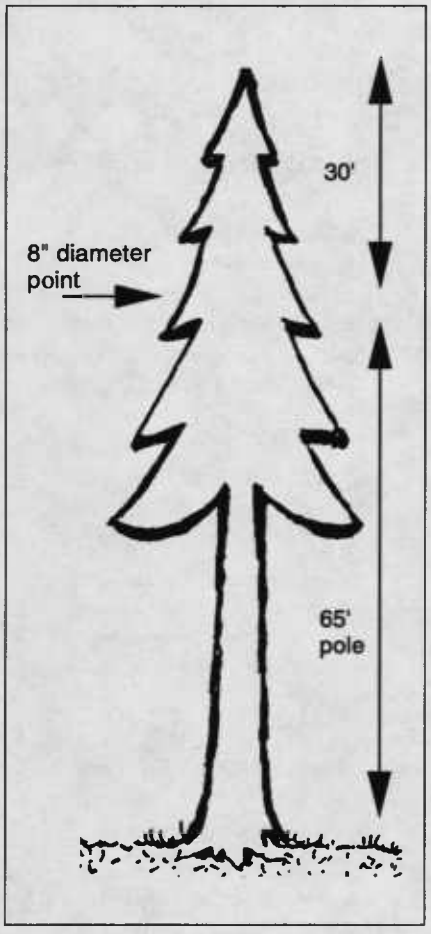

Figure 3.—Measure a few downed trees to determine the typical distance from the top of the tree to the top of the pole.

Harvesting and marketing Douglas-fir poles

Marketing

Before marking or cutting your stands, it is important to study pole price lists and compare specifications. It also is wise to meet with pole buyers and look over your stand with them.

Check the prices of other products such as export logs. You may find an even better market. (For information on export logs, see *Log Exports and the Nonindustrial Private Forest Owner,* EC 1141).

Measuring poles

Since there often are significant price differences among pole lengths and classes, it is important to inventory your trees before cutting. Nothing is more frustrating and costly than to cut a tree and find it is 2 feet short of being a more valuable pole.

Pole requirements usually specify a top diameter, a length, and a bottom diameter. It is difficult to determine the length of your poles to a specific top diameter before felling.

To aid your estimates, you may want to measure a few downed trees to determine the distance from the top of the tree to, for example, an 8-inch diameter point (the minimum top diameter allowed for your pole). (Specifications for top diameters range from 5 to 11 inches.)

Once you make a few of these measurements, you will have a rule of thumb for the taper of the trees in your area. For example, let's say your trees average 30 feet from the tree top to the 8-inch diameter (the top of the pole). With this information, you know that to get a pole 65 feet in length, your total tree height must be around 95 feet, or 65 plus 30 feet (Figure 3). (The top 30 feet, which measures less than 8 inches, becomes low-value logs.)

Contracting

The method of contracting for pole logging may differ from that used in saw logs. You must consider the extra time needed to log poles and the added value of the product. In the contract, specify separate amounts for logging poles and for logging saw logs. Many of the pole buying firms can also recommend contractors and truckers familiar with the requirements of logging poles.

Payment for the logging of poles within a stand is handled in a variety of ways. Sometimes pole harvest is a separate harvest from saw logs. Sometimes both are done at the same time. Either method will work.

It is important to be clear ahead of time on the scaling method to use in determining the value of poles, as many companies buy on a per-linear-foot rather than a per-thousand-board-foot basis. Again, inventory and careful marking of poles and saw logs is important in obtaining full value from your stands.

Logging pole stands

Costs of logging distribution sized poles may be 4 to 10 percent higher than logging saw logs. Logging costs for transmission poles may run 15 to 20 percent higher than saw logs.

Skill is required to fell poles without breakage. Often old stumps, hidden by brush and debris, break poles. To minimize this damage, it is a good practice in early thinnings to cut all stumps as close to the ground as possible.

If you hire the logging work, and most landowners do, make sure whoever you hire is experienced in logging poles. Local pole buyers often can refer you to good pole loggers.

The time you choose to log may be more important for poles than saw logs. Late summer is a good time for felling poles because it follows completion of the current year's top growth.

This allows the pole, which may be slightly undersized in May, to grow into a larger class by August. This is important—a 65-foot pole could easily be 1 ½ times more valuable than a 60-foot pole.

Fall and winter also are good logging times because the sap is "down" and the bark is tight. At this time of year, damage caused by tree felling, skidding, and traffic in and out of the area may not be as harmful to the remaining trees.

When the sap is "up" in the spring, nicks and scrapes can easily knock off bark. This can slow tree growth, and the scarring can eliminate trees from pole consideration.

To reduce tree breakage, poles frequently are felled uphill, shortening their falling distance. Also, trees often are felled into the branches of other trees to cushion the fall. Lower value trees often are selected to act as "cushion trees."

Design landings and roads to accommodate longer poles and the specialized equipment needed to handle them. On landings, long poles are difficult to reposition once they are decked. Therefore, it is important to deck poles in the manner prescribed by the pole buyer.

With long poles, decking is usually done so the butt of the log points in the direction the log truck will depart. Short poles (50 feet and less) are often mixed for more even loading.

Shove and move poles as little as possible to avoid deep scarring. If you must move poles, it may help to pad the equipment blade with dirt so bark isn't scraped off the poles.

Poles shorter than 55 feet can be loaded on normal log trucks— longer poles require specialized pole trucks. Road curves, grades, and gates must be wide enough to accommodate longer trucks.

Summary

Managing your woodland for production of Douglas-fir poles requires several conditions: Your land should be site II or III for Douglas-fir, it must not be too steep for profitable, repeated thinnings, and climatic extremes should be rare. And, most importantly, you must be willing to take the extra time and care needed to get the most from your forest stands.

Finally, it is important to remember that growing poles does not disallow the use of your trees for other products such as saw logs. Stand management for pole production is simply one method of maximizing your production with a particular product goal in mind.

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Emmingham, W. *Thinning—An Important Timber Management Tool*, PNW 184 (Corvallis: Oregon State University, reprinted 1992). $1.00.

Oester, P. *Measuring Timber Products Harvested from Your Woodland*, EC 1127 (Corvallis: Oregon State University, reprinted 1992). $2.00.

The Woodland Workbook is a collection of publications prepared by the Oregon State University Extension Service specifically for owners and managers of private, nonindustrial woodlands. The Workbook is organized into separate sections, containing information of long-range and day-to-day value for anyone interested in wise management, conservation, and use of woodland properties. It's available in a 3-ring binder with tabbed dividers for each section.

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